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REMEDIAL ACTION WORKPLAN

For:

28-34 Pearl Street Site
28-34 Pearl Street
Port Chester, New York
NYSDEC BCP Site # C360214

Prepared for:

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181 Westchester Ave. #301A
Port Chester, New York 10573

Prior Submissions:

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Prepared for:

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c/o Six Acre Capital

SESI Project No:
12123A

Date:
April 22, 2026

CERTIFICATIONS

“I, Fuad Dahan, PE, certify that I am currently a NYS registered professional engineer or Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.”



NYS Professional Engineer (# 090531)	4/22/2026 Date	 Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law

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LIST OF ACRONYMS

Acronym	Definition
ACM	Asbestos-containing Material
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CPP	Citizens Participation Plan
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
cy	Cubic yard
DER	Division of Environmental Remediation
DER-10	NYSDEC Technical Guidance for Site Investigation & Remediation
ECs	Engineering Controls
EE	Environmental Easement
ESA	Environmental Site Assessment
FER	Final Engineering Report
ft-bgs	feet below ground surface
HASP	Health and Safety Plan
ICs	Institutional Controls
ISCO	In Situ Chemical Oxidation
LBP	Lead-based Paint
LNAPL	Light Non-Aqueous Phase Liquid
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORC	Oxygen Releasing Compound
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PDI	Pre-Design Investigation
PFAS	Per and Polyfluoroalkyl Substances
PGSCO	Protection of Groundwater Soil Cleanup Objectives

Acronym	Definition
PHC	Petroleum Hydrocarbon Compound
PPE	Personal Protective Equipment
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RSCO	Residential Soil Cleanup Objective
RRSCO	Restricted Residential Soil Cleanup Objectives
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SESI	SESI Consulting Engineers, DPC
SESC	Soil Erosion and Sediment Control
SMP	Site Management Plan
SOE	Support of Excavation
SoMP	Soil/Materials Management Plan
SSDS	Sub-slab Depressurization System
SWPPP	Stormwater Pollution Prevention Plan
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TOGS	Technical and Operations Guidance Series
UUSCO	Unrestricted Use Soil Cleanup Objectives
UST	Underground Storage Tank
VI	Vapor Intrusion
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

The NYSDEC entered into a Brownfield Cleanup Agreement (BCA) with 28 Pearl Street Development LLC, a Volunteer, for the property known as 28-34 Pearl Street Site (BCP No. C360214) ("Site"), on September 28, 2021, before the Volunteer acquired the Site. The BCA was amended on May 6, 2022, when the Volunteer acquired the Site. A Site Location Map is presented as **Figure 1.1**.

This Remedial Action Work Plan (RAWP) presents the data and findings from the remedial investigation and includes an analysis of the potential remedial actions to address the contamination as determined during the Remedial Investigation. Based on the analysis of the remedial investigation data, a Track 1 remedy has been selected by the Volunteer as the preferred remedial alternative. This RAWP will detail the actions to achieve a Track 1 remedy.

Even though a Track 1 remedy has been selected by the Volunteer as the preferred remedial alternative, to the extent this most stringent remedy cannot be achieved, this RAWP will also include an analysis of a Track 2 remedy as a contingency if the Track 1 is not achieved.

1.1 SITE LOCATION AND DESCRIPTION

The Site consists of two (2) contiguous parcels totaling 0.45 acres of land identified on the Westchester County Assessors map as tax lots 142.30-1.84 (28 Pearl Street) and 142.30-1.83 (34 Pearl Street). The 28 Pearl Street portion of the Site was formerly improved with a 3,240-square-foot single-story building that was demolished between 2022 and 2023. The building was previously occupied by a small engine repair and an automobile repair shop. The 34 Pearl Street portion of the Site was formerly improved with a 1,774-square-foot two (2)-story single-family dwelling that was demolished between 2022 and 2023. A Subject Property Plan is shown on **Figure 1.2**.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed redevelopment of the Site includes the construction of a building that will include commercial, retail and residential uses. The planned redevelopment of the Site consists of 140 residential units with approximately 14,000 square feet of lobby, leasing, amenities and mechanical on the first floor. The Property will also include 90 residential garage parking spaces.

The footprint of the proposed development is presented as **Figure 1.3** and conceptual redevelopment plans are included as **Appendix A.**

1.3 SITE HISTORY

The following environmental reports were submitted with the BCA application and are summarized below:

- Phase I Environmental Assessment (ESA) Report for 28–34 Pearl Street, Port Chester, New York, Prepared by HydroEnvironmental Solutions, Inc., dated August 4, 2020;
- Phase II ESA Report for 28–34 Pearl Street, Port Chester, New York, NYSDEC Spill No. 2003263, prepared by HydroEnvironmental Solutions, Inc., dated August 11, 2020;
- Remedial Investigation Report for 28–34 Pearl Street, Port Chester, New York, Prepared by SESI Consulting Engineers, dated September 2022; and,
- Remedial Investigation Report for 28–34 Pearl Street, Port Chester, New York, Prepared by SESI Consulting Engineers, dated December 2025.

<u>AUGUST 2020 PHASE I ENVIRONMENTAL ASSESSMENT (ESA) REPORT</u>

HES prepared a Phase I ESA for 28–34 Pearl Street, Port Chester, New York, in August 2020. The Phase I ESA identified the following RECs and HREC, as follows:

- REC 1 – Former USTs: Former USTs and pump islands related to the former use of 28 Pearl Street as a fueling station. According to the Site owner, six (6) 2,000-gallon USTs and the pump islands that formerly serviced the fueling station were removed under the supervision of the Village of Port Chester approximately 20 years ago. This was confirmed by records obtained in the EDR search. However, the potential for undocumented leaks related to the former pump islands and six (6) USTs are a potential source for contamination of the subsurface soil and groundwater, making the Site's former use a potential REC;
- REC-2: Floor Drains: Floor drains located inside the small engine repair shop and automotive repair shop at 28 Pearl Street. According to the Site owner and operator of the small engine repair shop, Mr. Gianfrancesco, some floor drains were connected to an oil-water separator that fed to the waste oil tank, while others discharged to possible dry

wells. Although the floor drains appeared to be in good condition, the potential for petroleum products and hazardous chemicals to leak from floor drain piping or a failure of the oil-water separator presents the potential for subsurface contamination;

- REC-3: ASTs: The three (3) ASTs are located behind the building at 28 Pearl Street. Observations of the ASTs indicated potential for corrosion at the base of the tanks due to their proximity to moist vegetated soils below the base of the tank. Each of these conditions may lead to or may have led to leaks from the ASTs; and,
- HREC-1: Historical auto Site and former gas station. The target Site is a historical auto site and was a former gas station dating back to 1968, which is evident in the records search, as well as in the six (6) removed gasoline and diesel USTs, where the former island was located. For these reasons, this is considered an HREC.

AUGUST 2020 PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT

HES conducted a Phase II ESA in August 2020 for investigation of the RECs and HREC identified in the Phase I ESA. The investigation included the following activities:

- Drilling and sampling of seven (7) soil borings:
  - Seven (7) samples analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs);
  - Four (4) samples analyzed for TAL metals; and
  - One (1) sample analyzed for PCBs.
- Installation and sampling of two (2) temporary groundwater monitoring wells:
  - Two (2) samples analyzed for VOCs and SVOCs.
- Installation and sampling of four (4) shallow vapor points:
  - Four (4) samples analyzed for VOCs.

HES reviewed the data and concluded the following:

- Based on photoionization detector field screening and the laboratory results of the soil samples collected at the B-6 and B-7 boring locations, detrimental impacts to soil quality were present due to the past bulk storage of petroleum hydrocarbons at the Site, and historical commercial use.
- Concentrations of metals, including lead ranging from 58.2 mg/kg in sample B-3 to 526 mg/kg in sample B6 (0-2 ft-bgs), nickel at 39.5 mg/kg in sample B-3, zinc ranging from

126 mg/kg in sample B-4 to 1390 mg/kg in sample B-6(0-2 ft-bgs) were indications that historical use at the Site impacted the soil adversely. In addition, there were several VOCs that exceeded their respective UUSCOs in these borings, which was deemed an indication that the bulk storage of petroleum hydrocarbons impacted the soil beneath the Site.

- Based on the laboratory results of the groundwater samples collected from temporary monitoring wells installed at the B-2 TW, and B-3 TW boreholes, several VOCs (i.e., benzene, methylene chloride, 1,2,4-trimethylbenzene, etc.) were detected at levels significantly above their respective NYSDEC AWQS. This indicated that there have been substantial impacts to the groundwater from the former use of the Site as a gas station.
- Based on laboratory analytical results for the shallow soil vapor points installed on Site, there were significant impacts to the soil vapor noted, specifically at VP-2 and VP-3, resulting in an increased a risk of vapor entry into the basement of the proposed commercial/residential building.

NOVEMBER 2021 REMEDIAL INVESTIGATION WORKPLAN

SESI prepared an initial Remedial Investigation Workplan (RIWP) in November 2021 for investigation of the RECs and HREC identified in the August 2020 Phase I ESA.

DECEMBER 2021 REMEDIAL INVESTIGATION WORKPLAN

SESI prepared a revised RIWP in December 2021 to address comments issued in December 2021 for the initial November 2021 RIWP. The RIWP was approved on February 7, 2022.

SEPTEMBER 2022 REMEDIAL INVESTIGATION REPORT

SESI conducted an initial Remedial Investigation in 2022 for investigation of the RECs and HREC identified in the August 2020 Phase I ESA. The 2022 RIR was submitted to the NYSDEC in September 2022. The Site was then temporarily used as a staging area to facilitate the remediation of the Grand Union Hotel Bowling Alley BCP Site No. C360222 (Grand Union Site) since there was no room on the Grand Union Site to stage equipment. A change of use notice advised the New York State Department of Environmental Conservation (“NYSDEC”) of the temporary parking use on this Site and that the paving will not impact the planned Remedial Investigation (“RI”) and the development of a proposed Remedial Action Work Plan (“RAWP”) on

the Pearl Street Site since the RI work could be performed through the temporary pavement over system, which was accomplished.

JUNE 2025 REMEDIAL INVESTIGATION REPORT

SESI conducted a supplemental Remedial Investigation from January through April 2025 to address the comments the NYSDEC provided in November 2022 for the initial September 2022 RIR. The 2025 RIR was submitted to the NYSDEC in June 2025.

DECEMBER 2025 REMEDIAL INVESTIGATION REPORT

SESI conducted a supplemental Remedial Investigation in October and November 2025 to address the comments the NYSDEC provided in August 2025, which are addressed in the final revised December 2025 RIR.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The remedial investigation at the Site was conducted to determine the nature and extent of on-Site contamination for all media and provide that data required to determine an appropriate remedial action for the Site.

2.1 SUMMARY OF SOIL REMEDIAL INVESTIGATION FINDINGS

Soil impacted with metals were detected at concentrations exceeding the UUSCOs and RRSCOs to depths of 15 ft-bgs across the Site; petroleum hydrocarbon compounds (PHC) VOCs and SVOCs were detected at concentrations exceeding the UUSCOs and RRSCOs to depths of 9.5 ft-bgs or top of bedrock in the northern and eastern portion of the Site; pesticides were detected at concentrations exceeding the UUSCOs across the Site to a depth of 15 ft-bgs (however, the concentrations may be due to laboratory contamination); PCBs were detected at concentrations exceeding the UUSCOs in two (2) surface samples at either end of the Site near the Site boundary; and PFOS exceedances across the Site extend to a depth of 5 ft-bgs. The sampling location plan and contaminant distribution in soil are presented in **Figures 2.1** and **Figure 2.2,** respectively.

2.2 SUMMARY OF GROUNDWATER REMEDIAL INVESTIGATION FINDINGS

From March 2022 through February 2025, a total of nine (9) monitoring wells (RI-MW-1, RI-MW-2, RI-MW-3, RI-MW-4, MW-4A, RI-MW-5, RI-MW-6, MW-6A and MW-RISV4) were installed to investigate groundwater across the Site. In March 2022, January 2025 and April 2025, seven (7) of the monitoring wells (RI-MW-1, RI-MW-2, RI-MW-3, RI-MW-5, MW-4A, MW-6A and MW-RISV4) were sampled for TCL/TAL+30 (including VOCs, SVOCs, PCBs, pesticides, and metals), PFAS, and 1,4-dioxane. Due to dry conditions, groundwater samples were not collected from wells RI-MW-4 and RI-MW-6. These wells were reinstalled in February 2025 as RI-MW-4A and RI-MW-6A, respectively, and sampled during the April 2025 event.

Groundwater sampling indicated that groundwater at the Site is impacted by VOCs, SVOCs, metals, pesticides and PFOA and PFOS at concentrations exceeding the Ambient Water Quality Standards (AWQS). The groundwater sample locations and concentrations are presented on **Figures 2.3A and 2.3B.**

2.3 SUMMARY OF SOIL VAPOR REMEDIAL INVESTIGATION FINDINGS

Numerous VOCs were detected in soil vapor across the Site. NYSDEC does not have standards for soil vapor, but detections for sub-slab soil vapor samples were compared to the New York State Department of Health (NYSDOH) Decision Matrices A through F. Direct comparison to the NYSDOH Decision Matrices cannot be made without indoor air data; however, the sub-slab vapor screening levels were used for comparison purposes. When compared to the NYSDOH Decision Matrices A through F lower thresholds, 2,2,4-trimethylpentane, benzene, cyclohexane, heptane, hexane and methylene chloride were detected in one or more samples at concentrations exceeding their respective screening levels. Concentrations of 2,2,4-trimethylpentane, benzene, cyclohexane, heptane, hexane and methylene chloride triggers an assessment using the NYSDOH Decision Matrix A though F upper thresholds. The soil vapor sample locations and concentrations are presented in **Figure 2.4.**

2.4 GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

Regional surface topography slopes downward to the east/northeast direction. According to the United States Geological Survey topographic map, the Site's average topographic elevation is approximately 57 feet above mean sea level (msl). Based on the SESI 2022 and 2025 RI subsurface investigations and SESI's 2022 geotechnical investigation, the stratigraphy of the Site, from the surface down, typically consists of six (6) to eight (8) inches of asphalt or concrete underlain by fill materials followed by uncontrolled fill material consisting of red-brown/brown/gray silt with varying amounts of coarse to fine sand and gravel and coarse to fine sand with varying amounts of silt and coarse to fine gravel, identified to be glacial till to depths extending up to 20 ft-bgs. Intermixed in the glacial till was fill material consisting of gravel, wood, and metal debris. Bedrock consisted of white/dark gray moderately weathered, steeply dipping, weak gneiss with mica, hornblende, and feldspar and was typically encountered at depths ranging from 8 to 20 ft-bgs.

Groundwater was encountered during the 2022 and 2025 RI and SESI's 2022 geotechnical investigation at depths ranging from approximately 7.5 to 11.5 ft-bgs. A monitoring well survey was not completed prior to the date of this report; however, based on the depth of water measurements collected from the monitoring wells installed at the Site, in conjunction with the topographic gradient, groundwater flow is inferred to be in the easterly direction. However, it

should be noted that local groundwater flow direction can be affected by subsurface openings or obstructions such as basements and utilities, groundwater pumping and other factors.

2.5 CONCEPTUAL SITE MODEL

The following subsections present the conceptual site model for the Site and discuss the potential sources of contamination, types of contaminants and affected media, potential contaminant pathways and actual/potential human and environmental receptors.

As reported in the Phase I and Phase II ESAs prepared to the Site, the suspected sources of discharge at the Site are primarily related to historical Site operations and underground and above ground storage tanks. The Site's former use as a fueling stations, and the associated USTs, are likely sources of discharges at the Site. Dry wells that were potentially connected to floor drains in a former engine repair shop also present a potential source of impacts to the environment. Finally, the presence of ASTs on the Site also represents a potential source of contamination at the Site.

The overall depth of impacted soils ranged from grade to 15 ft-bgs. PHC, VOC and SVOC impacts exceeding both UUSCO and RRSCOs were identified in soils along the northeastern portion of the Site. Metals contaminated soils exceeding the UUSCO and RRSCO extended from grade to 15 ft-bgs and were ubiquitous throughout the Site. It should be noted that, while detected at concentrations exceeding UUSCOs, nickel and copper appear to be naturally occurring due to their limited range of concentration, varied distribution, and lack of correlation with areas containing high concentrations of lead and mercury. PCBs exceeding the UUSCOs were identified in two (2) isolated areas of the Site. Migration pathways include soil exiting the site in the form of dust and surface water runoff. Receptors include humans coming in direct contact with soil.

The Site's groundwater has been impacted with VOCs, SVOCs, metals, Pesticides and PFOS compounds above NYSDEC TOGS AWQS groundwater standards. PFOS was detected in monitoring wells MW-1, MW-3 and MW-5, and metals were detected along the southeastern and northwestern portion of the Site. Monitoring wells RI-MW-1 through RI-MW-6 were surveyed by Line and Grade in January 2025. A groundwater contour map based on gauging data collected

during March 2022 is included as **Figure 2.5**. Based on the gauging data, the Site groundwater table ranges between approximately 7.45 (MW-3) ft-bgs and 11.3 (RI-MW-6) ft-bgs and is expected to flow to the northeast. Because groundwater in this area of Port Chester is not used for potable water, the pathway of the contaminated groundwater to human receptors is limited to the ingestion of the groundwater or direct exposure through excavation work. Further, because the nearest surface water is approximately 1,500 feet to the East (Byram River), impacted Site groundwater is not expected to have a pathway to an ecological receptor.

Finally, the PHC VOCs and CVOCs detected in soil vapor can result in soil vapor intrusion into the future on-Site building. In addition, there is the potential for off-Site SVI migration to nearby buildings. To address the potential for these pathways to human receptors, and because the foundation will be in the groundwater table, a vapor barrier will be installed under the foundation and up the side walls in order to prevent vapor intrusion off-site. The is no pathway into the future on-Site building due to a one (1) story open air garage between the foundation and the living residential floors of the building. An audit of the soil vapor barrier during installation will be performed to ensure the installation will properly serve as a soil vapor intrusion barrier to prevent off-site migration.

2.6 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE

The following standards and criteria typically will apply to Site Characterizations, Remedial Investigations, remedy selection, underground storage tank closures, remedial actions and Site management activities:

- DER-10 / Technical Guidance for Site Investigation and Remediation
- DER-13 / Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York State Department of Environmental Conservation
- 6 NYCRR Part 257 - Air Quality Standards
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004, 2023)
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (October 1994)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006; amended May 2017; February 2024)

- 6 NYCRR Part 375 - Regulations Subparts 1, 3 and 6 applicable to the Brownfield Cleanup Program (Amended December 31, 2025)
- Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guidebook (June 1998)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.047FS Presumptive Remedies: Policy and Procedures (September 1993)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.048FS Presumptive Remedies
- Site Characterization and Technology Selection for CERCLA sites with Volatile Organic Compounds in Soils (September 1993)
- 6 NYCRR Part 612 - Registration of Petroleum Storage Facilities (February 1992)
- 6 NYCRR Part 613 - Handling and Storage of Petroleum (February 1992)
- 6 NYCRR Part 614 - Standards for New and Substantially Modified Petroleum Storage Tanks (February 1992)
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil (November 1998)
- 6 NYCRR 375 Table 375-6.8(a) and Table 375-6.8(b) (Amended December 31, 2025)
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- 40 CFR Part 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy
- STARS #2 - Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects
- SPOTS #14 - Site Assessments at Bulk Storage Facilities (August 1994)
- Spill Response Guidance Manual
- Permanent Closure of Petroleum Storage Tanks (July 1988)
- NYSDOH Environmental Health Manual CSFP-530 - "Individual Water Supplies - Activated Carbon Treatment Systems"
- 10 NYCRR Part 67 – Lead
- 12 NYCRR Part 56 - Industrial Code Rule 56 (Asbestos)

- 6 NYCRR Part 175 - Special Licenses and Permits--Definitions and Uniform Procedures
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (November 1998)
- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (November 1998)
- 6 NYCRR Subpart 374-3 - Standards for Universal Waste (November 1998)
- TAGM 4013 - Emergency Hazardous Waste Drum Removal/ Surficial Cleanup Procedures (March 1996)
- TAGM 4059 - Making Changes to Selected Remedies (May 1998)
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works
- OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (November 1997)
- CP-43: Groundwater Monitoring Well Decommissioning Policy (November 2009)
- NYSDEC Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances Guidance Document (latest draft April 2023).
- Green and Sustainable Remediation Guidance and DER 31: Green Remediation
- 6 NYCRR PART 375 - Environmental Remediation Programs (Effective December 31, 2025)

2.7 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.7.1 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This exposure assessment discusses potential migration routes by which chemicals in the environment may be able to reach human receptors in accordance with NYSDEC DER-10 sections 3.14(c)17, 3.3(c)4 and Appendix 3B. This discussion is based on current and hypothetical future Site conditions and addresses the following four (4) points:

- identifies areas of concern and chemicals of concern;
- evaluates actual or potential exposure pathways;
- characterizes the potentially exposed receptors (residents, workers, recreational users, etc.), and
- identifies how any unacceptable exposures might be eliminated/mitigated.

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- identifies how any unacceptable exposures might be eliminated/mitigated.

2.7.1.1 AREAS OF CONCERN AND CHEMICALS OF CONCERN

Findings from the remedial investigation at the Site indicate:

- PHC VOC and SVOC impacts in soils exceeding both applicable UUSCOs and RSCOs along the northeastern portion of the Site to depths of approximately 9.5 ft-bgs. Metals exceeding the applicable UUSCOs and RSCOs throughout the Site to depths of approximately 15 ft-bgs, PCBs in surface soils exceeding the UUSCOs in two (2) isolated areas.
- Site groundwater has been impacted with VOCs, SVOCs, metals and slightly impacted by PFAS compounds. All wells on Site were found to be impacted with a mix of compounds above the AWQS.
- PHC VOCs and CVOCs have been detected in soil vapor. Concentrations of 2,2,4-trimethylpentane, benzene, cyclohexane, heptane, hexane and methylene chloride trigger a mitigation monitoring assessment using the NYSDOH Decision Matrix A though F upper thresholds.

2.7.1.2 ACTUAL AND POTENTIAL EXPOSURE PATHWAYS

The five (5) elements that comprise an exposure pathway include:

1. A description of the contaminant source. If the original source is unknown, then a description of the contaminated environmental medium at the point of exposure;
2. An explanation of the transport mechanism;
3. An identification of all potential exposure points;

4. A description of the exposure route at the contact point; and
5. A receptor population.

As noted in the CSM, the contaminant source is past operations and underground and aboveground storage tanks at the Site. Transport mechanisms, exposure routes and contact points, and potential receptors for each medium are discussed below.

Soil

Impacted soils can potentially be transported from the Site through dust, surface water and sediment runoff, and leaching to the groundwater. Dust and direct contact create potential exposure points to human receptors through inhalation, ingestion and dermal contact during demolition and construction activities as well as unauthorized access to the Site. Surface water and sediment runoff create potential exposure to surface water and other ecological receptors, and leaching to groundwater creates a pathway to potential users of groundwater.

Groundwater

Contamination in groundwater can be transported via groundwater flow or inhalation of vapors. The primary exposure points for human receptor points to impacted groundwater are direct ingestion of groundwater if used as a potable source of drinking water (which is not the case at this site) or adsorption during excavation work. Migration of groundwater to surface water, wetlands or other ecological receptors also represents a potential exposure point when the site is located near these receptors (which is not the case at this site).

Surface Water and Sediment

Surface water is not present on the Site. Thus, this exposure pathway may be eliminated from further evaluation.

Soil Vapor and Indoor Air

The potential for vapor contamination to migrate exists whenever near contaminants volatize, and this is enhanced during intrusive activities such as demolition and excavation. The exposure route for soil vapor is through the inhalation of the contaminated soil vapor during intrusive construction activities or when vapors intrude into the enclosed spaces of any planned Site development. After the Site is redeveloped, a potential that vapors could accumulate in enclosed

areas of the proposed building, such as basements, crawl spaces, first floors, etc. create potential exposure points if not mitigated.

2.7.1.3 ELIMINATION OR MITIGATION OF UNACCEPTABLE EXPOSURES

The following sections set forth measures to be undertaken to eliminate or mitigate the potential risks of exposure for each medium. The remedies to be employed to reduce/eliminate the exposure risks are detailed in the following sections.

Soil

At present, potential exposure points have been eliminated by restricting public access to the exposure through fencing and paving. 34 Pearl Street parcel is fenced off and public access is restricted. While the 28 Pearl Street parcel is unfenced and used as parking, it is paved with asphalt and prevents exposure to soil. Additionally, the Site is presently vacant other than parking vehicles and does not support any other site activities. During future construction activities, specifically disturbance of soils, the potential for exposures to soils would increase for on-Site workers, utility workers, visitors and trespassers, as well as disturbed soils migrating offsite. These risks will be mitigated by employing the proper personal protective equipment (PPE), implementing the HASP and CAMP, preventing dust generation and implementing Site security to restrict access and managing soil runoff by implementing stormwater control measures. Future exposure to soil contamination, impact to groundwater and soil vapors will be mitigated/eliminated due to the removal of impacted soil from the Site.

Groundwater

To mitigate exposure risks during remediation and construction, the proper PPE will be employed and groundwater that is encountered during excavations will be dewatered and managed to minimize direct contact. The groundwater removed from the excavation will be treated and disposed of properly off-Site either in the Village of Port Chester sewer after treatment or shipped to an off-Site facility, effectively remediating contaminated groundwater and mitigating potential groundwater exposure pathways.

A private well survey was conducted for a 0.25-mile radius from the Site as part of the Qualitative Human Health Exposure Assessment and to evaluate the potential for exposure to contaminated

groundwater. A listing of properties within this area was generated and submitted to Suez Water Company for confirmation that water supply accounts for each of the properties exist. Suez Water Company stated that the list was very long and there were abandoned properties within this radius that do not have accounts with Suez. SESI performed a supplemental water well search using the NYSDEC Water Well Search Application for the Town of Rye in Westchester County, which includes the Village of Port Chester. Based on the search results, no water wells are present in the immediate vicinity of the Site. Additionally, pursuant to Chapter 873, Article VII of the Westchester County local ordinance law, the use of groundwater in Westchester County is prohibited. Therefore, the potential for exposure to impacted groundwater is further mitigated by the fact that groundwater in Port Chester, a village located in the Town of Rye, is not utilized for potable purposes.

It is also anticipated that once the Site is redeveloped, residual groundwater contamination, to the extent remaining, will naturally attenuate with time, reducing the risk of human heath exposure. Finally, further impacts to groundwater due to contact with soil contamination will be eliminated when the remediation is conducted, and the impacted soil is removed.

Soil Vapor and Indoor Air

As with soil and groundwater, potential exposure to soil vapor during construction will be minimized through the use of proper PPE and continuous air monitoring to ensure acceptable levels of airborne contaminants and dust. The planned soil excavation and building design is expected to address future exposure risk to soil vapor and indoor air into the on-Site building , because the foundation of this Site is in the groundwater table and there is an open-air garage level. A vapor barrier retarder membrane will be installed under the foundation and up the side walls of 20 mil thickness, which will be sealed at the seams (with at least a 12 inch overlap) and penetrations pursuant to DOH Guidance Document 4.2.2.b to prevent off-site soil vapor intrusion and inspection of the installation of the vapor barrier will be performed before the foundation is poured.

2.7.2 FISH AND WILDLIFE IMPACT ANALYSIS

The Fish and Wildlife Resources Impact Analysis Decision Key (NYSDEC, 2010; DER-10 Appendix 3C) was utilized to evaluate the Site for potential fish and wildlife impacts. The result of

the assessment determined that the Site does not contain any ecologically sensitive resources and hence the contaminated soils are not expected to have any impacts on any ecological resources. Therefore, a Fish and Wildlife Resources Impact Analysis is not needed. The completed Fish and Wildlife Resources Impact Analysis Decision Key is included with this report as **Appendix B**.

2.8 SIGNIFICANT THREAT

At the time of this report, the NYSDEC and NYSDOH have deemed the Site a significant threat to public health if left unremediated.

2.9 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.9.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

2.9.2 SOIL

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater contamination.

2.9.3 SOIL VAPOR

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.10 GREEN SUSTAINABLE REMEDIATION

During the course of the remedial action field activities, SESI will consider NYSDEC DER-31 "Green Remediation" implementation objectives. DER-31: Green Remediation provides the framework for DER's approach to remediating sites in the context of the larger environment, a concept known as "Green Remediation". Green Remediation (or greener cleanups) can be defined as "the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup actions." It is intended to be a holistic approach which improves the overall sustainability of remedial cleanups by promoting the use of more sustainable practices and technologies. Such practices and technologies are less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases (GHGs), to the atmosphere. The approach also recognizes the potential for positive economic and social benefits of site reuse and supports coordination of site reuse and remediation to affect the most beneficial and sustainable reuse of the site. Please note that final end use is dictated by local zoning codes. DEC's role is to ensure that the remedy is protective for the intended end use. Green Remediation concepts and techniques considered during the remedial activities will include:

- During construction activities and associated landscape alteration activities, green building strategies such as those outlined in the USGBC LEED should be considered;
- LEED includes guidelines and recommendations for new construction, and existing building operations and management that fall under six categories important for reducing the environmental impact of facilities of all types:
    - Sustainable sites
    - Water efficiency
    - Energy and atmosphere
    - Materials and resources
    - Indoor environmental quality
    - Innovation in operations

- As noted across the LEED categories, resources other than energy that can be conserved include water, raw materials for materials consumed, topsoil, paper for reports, and landfill space. Conserving one resource typically conserves other resources and has other sustainability benefits. For example, recycling construction and demolition debris or metal will reduce consumption of landfill space and may also save energy and reduce air emissions by reducing material transportation. Another example is the use of waste-to energy plants for waste disposal rather than landfills in states where these plants are currently operating. This also reduces the consumption of landfill space and results in energy production from waste processing. Other examples of resource conservation include treated water reinjection, the reuse of treated soil onsite, and the beneficial reuse of sediments.
- The use of “green” construction and project management products and materials such as ecofriendly concrete or the use of native plants for site restoration also advances the sustainability objectives of the project. It is important to understand that green remediation implies minimizing the entire footprint of the remediation project, which includes the environmental impacts of products and materials associated with the project. For example, eco-friendly concrete generally refers to concrete that is produced with a certain percentage of fly-ash (a waste product from the coal-firing process). This type of “green” concrete takes a problematic substance out of the waste stream and reduces the cumulative amount of energy associated with the production of concrete. The use of native plants for site restoration helps to conserve water and eliminate the need for potentially harmful fertilizers and pesticides.

Other approaches or considerations may be approved by NYSDEC on a case-by-case basis.

- Prohibiting idling vehicles and equipment, when possible, to reduce emission of CO2, N2O, CH4, and other greenhouse gases contributing to climate change;
- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term when choosing a site remedy;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;

- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development;
- Implementing the use of particulate detectors to monitor and minimize dust export of contaminants;
- Implementing the use of VOC detectors to monitor and minimize VOC exposures; and
- Coordinating sampling events to maximize on-site efforts while minimizing travel to/from the Site (economy of scale implementing multiple sampling events).

2.11 CLIMATE CHANGE VULNERABILITY ASSESSMENT

The Climate Change Vulnerability Assessment considers the Site remedies climate resiliency and considers the proposed remedy's vulnerability to climate change. The first step is to conduct a climate screening.

- Climate screening is a high-level desktop review of the site and potential changes in climate hazards. If the screening identifies potential exposure to climate hazards, a Climate Vulnerability Assessment (CVA) will need to be conducted. A CVA will identify adaptation measures to account for projected climate hazard exposures.
- For sites susceptible to climate change, require a Climate Adaptation Plan, which will incorporate findings and recommendations from the Climate Vulnerability Assessment.
- Consideration of the Site Elevation, Clim AID Region, Remedial Stage/site classification, Contamination, Proposed/Current Remedy, proximity to any sensitive receptors, whether the Site is in a disadvantaged community (DAC) or potential environmental justice area and remediation timeframe; and
- The relevance to the Site and the Remedy of Precipitation, Extreme Heat or Cold, Sea Level Rise, Flooding, Storm Surge, Wildfire, Drought, Storm Severity, Landslides and other hazards.

If potential impacts from climate hazards are identified, a climate vulnerability assessment must be conducted. This Climate Change Vulnerability Assessment should consider the reliability of

energy, potential for flooding/droughts, increased erosion potential, proximity to water bodies, and any other environmental factors subject to change. If already completed in a previous phase, the Climate Change Vulnerability Assessment should be updated as necessary throughout the environmental cleanup. Because the Site is not located within a designated floodplain, climate-related vulnerabilities are anticipated to be minimal.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the remedy is to achieve a cleanup that is the most protective of human health and the environment and that does not rely on ECs or ICs. This objective will most likely be accomplished by a Track 1 remedy eliminating the source material and achieving the USCOs at the depth of the excavation. If the groundwater or soil vapor requires monitoring or ECs in certain areas of the Site after issuance of the Certificate of Completion (COC), then the remedy would be a Track 2 to the extent that a Track 1 soil remedy has been achieved within five (5) years of issuance of the COC.

Track 1

A remedy pursuant to this track must achieve compliance with the USCOs set forth in 6 NYCRR Table 375-6.8(a).

In a Track 1 remedy, no institutional and engineering controls are allowed after the issuance of the COC. This alternative would involve the complete removal and/or remediation of the soil with exceedances of the USCOs, which were encountered during the RI to 15.0 ft-bgs across the Site. A feasible remedial technology that may be used to implement this alternative involves the excavation of the contaminated soil to 16.0 ft-bgs, which is the depth of contamination plus 1 foot, and transportation to an approved off-Site facility for disposal. Post-excavation samples will be collected at the target excavation depth. If the confirmation samples result in exceedances of USCOs, the excavation will continue in that location until USCOs are achieved or until bedrock is encountered, whichever is encountered first. Therefore, the planned excavation should be sufficiently deep to fulfill Track 1 remedy requirements for soils and will achieve the Track 2 remedy as a contingency in the event that additional excavation that may be required for a Track 1 remedy is not feasible.

Based on the results of the remedial investigation groundwater sampling events, petroleum VOCs, SVOCs, pesticides, metals and PFAS have been identified in groundwater above the AWQS. Groundwater will be sampled post soil removal. If the groundwater levels are below the AWQS or at levels that would not benefit from additional remediation or long-term monitoring

because asymptotic levels have been achieved, then the Site groundwater would achieve a Track 1.

Petroleum and chlorinated VOCs in soil vapor were detected during the RI. The proposed remedy includes the removal of all soil exceeding the USCOs which could be the source of VOCs in the soil vapor. Since the proposed building's foundation will be constructed in the water table and will include two (2) levels of unheated, aerated/ventilated parking garages, including the first floor garage and a basement garage beneath the footprint of the entire building, a soil vapor intrusion issue is not anticipated on-Site. A vapor barrier will be installed under the foundation and up the side walls to prevent off-site migration of any potential residual soil vapor contamination. Therefore, an inspection will be conducted to ensure the vapor barrier system is properly installed before the foundation is poured.

Track 2

Cleanups pursuant to this track may consider the intended future use in determining the appropriate cleanup levels for soil. This track requires the Volunteer implement a cleanup that achieves the Track 2 residential or restricted residential soil cleanup objectives (SCOs) from tables in 6 NYCRR 375-6.8(b), which is consistent with the intended Site use for the top 15 feet of soil (or bedrock if less than 15 feet). There are two applicable track 2 SCOs – Residential (RSCOs) and Restricted Residential (RRSCOs). The Site remediation pursuant to Track 2 Residential would involve excavation and disposal of the contaminated soils to meet one of these two (2) SCOs. Institutional and engineering controls that limit Site use and on-Site groundwater use can be used without regard to duration.

Given the depth to water and the planned excavation depth, dewatering will be required. Dewatering water will be treated, and discharge will be properly permitted. Following soil remediation, dissolved contamination in groundwater will be monitored via the RI monitoring well network. If the post-excavation monitoring of groundwater still results in PHCs that exceed the AWQS, then an oxygen release compound (ORC) will be introduced to the groundwater to enhance the natural attenuation of the petroleum VOC groundwater contamination. If groundwater contamination does not attain the AWQS or asymptotic levels before the issuance of the COC, then groundwater monitoring will continue under this Track 2 remedy. The groundwater levels are

expected to attain the AWQS or reach asymptotic levels by the time the COC is issued given the planned remediation or within five (5) years post COC. Institutional and engineering controls will be implemented to address contamination in groundwater until that time. A post-COC groundwater monitoring program will be detailed in a Site Management Plan (SMP).

Due to some petroleum soil vapor and an elevated exceedance of a chlorinated VOC (Methylene Chloride) in soil vapor, and the fact that building has an open air garage level and the foundation in the water table, the vapor barrier system design will be developed under the proposed foundation and up the side walls to prevent off-site migration of soil vapor and the design will be submitted for NYSDEC and NYSDOH approval. A soil vapor audit of the soil vapor barrier system will be completed once the system is installed before the foundation is poured. As noted above, the building will also have two (2) levels of unheated, aerated/ventilated garages (first floor garage and a basement garage beneath the footprint of the entire building) that will serve to eliminate the potential for soil vapor intrusion into the future building.

Track 4

A Track 4 remedy for restricted residential use does not need to meet specific soil cleanup objectives but requires source removal and typically a Site-wide cover system where, as here, there is Site-wide surficial contamination.

Short- and long-term institutional and engineering controls can achieve protection of public health and the environment. In the event a remedy under Track 4 were to be implemented for this Site, it must provide a cover system over exposed remaining soil contamination. Soil that is not otherwise covered by structures such as buildings, sidewalks or pavement must be covered with two (2) feet of soil that complies with the RSCOs or RRSCOs.

Long-term monitoring of groundwater will continue under a Track 4 residential remedy. An SSDS will likely be required to serve as an active EC and will operate pursuant to the Site Management Plan to mitigate any vapor intrusion risk resulting from the VOC.

A Track 4 remedy would also include an SMP to ensure that any institutional and engineering controls are maintained, and that and future material removed from the site (post remedial action)

is managed properly. The SMP would include periodic (annual) monitoring and reporting of the cover system to ensure continued protection of the human health and the environment.

No Action Alternative

The no action alternative would leave existing sources of contamination in soil and groundwater and soil vapor. The no action alternative is thus unacceptable and has not been compared to the factors below.

Protection of human health and the environment:

Although all tracks will provide adequate protection of human health and the environment, the Track 1 remedy would be more protective than the other cleanup tracks because it would remove all soil contamination to achieve the State's most stringent SCOs and treat the remaining groundwater and soil vapor is the most rapid timeframe post-COC. This Track 2 remedy may require short-term ongoing temporary institutional and engineering controls to manage any remaining vapor contamination to effectively protect human health and the environment and monitor the degradation of the remediated groundwater. A Track 1 remedy also initially costs more and is less implementable than the Track 2 and 4 remedies. However, a Track 1 remedy can be implemented through the complete removal of all the contaminated soil, and implementation of an in-situ groundwater treatment remedy, which should facilitate the natural attenuation of the remaining groundwater contamination more rapidly than from the other remedies. Moreover, because a Track 1 remedy requires no long-term institutional or engineering controls, it is potentially less costly and more implementable in the long term than the Track 2 and 4 remedies, which rely on such controls for long-term effectiveness. A Track 2 remedy would also be protective of human health and the environment if the proper long-term engineering and institutional controls are put in place and managed in an SMP. A Track 4 remedy would also be protective of human health and the environment if the proper long-term engineering and institutional controls are put in place and managed in an SMP. However, groundwater and soil vapor would remain contaminated for a longer period of time.

Compliance with standards, criteria, and guidelines (SCGs):

All cleanup tracks will achieve applicable cleanup standards. A Track 1 remedy achieves a more stringent set of standards than a Track 2 remedy. A Track 4 remedy is not driven by standards

but rather by source removal and SMP ECs and ICs to manage the remaining contamination in place to enable the safe reuse of the site for restricted residential purposes.

Short-term effectiveness and impacts:

Generally, a Track 1 remedy provides the best short-term effectiveness because it promptly removes the most contaminant mass from the Site. A Track 2 remedy also accomplishes this, but to a lesser extent. A Track 4 remedy is less effective in this regard but has the immediate shortest impacts. Track 1 and 2 remedies are somewhat less favorable in terms of short-term impacts primarily because mass removal of the contaminated soils generates more truck trips than a Track 4 limited removal remedy. A Track 4 remedy also reduces the risk of construction worker exposure by reducing the volume of contaminated soil being managed and has less potential to cause dust and traffic issues. Excavation may result in a greater potential for migration of impacts from the open excavation (e.g. wind erosion, stormwater intrusion, etc.); however, implementation of the HASP, CAMP monitoring, and dust, odor, erosion and sediment controls will be implemented to minimize and control any migration. Thus, the preferrable long-term impacts from implementation of a Track 1 or 2 remedy outweigh the favorable short-term impacts of a Track 4 remedy.

Long-term Effectiveness and Performance:

Because the Track 1 and 2 remedies would involve removal of the greatest amount of contaminated soil, they will provide the most long-term effectiveness but greater short-term impacts which can be managed via the HASP, CAMP monitoring, and dust, odor, erosion and sediment controls measures. As already discussed above, a Track 1 remedy will allow the Site to be used for any purpose without restriction and without reliance on the long-term employment ICs or ECs (which can fail and require ongoing monitoring and maintenance to remain effective over the long-term). A restricted residential Track 2 remedy allows the Site to be used for almost all possible uses in an urban setting but requires ECs and ICs to ensure there is no exposure to residual contamination.

The long-term effectiveness of the Track 4 remedy will be ensured with adherence to the SMP and recording of an EE. Although contaminants are left on Site, a properly maintained cover

system is effective at eliminating the risk of dermal exposure and the planned soil vapor mitigation measures will also help to ensure lack of exposure to any remaining on-Site vapors.

Reduction of toxicity, mobility, or volume of contaminated material:

Track 1, 2 or 4 remedies will reduce toxicity and mobility. A Track 1 or 2 remedy would result in a greater reduction in the volume of contaminated soil than a Track 4 remedy. While a Track 4 remedy provides a relatively smaller reduction in volume than the other tracks, it relies primarily on the decrease of contaminant mobility.

Constructability:

Track 1, 2 and 4 remedies are implementable given the location and the planned use for the Site. While there are short-term potential impacts from each potential remedy, the Site is located in the middle of an urban area, and therefore disposal of the contaminated soil and truck access will not be a problem. Moreover, these short-term impacts will be avoided through implementation of the CAMP and HASP, which will employ truck washing and odor and dust control measures. Therefore, Track 1, 2 or 4 remedies are implementable for this Site.

Cost Effectiveness:

The preferred alternative should provide optimal suitability for the eight (8) accompanying evaluation factors with minimal remedial cost. The contaminated soil extends from the surface to a depth of 15 ft-bgs. Removal of all soils containing VOCs, SVOC, pesticide, and metals, to remove the exceedances of the UUSCOs to achieve Track 1 or removal of exceedances of the RSCOs or RRSCOs to achieve Track 2 Site wide will be more costly than a Track 4 remedy. However, this mass removal results in long-term savings by eliminating (or, in Track 2, significantly reducing) the need for long term ICs/ECs, and the associated ongoing monitoring and maintenance. In addition, a Track 1 or 2 remedy should eliminate any on-Site soil source that may be contributing to soil vapor issues at the Site. Therefore, a Track 1 or 2 remedy for the Site is cost effective. A Track 4 remedy is more cost effective but would leave a lot of contaminant mass in place.

Dewatering and then the implementation of an in-situ treatment remedy for groundwater will enhance the removal of dissolved CVOCs on the Site. Some cost savings may be derived if the duration of groundwater monitoring is reduced.

Community Acceptance:

A community outreach program has been and will continue to be incorporated into all remedial alternatives, per NYSDEC Brownfield Program law and regulations and through the continued implementation of the Citizen Participation Plan (CPP). The community should accept any of the remedies; however, the Track 1 or 2 remedy would likely be preferable to the community since each of these remedies would remove the most soil contamination.

Land use:

Track 1 or 2 remedies would allow for the planned residential use of the Site, which is consistent with land uses in the area.

Zoning: All of the proposed remedies under each track will facilitate the Site to be utilized for a proposed mixed-use residential development, which is consistent with applicable zoning laws and anticipated future use of the site.

Applicable comprehensive community master plans or land use plans: Implementation of all tracks (with institutional controls) cleanup will facilitate the proposed mixed-use residential development, which is consistent with the current local land use plan, which is encouraging transit-oriented development near the Port Chester Metro North train station.

Surrounding property uses: Any cleanup approach is not expected to significantly impact land use of the surrounding properties as the truck traffic and access will be on public roads.

Citizen Participation: Citizen Participation during implementation of a remedial program will proceed in accordance with the CPP included as **Appendix C** and as noted above will have minimal community impact. Any short-term impacts will be addressed by the CAMP and the HASP.

Environmental justice concerns: There are no known environmental justice concerns associated with this project.

Land use designations: A Track 1 remedy will not restrict any current or future land use designations. A restricted residential Track 2 remedy will have very minimal restrictions on the future land use of the property. A Track 4 remedy will have restrictions that will need to be managed in the SMP and EE in perpetuity.

Population growth patterns: Any of the proposed remedies will not impact reasonably anticipated population growth patterns in the area other than to better accommodate growth by providing for additional housing.

Accessibility to existing infrastructure: Some on-Site old utility infrastructure will likely have to be demolished and removed as part of the remediation. However, new infrastructure will be installed subsequent to the remediation as part of the redevelopment.

Proximity to natural resources: There are no surface water bodies or streams on or directly adjacent to the Site. SESI did not observe any areas suspected to be wetlands on the Site. Stormwater drainage patterns are generally consistent with the surrounding topography and primarily flow to the east/northeast, toward the Byram River located approximately 1,500 feet east.

Geography and geology of the Site: See Section 2.4 above.

Current Institutional Controls: There are no current institutional controls associated with the Site.

3.2 SELECTION OF THE PREFERRED METHOD

The remedial alternatives analysis determined that a Track 1 (if achievable) remedy will be the goal for the Site. If Track 1 cannot be achieved due to remaining groundwater or soil vapor contamination conditions, a Track 2 remedy will be achieved.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

A summary of the selected Track 1 or 2 remedial actions to address the impacts identified are discussed below:

1. Removal of concrete slab remnants and asphalt pavement as required and any remaining subsurface infrastructure that may be encountered.
2. Installation of a SOE system around the entire site will be installed to facilitate the removal of impacted soils to a maximum depth of 17.0 ft-bgs to support the planned excavation ranging from 6.0 to 17.0 ft-bgs (**Figure 2.2**). The SOE will extend to varying depths based on the requirements to excavate for remediation and construction. All required permits will be obtained prior to the start of work.
3. Excavation of all Site soils to achieve an UUSCO by removing the complete extents of contaminated fill/ soil.

4. Documentation of all appropriate off-site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
5. Collection of end point /documentation samples to demonstrate the UUSCOs were achieved at a rate of one sample per 900 square feet of excavation base and one sample per 30 linear feet of excavation sidewall (where feasible given presence of SOE).
6. Dewatering and property off-site disposal of contaminated groundwater.
7. Upon acceptance of documentation samples, the excavation will be backfilled to specified redevelopment construction design grades.
8. Import of backfill materials during redevelopment construction activities, to be used for backfilling and soil cover, if necessary, must be sampled in accordance with Section 5.4(e) of the DER-10 and be approved by the NYSDEC Project Manager.
9. Prior to construction of the building slab, install a sub-slab vapor barrier to mitigate against the potential for soil vapor intrusion into the future Site buildings.
10. Repair and replacement as needed of monitoring wells for future groundwater monitoring (the current monitoring well network is shown on **Figure 2.1**). The monitoring well network will be considered an engineering control as long as it is required to monitor the groundwater conditions.
11. To the extent the AWQS or asymptotic levels are not achieved before the COC is issued, recording of an Environmental Easement (EE) for the entire Site for groundwater monitoring. The EE will remain effective until any required ECs and Institutional Controls (ICs) are removed if an unconditional Track 1 remedy is accomplished within five (5) years. If the unconditional Track 1 remedy is not achieved in this timeframe as a result of any remaining on-Site conditions that do not meet the BCP Track 1 requirements, the EE will continue under a Track 2 remedy for any residual groundwater and soil vapor contamination provided the vapor on Site is not emanating from an off-site source.
12. Preparation of an SMP, for the Track 2 alternative remedy, for short-term management of residual contamination as required by the Environmental Easement, particularly as they pertain to future phases of construction, including plans for: (1) Institutional and Engineering Controls, (2) groundwater and soil vapor monitoring, and

(3) reporting. Additional groundwater treatment, such as injections, if needed, will be conducted under the SMP if groundwater levels did not achieve the AWQS or asymptotic levels that are accepted by the NYSDEC and NYSDOH.

13. Import of backfill materials, if needed, during redevelopment construction activities, to be used for backfilling and soil cover, if necessary, must be in compliance with: (1) chemical limits and other specifications included in NYCRR Sections 375-6.7(d) and 375-6.8 (b) and DER-10 (2) all Federal, State, local rules and regulations and site-specific approvals for handling/reuse and transport of material.
14. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations and overseen and certified by the SESI Remedial Engineer of Record described below.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP. All deviations from the RAWP will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER).

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

4.1.1 SITE-SPECIFIC HEALTH AND SAFETY PLAN

A copy of the SESI HASP is included as **Appendix D**. All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

4.1.2 QUALITY ASSURANCE PROJECT PLAN (QAPP)

A copy of SESI QAPP is included as **Appendix E**. All field sampling procedures and analytical methods will be implemented in accordance with this QAPP.

4.1.3 SOIL/MATERIALS MANAGEMENT PLAN (SoMP)

The SoMP is included in Section 5.12 and includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes all of the controls that will be applied to these efforts to ensure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

4.1.4 SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN

The Soil Erosion and Sediment Control Plan (SESC) addresses requirements of the New York State Stormwater Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soil, via wind or water. The SESC is provided as **Appendix F**.

4.1.5 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan for the RAWP at the Site will be implemented in accordance with the requirements of DER-10 Appendix 1A. The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone. Special CAMP requirements may apply due to the proximity of the Site to adjacent properties within 20 feet of potentially exposed individual structures as specified in the CAMP.

The CAMP stations will be active and monitored during all ground intrusive activities and soil handling activities at the Site. The CAMP data will be submitted to NYSDEC and NYSDOH on a weekly basis, at a minimum, while ground intrusive and soil handling are taking place. In addition, the NYSDEC and NYSDOH will be notified as soon as possible and within one (1) business day of monitoring results which exceed the action levels, including the duration and actions taken in response to exceedances. A copy of the CAMP for the Site is included as **Appendix G**.

4.1.6 CITIZEN PARTICPATION PLAN

A certification of mailing will be sent by the Volunteer to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing. The CPP is included as **Appendix C**.

Document repositories have been established at the following locations and contain all applicable project documents:

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Port Chester-Rye Brook Public Library
Robin Lettieri, Director
1 Hasco Avenue
Port Chester, 10573
Hours:
Mon 9a-9p
Tues-Fri 9a-5p
Saturday 9a-12p
Sunday Closed

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: Index of /data/DecDocs/C360214

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 PROJECT ORGANIZATION

28 Pearl Street Development LLC is the BCP Volunteer and developer of the Site. SESI is the environmental consultant for the Volunteer. A table summarizing the various personnel associated with the project is included as **Table 4.1** below.

Table 4.1 – Project Personnel

Name	Company	Project Position	Address	Phone Number
Jake Borden	28 Pearl Street Development LLC	Volunteer Contacts	181 Westchester Avenue, Suite 301A Port Chester, NY 10573	(617) 378-1862
Sean Mullin	SESI Consulting Engineers, P.C.	Environmental Consultant's Project Manager	959 Rt 46 East, Parsippany, NJ 07054	(973) 808-9050
Fuad Dahan, PE	SESI Consulting Engineers, P.C.	Remedial Engineer	959 Rt 46 East, Parsippany, NJ 07054	(973) 808-9050
Michael Squire	NYSDEC	Project Manager	625 Broadway, Albany, NY 12233	(518) 402-9546

4.2.2 REMEDIAL ENGINEER

The Remedial Engineer for this project will be Fuad Dahan, PE. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the 28-34 Pearl Street Site (BCP No. C360214). The Remedial Engineer will certify the FER that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization,

removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER.

The Remedial Engineer will provide the certifications listed in the FER.

4.2.3 REMEDIAL ACTION SCHEDULE

A remedial action schedule is included as **Table 4.2** below. The schedule includes estimates of time required to complete the activities associated with the remedial action. It is based on elapsed time from receipt of NYSDEC approval. Once NYSDEC approves this RAWP, an updated schedule showing actual dates will be provided to the NYSDEC as an addendum to this plan.

Table 4.2 – Remedial Action Schedule

Activity	Date
RIR submission	February 2026
RAWP submission	February 2026
Start of RAWP Public Comment period	March 2026
NYSDEC approves RAWP and issues decision document	April 2026
Site Prep and Remediation	June 2026 – October 2026
Submission of Environmental Easement	July 2026
Submission of SMP	August 2026
Submission of FER	October 2026
Certificate of Completion	December 2026

4.2.4 WORK HOURS

The hours for operation of remedial construction will conform to the City of Port Chester construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Applicant of any variances issued by the Department of Buildings.

4.2.5 SITE SECURITY

The Site will be secured with fences and locked gates.

4.2.6 AGENCY APPROVALS

The Volunteer has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by Port Chester Planning Department. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.7 PRE-CONSTRUCTION MEETING WITH NYSDEC

A pre-construction meeting will be held with NYSDEC prior to the start of major remedial construction activities.

4.2.8 EMERGENCY CONTACT INFORMATION

An emergency contact sheet with names and phone numbers is included in **Table 4.3** below. That document will define the specific project contacts for use by NYSDEC and NYSDOH in case of a day or night emergency.

Table 4.3 - Emergency and Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3-day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
Fuad Dahan – Remedial Engineer (SESI Consulting Engineers)	(973) 808-9050
Director of Construction	TBD

* Note: Contact numbers subject to change and will be updated as necessary

4.3 SITE PREPARATION

4.3.1 MOBILIZATION

Mobilization tasks will include:

- Demolition of remaining structures, including remaining concrete foundation slabs and asphalt pavement;
- Construction of temporary facilities and utilities;
- Set-up of construction equipment and facilities;
- Construction of fencing and barriers;
- Construction of erosion control measures; and
- Construction of decontamination and materials staging areas.

4.3.2 WORKER TRAINING AND MONITORING

All on-Site project personnel who work in areas where they may be exposed to Site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in the HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the Site.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating Site

activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the Site. Additionally, on-Site subcontractor personnel must conduct daily Site safety meetings.

4.3.3 TRAFFIC CONTROL

Traffic control shall be the responsibility of the Volunteer its contractors. Traffic control must comply with all local, state, and federal regulations including but not limited to the Village of Port Chester Traffic Commission and the Manual on Uniform Traffic Control Devices.

4.3.4 UTILITY MARKER AND EASEMENTS LAYOUT

The Volunteer and its contractors will be solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors will obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

4.3.5 SUPPORT OF EXCAVATION

Installation of an SOE system to a maximum depth of 17.0 ft-bgs will be required to provide structural stability of the 17 ft-bgs remedial soil excavation and to protect surrounding buildings, sidewalks and roadways. The SOE will act as a support for the excavation during the remediation of contaminated soil on Site and will be designed to prevent off-Site migration by installing a vapor barrier up the side walls of the SOE. Contaminated soil will be disturbed during the installation of the SOE measures. Based on the observed depth to bedrock across the Site, limited rock removal may be required to support attainment of Track 1 standards. The depth to bedrock has been observed to be approximately 8 to 20 feet below the ground surface, based on geotechnical investigations. The SOE design is expected to include soldier piles and lagging along the street frontage, as well as a secant pile or tangent pile wall along the adjacent properties, with depths varying depending on location and adjacent building load. The SOE will be equipped with an impermeable membrane to prevent off-site migration of soil vapor.

The impermeable membrane is anticipated to consist of a continuous, chemically resistant vapor barrier system installed along the interior face of the SOE. The membrane will be selected based on its low permeability to VOCs and durability under anticipated site conditions, including exposure to moisture, soil pressure, and potential construction impacts. Seams between membrane sections will be sealed using heat welding or compatible adhesive systems to maintain continuity and prevent vapor intrusion pathways. Installation will follow manufacturer specifications and applicable industry standards.

4.3.6 SITE PREPARATION DEMOLITION

Site preparation, including demolition of remaining on-Site foundation structures and pavement removal, will take place prior to the start of the soil excavation. Demolition of the concrete foundation slabs and asphalt pavement is required to obtain access to the surface and subsurface sufficient to remediate the Site.

Continuous air monitoring was conducted for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures, and as a best practice during any demolition. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells proposed.

The Final Engineering Report (FER) will include a section to document that building demolition was completed in accordance with all applicable regulations. It will include documentation of asbestos/lead surveys, asbestos and/or lead based paint abatement (as applicable), local demolition permitting, and proper off-site disposal of all materials.

4.3.7 DEWATERING

Dewatering will be required as part of this remedy because groundwater was identified at depths of approximately 7 to 11 ft-bgs. During the Site remediation, dewatering will be implemented during the excavation work where groundwater is encountered in order to prevent direct contact with the groundwater. The water will be properly contained, treated and disposed off-Site either in the public owned treatment works sewer or shipped to an approved off-Site treatment facility depending on contamination levels and permit requirements. Further groundwater remediation

will aim to mitigate potential groundwater and vapor concerns and try to reduce contamination to levels below the AWQSs or to asymptotic levels through implementation of dewatering and the in-situ treatment remedy. Groundwater will likely be discharged after treatment to the Village of Port Chester sewer system in accordance with the Approval to Temporarily Discharge Groundwater into Sewers Dewatering Permit Guidelines.

4.3.8 EQUIPMENT AND MATERIAL STAGING

Equipment and material staging areas are expected to be relocated throughout the Site during remedial construction.

4.3.9 DECONTAMINATION AREA

A tracking pad will be required for any vehicles going off-site that have come in contact with on-Site soil. The decontamination area construction and operational requirements are provided in the HASP. All vehicle tires must be washed before exiting the Site.

4.3.10 SITE FENCING

A construction safety fence will be installed around the entire perimeter of the Site. Access through gates will be provided at various points as required by the Volunteer and its contractors. These gates will be locked during non-construction hours.

4.3.11 DEMOBILIZATION

Demobilization will include the following:

- Restoration of areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management area[s], and access area);
- Removal of temporary access areas (whether on-Site or off-Site) and restoration of disturbed access areas to pre-remediation conditions;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination; and
- General refuse disposal.

4.4 REPORTING

4.4.1 DAILY REPORTS

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers within two (2) business days of the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions;
- Photographs of site activities;
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of CAMP results, odor and dust excursions and corrective actions, and all complaints received from the public. The NYSDEC assigned project number will appear in all reports.

4.4.2 MONTHLY REPORTS

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of each month following the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons/cubic yards of material exported and imported, etc.);

- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.
- Tracking of Green Sustainable Remediation (GSR) metrics determined during the design process should be included in monthly reports.

4.4.3 OTHER REPORTING

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

Any exceedance of the CAMP levels will be reported to the NYSDEC and NYSDOH within 24 hours of its occurrence.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (SEFA, SiteWise™ or otherwise approved method) should be included.

The Climate Screening process and results will be documented in the form of a completed checklist and brief letter report. If the Climate Screening results indicate that a Climate Vulnerability Assessment (CVA) is necessary, a complete CVA Report will be developed. The CVA Report will be included as an Appendix or Attachment in relevant documents and/or submitted as a standalone report.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on-Site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 COMPLAINT MANAGEMENT PLAN

A public information board will be constructed at the perimeter of the Site. This information board will contain the phone number of the Volunteer where complaints may be directed. General information notices to the public will also be posted on this board for their benefit.

4.4.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

If there are any deviations from the RAWP, the following steps will be taken:

- Reasons for deviating from the approved RAWP will be identified and communicated directly to the NYSDEC Project Manager;
- All deviations will be communicated verbally and in writing (by letter or email) to the NYSDEC Project Manager;
- The deviations will be implemented based on verbal or written approval of the NYSDEC Project Manager. All verbal approvals will be followed up in writing.
- The effect of the deviations on the overall remedy will be described/addressed in the FER.

4.5 AGENCY APPROVALS

The Volunteer has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction. The planned end use for the Site is in conformance with the current zoning for the property as determined by the Village of Port Chester Department of Planning and Economic Development. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

A complete list of all federal, state and local governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached will be obtained and provided in the Final Engineering Report. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone

number in that agency. This list will be updated in the Final Engineering Report.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

5.0 REMEDIAL ACTION

5.1 CLEANUP OBJECTIVES

The SCOs for this Site are the Track 1 UUSCOs.

- The groundwater cleanup objectives will be the NYSDEC TOGS AWQS.
- The soil vapor objectives will be the most recent NYSDOH Guideline Values and Decision Matrices for the specific contaminants of concern including in the matrices therein.

5.2 SOIL REMEDIAL ACTION

Removal of all contaminated soil under the Remedial Action for the Site will be implemented in accordance with the Site-specific QAPP (**Appendix E**). Soil exceeding the UUSCOs extends to a depth of 15.0 ft-bgs based on the RI and prior investigation performed. A plan depicting the locations where the remedial excavation activities will be carried out to planned depths ranging from 6.0 to 15.0 ft-bgs is included as **Figure 2.2**. The depth was determined based on the deepest exceedance of the UUSCOs documented during prior investigations and remedial investigations, plus a foot of additional depth. The estimated excavation volume for is approximately 8,500 cubic yards (CY) of remedial excavation. This estimate includes the use of 2:1 benching in shallow excavations located adjacent to deeper excavations and is designed to ensure full compliance with applicable OSHA safety standards. If the excavation of soils exceeding UUSCOs cannot be accomplished due to Site restrictions, the remaining soils will be compared to RSCOs and RRSCOs for a Track 2 contingency remedy.

5.3 GROUNDWATER REMEDIAL ACTION

Soil will be remediated to remove the source of groundwater contamination. Given the depth to water and the planned excavation depth, dewatering will be required. The extracted water will be stored for off-site treatment or will be treated on-site for disposal in the City sewage under a discharge permit. The discharged water will be sampled per the permit requirements and will be discharged only if it meets the permit concentration levels. Post-excavation groundwater sampling of VOCs, SVOCs, metals and PFAS will be collected. Based on the groundwater sample results, treatment may be implemented if required. However, it is expected that the analytical results will meet the AWQS or reach asymptotic levels by the time the COC is issued or if not, within five (5) years post-COC.

5.4 SOIL VAPOR REMEDIAL ACTION

Although it is expected that the removal of impacted soils and remediation of elevated groundwater concentrations will significantly reduce the potential for vapor intrusion in the future redevelopment of the property, the vapor intrusion risk on this Site cannot occur based on the building design which will include two (2) levels of unheated, aerated/ventilated garages(first floor garage and a basement garage beneath the footprint of the entire building) and the foundation of the sub-slab of the proposed building is under the water table. In addition, the foundation will include a soil vapor barrier to prevent soil vapor intrusion from leaving the Site. A 20-MIL sealing vapor barrier will be installed beneath the basement slab of the proposed building and up the side walls.

5.5 REMEDIAL PERFORMANCE EVALUATION

5.5.1 END-POINT SAMPLING FREQUENCY

For all excavations, post-excavation soil samples will be collected in accordance with Section 5.4 of DER-10 for analysis of TCL+30/TAL, PFAS, and 1,4-dioxane. All impacted Site soils will be removed down to depths up to 17.0 ft-bgs within the final SOE boundary as required to achieve the Track 1 remediation. Endpoint verification sampling will be implemented on an approximately 30 x 30-foot grid, or every 900 square feet (SF) at the base of the excavation and documented by field personnel. Proposed end point sampling locations are presented as **Figure 5.1**.

End-point samples will be collected manually from the top six (6) inches of soil from the bottom of the excavation. In addition to each end-point sample, two additional samples will be collected from 1.0-1.5 and 2.0-2.5 feet below the initial sample and will be placed on hold. If the initial end-point sample exceeds the UUSCOs, the contingent samples will be analyzed to achieve compliance. The soil will then be excavated to the required depth determined by the contingency samples. If the results of the contingent samples exceed the UUSCO standards, the process will continue until the analytical results are compliant or bedrock is encountered, whichever occurs first or a decision will be made to revert to a Track 2 remedy. Regardless of the depth of the over excavation, confirmation samples will be collected for every one foot of additional excavation depth. These samples will be held and run as needed to ensure that an accurate account of the volume of excavated impacted soils can be derived. Confirmatory sampling locations will be

surveyed, and the location and elevation will also be recorded and presented on the final soil removal maps. Documentation will be presented in the FER.

5.5.2 GROUNDWATER SAMPLING

The remedy will include mass source removal during the remedial excavation and dewatering to remove some contaminated groundwater. One round of groundwater sampling will be conducted in order to verify if the remedy is effective in treating groundwater or if further treatment is required. The goal of the groundwater remedy is to achieve the TOGS AWQS standards or to reach asymptotic levels. Residual groundwater contamination will be monitored following remediation from the well locations of the RIR. If the wells are destroyed or decommissioned during soil excavation, the wells will be installed in the same RIR locations to the extent possible. The current well locations are depicted on **Figure 2.1**. A typical well construction diagram is provided in **Appendix H**.

5.5.3 VI MITIGATION

Since the building foundation is under the water table and there will be an open-air garage under the residential levels of the building, there is no potential for soil vapor intrusion into the proposed building. A vapor barrier comprised of 20-mil thickness of high or low-density polyethylene (H or LDPE) or an approved equal will be installed under the slab and up the side wall to prevent any potential for residual off-site soil vapor migration. All the utility penetrations into the slab will also be sealed. An inspection of the soil vapor barrier installation will be performed before the slab is poured.

5.6 METHODOLOGY

Soil samples will be collected in accordance with the QAPP using disposable gloves/trowels or dedicated, decontaminated stainless-steel spoons. Groundwater samples will be collected in accordance with the QAPP using the low-flow purging and sampling method and associated decontamination and quality control procedures.

5.7 REPORTING OF RESULTS

The samples will be submitted to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory. The results will be reported in accordance with NYSDEC

requirements for Category B data deliverables (as outlined in DER-10). In addition, all data collected during the remedial action will be submitted in the NYSDEC approved Electronic Data Deliverable format using the NYSDEC's Environmental Information Management System database software application EQuIS™.

5.8 QA/QC

Collection of quality assurance/quality control (QA/QC) samples to evaluate potential cross-contamination from sampling equipment and during shipment of samples and repeatability of laboratory analytical practices will be in accordance with the QAPP included as **Appendix E**. Field blanks, trip blanks and duplicate samples associated with daily sampling activities will be collected as a part of the QA/QC practices.

5.9 DATA USABILITY SUMMARY REPORT (DUSR)

To ensure that the field sampling and laboratory analytical practices are acceptable, the data associated with all the samples will be validated by a third party (in accordance with requirements of DER-10). The validation approach and results will be presented in a DUSR to be included in the FER.

5.10 REPORTING OF END-POINT DATA IN FER

The FER will include a table of final soil and groundwater sample data with highlights or a summary of exceedances of the Track 1 UUSCOs and AWQS.

The FER will include a table of end point data with highlights or a summary of exceedances of SCOs. A spider map showing all SCO exceedances will also be presented in the FER.

Analytical laboratories used for all end-point sample analysis and contingency sample analysis will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling where needed, will be performed in accordance with DER-10 sample frequency requirements at a rate of one for every 900 square feet. A post-excavation sampling plan is shown in **Figure 5.1** where the grids are 30 by 30 feet. Post excavation samples will be collected from center of each grid as the excavation proceeds.

In addition, although not depicted on the plan, sidewall samples will be collected within the Site in accordance with DER-10 where adjacent grids are excavated to different depths (greater than 2-foot variance). The results will be shared with the NYSDEC in the weekly report. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.11 ESTIMATED MATERIAL REMOVAL QUANTITIES

Source removal excavation activities will be implemented during the course of the remediation activities throughout the footprint of the Site. Based on the RI, the depth of contaminated fill/ soil ranges from 0.5 to 17.0 ft-bgs. The entire Site within the SOE will be excavated to remove all soil exceedances in order to achieve a Track 1 remedy.

The estimated quantity of soil/fill to be removed from the Site is approximately 8,500 CY. Required excavation depths are varied based upon contaminant depths determined during the Prior Investigations and remedial investigation work. A plan depicting the proposed excavation depths is included as **Figure 2.2**. The depth was determined based on the vertical delineations determined during the RI. The actual excavated volume will be reported in the FER as a tally of the manifests and tickets of the soils disposed of off-site.

5.12 SOIL/MATERIALS MANAGEMENT PLAN

Material will be required to be excavated during remediation activities. Any required fill will consist of imported clean fill that meets the requirements per 6 NYCRR Part 375-6.8(d) and the requirements for emerging contaminants sampling per the October 2020 NYSDEC Guidance Document.

5.12.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (Residual Contamination Zone). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundation and utility work, prior to issuance of the Certificate of Completion.

All primary contaminant sources identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the FER.
Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (i.e. those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.12.2 STOCKPILE METHODS FOR CONTAMINATED SOILS

Stockpiles of contaminated materials, if needed, will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. Soil stockpiles will be encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

5.12.3 MATERIALS EXCAVATION AND LOAD-OUT

The Remediation Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.
The presence of utilities and easements on the Site has been investigated during the remedial investigation work. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation requirements (and all other applicable transportation requirements).

A truck wash associated with construction activities will be operational during construction. A truck wash is always required for large soil excavation projects such as this. The Remediation Engineer will be responsible for ensuring that all outbound trucks are not causing any off-site tracking of the contaminated soil.

Locations where vehicles enter or exit the Site will be inspected daily for evidence of off-Site sediment tracking.

The Remediation Engineer will ensure that all egress points for truck and equipment transported from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

The Volunteer and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

5.12.4 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Truck transport routes will be included in the SOP. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed inbound and outbound truck routes to the Site will take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major

highways; (e) promoting safety in access to highways; (f) overall safety in transport; and (g) community input, which was sought and obtained during the local land use approval process. Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-Site in order to minimize off-Site disturbance. Off-Site queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

A tracking pad will be installed at the Site egress to ensure clean-up of the soils from the truck tires. If needed, truck tires will be washed. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

5.12.5 MATERIALS DISPOSAL OFF-SITE

Approval from appropriate disposal facilities will be received prior to start of work. The total quantity of material expected to be disposed of off-Site is approximately 10,500 CY.
All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed of in accordance with all local State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site will not be undertaken without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of

material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soil taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2.

Historical fill and contaminated soils from the Site are prohibited from being disposed of at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

The FER will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes, if any, derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling

frequency, analytical results and QA/QC will be reported in the FER. All data available for soil/material to be disposed of at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.12.6 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. If any liquids need to be discharged into the sewer system, then approval by local utility authority and NYSDEC will be sought prior to the discharge. Dewatered fluids will not be recharged back to the land surface or subsurface of the Site without NYSDEC approval.

Water generated during remedial construction will not be discharged to surface waters (i.e. a local pond, stream or river) without a state pollutant discharge elimination system permit.

5.12.7 BACKFILL FROM OFF-SITE SOURCES

Backfilling is expected to be needed in certain of areas on the Site. The imported material, if needed, will be sampled in accordance with DER-10 Section 5.4 (e) Table 5.4 (e)10 and paragraph 10. The samples will be analyzed for TCL VOCs, TCL SVOCs, pesticides, PCBs, and TAL metals, including cyanide. The soil may be used as cover material provided that all parameters meet the UUSCOs, per the NYSDEC regulatory requirements. In addition, composite samples will be collected for emerging contaminants in accordance with the NYSDEC Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances (April 2023).

All materials proposed for import onto the Site will meet the UUSCOs, will be approved by the Remedial Engineer, and will be in compliance with provisions in this RAWP prior to receiving receipt at the Site. A “Soil Reuse/Import” form will be submitted to the NYSDEC for pre-approval prior to importing any soils on -Site. Bills of Lading or equivalent documentation will be obtained to track the amount of soil arriving onto the Site and verify the source of soil being imported.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The Final Engineering Report will include the following certification by the Remedial Engineer: "I certify that all import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan".

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC will be construed as an approval for this purpose.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this Remedial Action Work Plan will be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soil will be securely covered with tight fitting covers.

5.12.8 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides, PCBs and PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

5.12.8.1 EXTREME STORM PREPAREDNESS AND RESPONSE CONTINGENCY PLAN

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the Volunteer will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from excavated areas, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.
Dewatering is anticipated to be required for this Site. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained as necessary.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of NYSDEC.

If on-Site petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's spill hotline at (800) 457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume

of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions.

This report should be completed and submitted to NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.12.9 COMMUNITY AIR MONITORING PLAN

A CAMP will be implemented during RAWP remedial actions in the field at the Site in accordance with the requirements of DER-10 Appendix 1A. The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone. Details of the air monitoring program including perimeter air monitoring objectives, methods, and actions levels are detailed in the CAMP provided in **Appendix G**.

5.12.10 ODOR, DUST, AND NUISANCE CONTROL PLAN

Odor, dust, and nuisance control will be in accordance with the site-specific Health and Safety Plan and the CAMP as specified in Section 5.12.9 of this RAWP. The FER will include the following certification by the Remedial Engineer: “I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan.”

Odor Control Plan

This odor control plan is designed to control emissions of nuisance odors off-Site. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor

controls, including the halt of work, will be the responsibility of the Applicant's Remediation Engineer, who is responsible for certifying the Final Engineering Report.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical deodorants in spray or misting systems; and (f) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved, as appropriate, by a combination of, applying odor suppressants and when necessary if the odor suppressants are not working, sheltering the excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-Site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-Site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water truck sprinkling.

Other Nuisances

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work. A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to local noise control standards.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Since residual contaminated groundwater and soil vapor could potentially remain beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) could potentially be required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of residual contamination, if required, will be executed under a Site-specific SMP that will be developed and included in the FER. However, a SSDS cannot be an engineering control for soil vapor because the planned foundation is in the groundwater table. The building design itself mitigates the soil vapor risk because there is an open-air garage under all of the residential living spaces. The potential for residual off-site vapor intrusion will be mitigated via the soil vapor barrier under the foundation and up the side walls to prevent any off-site migration.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination.

The FER will report residual contamination on the Site in tabular and map form. This will include presentations of exceedances of both Track 1 and Track 4 sites.

7.0 ENGINEERING CONTROLS

7.1 GROUNDWATER MONITORING SYSTEM AND CRITERIA FOR COMPLETION

The goal of the groundwater remedy is to achieve the TOGS AWQS standards or to reach asymptotic levels since it may not be possible to achieve the TOGS AWQS standards for every contaminant, particularly naturally occurring metals, given the surrounding urban environment in the Village of Port Chester and area-wide groundwater contamination conditions. Post-remediation groundwater sampling will be conducted in order to demonstrate that no additional groundwater remediation is required because the conditions have reached asymptotic levels. The current groundwater monitoring well network is presented in **Figure 2.1**. Wells that are damaged or lost during the remediation will be replaced or repaired for post-remediation sampling.

7.2 VAPOR BARRIER

Based on the proposed Track 1 soil source removal effort and groundwater concentrations, and the planned construction of the building in the groundwater table and with a one-story open-air garage level, soil vapor intrusion cannot occur on-Site. A vapor barrier is being installed to prevent any potential for off-site migration of residual soil vapor.

8.0 INSTITUTIONAL CONTROLS

In the event that the remedy does not achieve Track 1 unrestricted use, institutional controls in the form of an environmental easement will be imposed.

8.1 ENVIRONMENTAL EASEMENT

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. The Environmental Easement renders the Site a Controlled Property, and if required, will be recorded with the Westchester County Clerk before the Certificate of Completion is issued by NYSDEC.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Westchester County Clerk's Office before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both groups are closely integrated with the SMP, which provides all the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in the SMP;

- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- On-Site environmental monitoring devices, including but not limited to, soil vapor probes, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP; and,
- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited.
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose.
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted residential use only, provided the long-term Engineering and Institutional Controls included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as [restricted residential] use without an amendment or extinguishment of this Environmental Easement;

Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access

such Controlled Property at any time to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This statement must be certified by an expert that the NYSDEC finds acceptable.

8.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion for the Remedial Action. Since an SMP will likely be needed because of remaining groundwater monitoring likely to be required and the need for a soil vapor evaluation, it will be submitted for approval prior to the approval of the FER. Site Management will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH. The property owner is responsible for ensuring that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP is intended to provide a detailed description of the procedures required to manage the Site until an unconditional Track 1 unrestricted use is achieved. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of a Monitoring Plan and SVI Evaluation; (3) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (4) defining criteria for termination of monitoring. The SMP for this Site, if needed, will not require the development of a plan to operate and maintain treatment, collection, containment, or recovery systems because the only proposed ongoing remedy will be monitoring the wells and evaluating soil vapor intrusion.

To address these needs, this SMP will include three (3) plans as applicable: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site groundwater monitoring; and (3) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002, and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. A Periodic Review Report (PRR) will be submitted to the NYSDEC beginning 16 months after the Certificate of Completion is issued. After the initial PRR, the next PRR will be submitted annually to the NYSDEC.

The SMP and the FER will include a monitoring plan for groundwater at the upgradient and the downgradient Site perimeter to evaluate Site-wide performance of the remedy. Groundwater monitoring wells will be installed immediately downgradient of all remediation areas to monitor the natural attenuation. If the contaminants in groundwater do not attenuate below the Class GA AWQS concentrations or reach an asymptotic level that is accepted by the NYSDEC, an active treatment (e.g. oxidant injection) will be proposed and designed based on the monitoring data.

No exclusions for handling of remaining contaminated soils will be provided in the Site SMP. All handling of remaining contaminated material, to the extent a Track 1 soil remedy is not achieved, will be subject to Excavation Work Plan provisions contained in the SMP.

9.0 FINAL ENGINEERING REPORT

A FER and Site Management Plan will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The FER will include as-built drawings for all constructed elements, certifications, manifests, bills of landing as well as the complete Site Management Plan. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. Applicable analytical data collected under this RAWP will be accompanied by DUSRs in the FER. The FER will document that all applicable analytical data was submitted to and accepted by the Department in the Department's approved Electronic Data Deliverable format. The FER will be prepared in conformance with DER-10.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 UUSCO in 6NYCRR Part 375-6. A table that shows exceedances of Track 1 UUSCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER. A map that shows the location and summarizes exceedances of Track 1 UUSCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP, to the extent remaining, and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual

contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

9.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The certification will be signed by the Remedial Engineer, Fuad Dahan, who is a Professional Engineer registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I _____certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Work Plan was implemented and that all construction activities were completed in substantial conformance with the DER-approved Remedial Work Plan.

I certify that all use restrictions, institutional controls, engineering controls and/or any operation and maintenance requirements applicable to the site are contained in an environmental easement created and recorded pursuant to ECL 71-3605 and that any affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of any engineering controls employed at the site including the proper maintenance of any remaining monitoring wells, and that such plan has been approved by DER.

Figures



REFERENCE:

UNITED STATES GEOLOGICAL SURVEY (USGS)
GLENVILLE, CT USGS QUADRANGLE - 2021

LEGEND:

SITE LOCATION

SCALE: 1" = 2,000'

0 1,000 2,000 4,000 FEET

REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

SITE LOCATION MAP

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

FIG-1.1
DRAWN BY: KBV
CHECKED BY: MKC
SCALE: AS NOTED
DATE: 6/27/2025
JOB NO: 12123A

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Phase1_Prj_No.aprx, 6/27/2025 1:54 PM, Kim Vanderklein, LAYOUT: FIG-1.1



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NYS Education Law

Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

REFERENCE:

NEW YORK STATE, STATE OF CONNECTICUT, MAXAR, MICROSOFT, NYS OFFICE OF INFORMATION TECHNOLOGYSERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES

LEGEND:

- SUBJECT PROPERTY LOCATION
- NY TAX PARCELS

SCALE: 1" = 40'

0 20 40 80 FEET

dwg by: KBV
chk by: CM
scale: AS NOTED
date: 7/2/2025

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: **SUBJECT PROPERTY PLAN**

job no.: 12123A
drawing no: FIG-1.2

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Phase1_Prj_No.aprx, 7/2/2025 1:14 PM, Kim Vanderklein, LAYOUT: FIG-1.2



NOTE:
THIS PLAN IS FOR LOCATING POST-EXCAVATION SAMPLE LOCATIONS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION

REFERENCE:
BOUNDARY AND PROPOSED SITE CONDITIONS TAKEN FROM FOUNDATION PLAN, PREPARED BY LESSARD DESIGN IN. P.C. DATED 12/13/2024, REV 1/31/2025.

LEGEND:
- PROPOSED DEVELOPMENT FOOTPRINT
- SITE LOCATION

SCALE: 1" = 20'

0 10 20 40 FEET

NYS Education Law

Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

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dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 6/27/2025

project:
REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title:
PROPOSED DEVELOPMENT FOOTPRINT

job no.: 12123A
drawing no:
FIG-1.3

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 6/27/2025 12:20 PM, Kim Vanderklein, LAYOUT: FIG-5.1



NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION

NYS Education Law

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REFERENCE:
WELL LOCATIONS TAKEN FROM "MONITORING WELLS LOCATION SURVEY", PREPARED BY CONTRATORS' LINE AND GRADE SOURTH LLC, DATED 01/23/2025; PARCELS: NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES; AERIAL IMAGERY: NEW YORK STATE, STATE OF CONNECTICUT, MAXAR, MICROSOFT

NOTES:
1. MONITORING WELLS PLACEMENT IS BASED ON SURVEYED LOCATIONS PROVIDED BY SURVEY FROM "CONTRATORS' LINE AND GRADE SOUTH LLC".
2. ALL OTHER SAMPLE LOCATIONS ARE APPROXIMATE BASED ON FIELD DELINEATIONS.
3. BUILDINGS WERE PRESENT AT TIME OF FIELD WORK.
4. FLOOR DRAIN WAS SEALED AND SIGNIFICANT URINE WAS PRESENT; NO SAMPLE WAS OBTAINED.

LEGEND:

- FLOOR DRAIN SAMPLE NO. AND APPROX. LOCATION
- AMBIENT AIR SAMPLE NO. AND APPROX. LOCATION
- MONITORING WELL NO. AND APPROX. LOCATION
- SOIL BORING SAMPLE NO. AND APPROX. LOCATION
- SURFICIAL SOIL SAMPLE NO. AND APPROX. LOCATION; RI-SS1; RI-SS2; RI-SS3
- SOIL VAPOR NO. AND APPROX. LOCATION
- SITE LOCATION
- NY TAX PARCELS

SCALE: 1" = 20'

0 10 20 40 FEET

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 6/27/2025

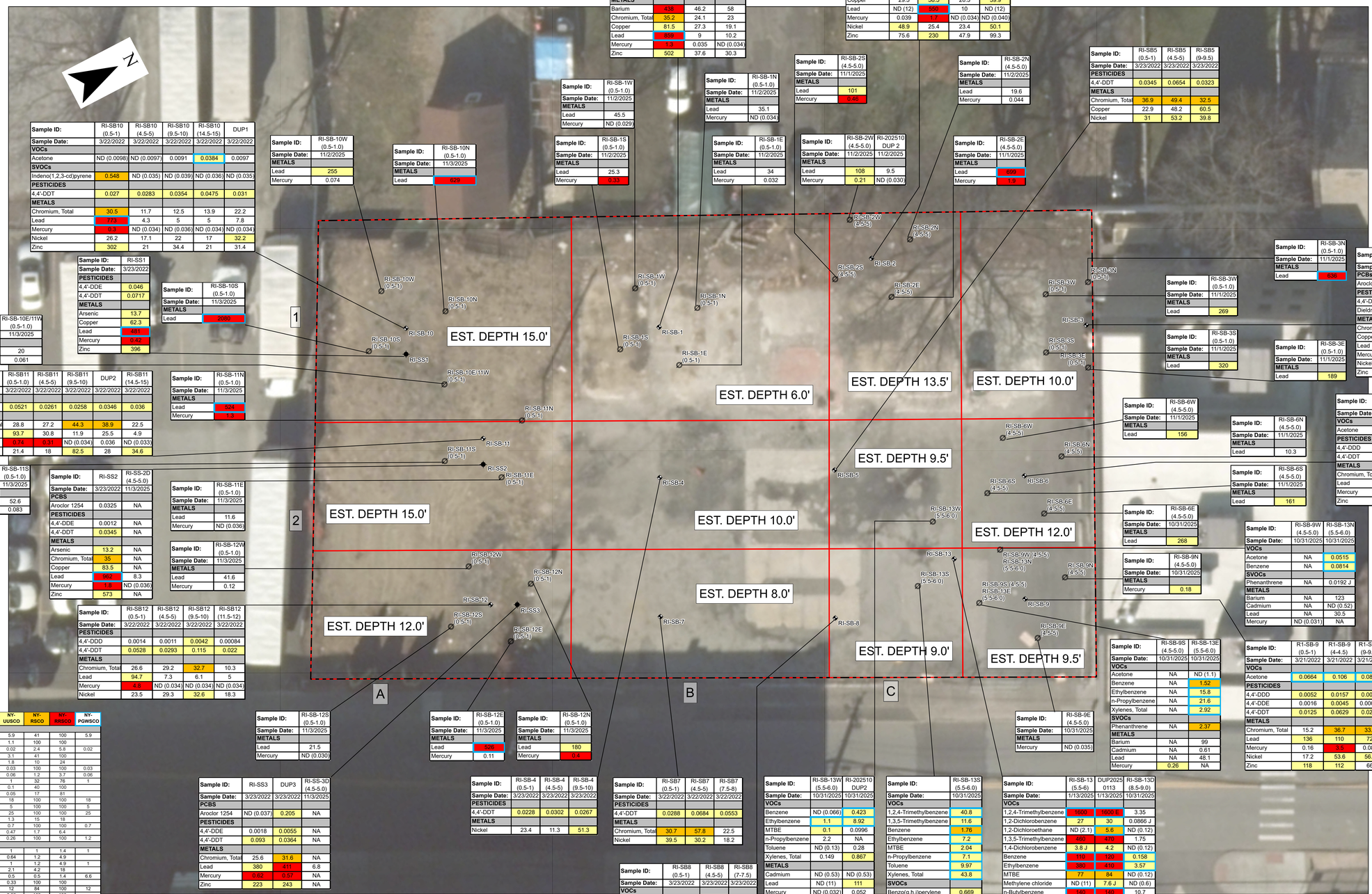
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project:
REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title:
RI SAMPLE LOCATION PLAN

job no.: 12123A
drawing no:
FIG-2.1

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 6/27/2025 1:35 PM, Kim Vanderklein, LAYOUT: FIG-4.1



Sample ID:	RI-SB1 (0.5-1)	RI-SB1 (4.5-5)	RI-SB1 (5.5-6)
Sample Date:	3/22/2022	3/22/2022	3/22/2022
VOCs			
Acetone	0.0347	ND (0.011)	0.016
PESTICIDES			
4,4'-DDT	0.0186 B	0.0345 B	0.0223 B
METALS			
Barium	438	46.2	58
Chromium, Total	35.2	24.1	23
Copper	81.5	27.3	19.1
Lead	859	9	10.2
Mercury	1.3	0.035	ND (0.034)
Zinc	502	37.6	30.3

Sample ID:	RI-SB2 (0.5-1)	RI-SB2 (4.5-5)	RI-SB2 (9.5-10.0)	RI-SB2 (13-13.5)
Sample Date:	3/23/2022	3/23/2022	3/23/2022	3/23/2022
PESTICIDES				
4,4'-DDT	0.0376	0.0866	0.0258	0.0578
METALS				
Chromium, Total	43.6	29.5	32.5	75.3
Copper	29.3	58.5	20.3	59.9
Lead	ND (12)	550	10	ND (12)
Mercury	0.039	1.7	ND (0.034)	ND (0.040)
Nickel	48.9	25.4	23.4	50.1
Zinc	75.6	230	47.9	99.3

Sample ID:	RI-SB5 (0.5-1)	RI-SB5 (4.5-5)	RI-SB5 (9-9.5)
Sample Date:	3/23/2022	3/23/2022	3/23/2022
PESTICIDES			
4,4'-DDT	0.0345	0.0654	0.0323
METALS			
Chromium, Total	36.9	49.4	32.5
Copper	22.9	48.2	60.5
Nickel	31	53.2	39.8

Sample ID:	RI-SB10 (0.5-1)	RI-SB10 (4.5-5)	RI-SB10 (9.5-10)	RI-SB10 (14.5-15)	DUP1
Sample Date:	3/22/2022	3/22/2022	3/22/2022	3/22/2022	3/22/2022
VOCs					
Acetone	ND (0.0098)	ND (0.0097)	0.0091	0.0384	0.0097
SVOCs					
Indeno(1,2,3-cd)pyrene	0.548	ND (0.035)	ND (0.039)	ND (0.036)	ND (0.035)
PESTICIDES					
4,4'-DDT	0.027	0.0283	0.0354	0.0475	0.031
METALS					
Chromium, Total	30.5	11.7	12.5	13.9	22.2
Lead	773	4.3	5	5	7.8
Mercury	0.3	ND (0.034)	ND (0.036)	ND (0.034)	ND (0.034)
Nickel	26.2	17.1	22	17	32.2
Zinc	302	21	34.4	21	31.4

Sample ID:	RI-SB-10W (0.5-1.0)
Sample Date:	11/2/2025
METALS	
Lead	255
Mercury	0.074

Sample ID:	RI-SB-10N (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	629

Sample ID:	RI-SB-1W (0.5-1.0)
Sample Date:	11/2/2025
METALS	
Lead	45.5
Mercury	ND (0.029)

Sample ID:	RI-SB-1S (0.5-1.0)
Sample Date:	11/2/2025
METALS	
Lead	25.3
Mercury	0.33

Sample ID:	RI-SB-1N (0.5-1.0)
Sample Date:	11/2/2025
METALS	
Lead	35.1
Mercury	ND (0.034)

Sample ID:	RI-SB-1E (0.5-1.0)
Sample Date:	11/2/2025
METALS	
Lead	34
Mercury	0.032

Sample ID:	RI-SB-2S (4.5-5.0)
Sample Date:	11/1/2025
METALS	
Lead	101
Mercury	0.46

Sample ID:	RI-SB-2W (4.5-5.0)	RI-202510 DUP 2
Sample Date:	11/2/2025	11/2/2025
METALS		
Lead	108	9.5
Mercury	0.21	ND (0.030)

Sample ID:	RI-SB-2N (4.5-5.0)
Sample Date:	11/2/2025
METALS	
Lead	19.6
Mercury	0.044

Sample ID:	RI-SB-2E (4.5-5.0)
Sample Date:	11/1/2025
METALS	
Lead	699
Mercury	1.9

Sample ID:	RI-SS1
Sample Date:	3/23/2022
PESTICIDES	
4,4'-DDE	0.046
4,4'-DDT	0.0717
METALS	
Arsenic	13.7
Copper	62.3
Lead	451
Mercury	0.42
Zinc	396

Sample ID:	RI-SB-10S (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	2080

Sample ID:	RI-SB-10E/11W (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	20
Mercury	0.061

Sample ID:	RI-SB11 (0.5-1.0)	RI-SB11 (4.5-5)	RI-SB11 (9.5-10)	DUP2	RI-SB11 (14.5-15)
Sample Date:	3/22/2022	3/22/2022	3/22/2022	3/22/2022	3/22/2022
PESTICIDES					
4,4'-DDT	0.0521	0.0261	0.0258	0.0346	0.036
METALS					
Chromium, Total	28.8	27.2	44.3	38.9	22.5
Lead	93.7	30.8	11.9	25.5	4.9
Mercury	0.74	0.31	ND (0.034)	0.036	ND (0.033)
Nickel	21.4	18	82.5	28	34.6

Sample ID:	RI-SB-11N (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	524
Mercury	1.3

Sample ID:	RI-SB-11S (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	52.6
Mercury	0.083

Sample ID:	RI-SS2	RI-SS-2D (4.5-5.0)
Sample Date:	3/23/2022	11/3/2025
PCBS		
Aroclor 1254	0.0325	NA
PESTICIDES		
4,4'-DDE	0.0012	NA
4,4'-DDT	0.0345	NA
METALS		
Arsenic	13.2	NA
Chromium, Total	35	NA
Copper	83.5	NA
Lead	962	8.3
Mercury	1.8	ND (0.036)
Zinc	573	NA

Sample ID:	RI-SB-11E (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	11.6
Mercury	ND (0.036)

Sample ID:	RI-SB-12W (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	41.6
Mercury	0.12

Sample ID:	RI-SB12 (0.5-1)	RI-SB12 (4.5-5)	RI-SB12 (9.5-10)	RI-SB12 (11.5-12)
Sample Date:	3/22/2022	3/22/2022	3/22/2022	3/22/2022
PESTICIDES				
4,4'-DDD	0.0014	0.0011	0.0042	0.00084
4,4'-DDT	0.0528	0.0293	0.115	0.022
METALS				
Chromium, Total	26.6	29.2	32.7	10.3
Lead	94.7	7.3	6.1	5
Mercury	4.8	ND (0.034)	ND (0.034)	ND (0.034)
Nickel	23.5	29.3	32.6	18.3

Sample ID:	RI-SB-12S (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	21.5
Mercury	ND (0.030)

Sample ID:	RI-SB-12E (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	526
Mercury	0.11

Sample ID:	RI-SB-12N (0.5-1.0)
Sample Date:	11/3/2025
METALS	
Lead	180
Mercury	0.4

Sample ID:	RI-SS3	DUP3	RI-SS-3D (4.5-5.0)
Sample Date:	3/23/2022	3/23/2022	11/3/2025
PCBS			
Aroclor 1254	ND (0.037)	0.205	NA
PESTICIDES			
4,4'-DDE	0.0018	0.0055	NA
4,4'-DDT	0.093	0.0364	NA
METALS			
Chromium, Total	25.6	31.6	NA
Lead	380	411	6.8
Mercury	0.62	0.57	NA
Zinc	223	243	NA

Sample ID:	RI-SB-4 (0.5-1)	RI-SB-4 (4.5-5)	RI-SB-4 (9.5-10)
Sample Date:	3/23/2022	3/23/2022	3/23/2022
PESTICIDES			
4,4'-DDT	0.0228	0.0302	0.0267
METALS			
Nickel	23.4	11.3	51.3

Sample ID:	RI-SB7 (0.5-1)	RI-SB7 (4.5-5)	RI-SB7 (7.5-8)
Sample Date:	3/22/2022	3/22/2022	3/22/2022
PESTICIDES			
4,4'-DDT	0.0288	0.0684	0.0553
METALS			
Chromium, Total	30.7	57.8	22.5
Nickel	39.5	30.2	18.2

Sample ID:	RI-SB8 (0.5-1)	RI-SB8 (4.5-5)	RI-SB8 (7-7.5)
Sample Date:	3/23/2022	3/23/2022	3/23/2022
VOCs			
Acetone	0.0067	0.0511	ND (0.72)
Ethylbenzene	ND (0.00095)	0.0043	6.79
Xylenes, Total	ND (0.00095)	0.0005	0.516
PESTICIDES			
4,4'-DDT	0.0337	0.0371	0.0411
METALS			
Chromium, Total	26.8	47	89.6
Lead	81.8	36.3	39.9
Nickel	21.6	61.4	59.5
Zinc	286	109	57.8

Sample ID:	RI-SB-13W (5.5-6.0)	RI-202510 DUP2
Sample Date:	10/31/2025	10/31/2025
VOCs		
Benzene	ND (0.066)	0.423
Ethylbenzene	1.1	8.92
MTBE	0.1	0.0996
n-Propylbenzene	2.2	NA
Toluene	ND (0.13)	0.28
Xylenes, Total	0.149	0.867
METALS		
Cadmium	ND (0.53)	ND (0.53)
Lead	ND (11)	111
Mercury	ND (0.032)	0.052

Sample ID:	RI-SB-13S (5.5-6.0)
Sample Date:	10/31/2025
VOCs	
1,2,4-Trimethylbenzene	40.8
1,3,5-Trimethylbenzene	11.6
Benzene	1.76
Ethylbenzene	7.2
MTBE	2.04
n-Propylbenzene	7.1
Toluene	9.97
Xylenes, Total	43.8
SVOCs	
Benzo(g,h,i)perylene	0.669
M&p cresol	3.03
Naphthalene	33.1
O-cresol	1.1
Phenanthrene	3.3
Phenol	4.04
METALS	
Cadmium	ND (0.53)
Lead	1010

Sample ID:	RI-SB-13 (5.5-6)	DUP2025 0113	RI-SB-13D (8.5-9.0)
Sample Date:	1/13/2025	1/13/2025	10/31/2025
VOCs			
1,2,4-Trimethylbenzene	1600	1600 J	3.35
1,2-Dichlorobenzene	27	30	0.0866 J
1,2-Dichloroethane	ND (2.1)	5.6	ND (0.12)
1,3,5-Trimethylbenzene	460	470	1.75
1,4-Dichlorobenzene	3.8 J	4.2	ND (0.12)
Benzene	110	120	0.158
Ethylbenzene	380	410	3.57
MTBE	77	84	ND (0.12)
Methylene chloride	ND (11)	7.6 J	ND (0.6)
n-Butylbenzene	140	140	10.7
n-Propylbenzene	210	222	27.9
sec-Butylbenzene	38	40	4.7
Tetrachloroethene	9.3	10	ND (0.24)
Toluene	820	829	0.763
Trichloroethene	15	13	ND (0.12)
Xylenes, Total	2300	2300	5.06
SVOCs			
Benzo(a)anthracene	7.9 J	7.3 J	0.0192 J
Benzo(g,h,i)perylene	11 J	8.7 J	ND (0.033)
Chrysene	9.2 J	8 J	0.0124 J
Dibenzofuran	ND (32)	3.2 J	0.323
M&p cresol	65	47 J	ND (0.067)
Naphthalene	410	430	0.235
O-cresol	23 J	20 J	ND (0.067)
Phenanthrene	31	31	0.664
Phenol	83	60	ND (0.067)
METALS			
Barium	392	434	102
Cadmium	5.62 J	3.37	ND (0.54)
Lead	2720	5300	7.3
Zinc	822	619	NA

Sample ID:	RI-SB-3W (0.5-1.0)
Sample Date:	11/1/2025
METALS	
Lead	269

Sample ID:	RI-SB-3S (0.5-1.0)
Sample Date:	11/1/2025
METALS	
Lead	320

Sample ID:	RI-SB-3N (0.5-1.0)
Sample Date:	11/1/2025
METALS	
Lead	636

Sample ID:	RI-SB-3E (0.5-1.0)
Sample Date:	11/1/2025
METALS	
Lead	189

Sample ID:	RI-SB3 (0.5-1)	RI-SB3 (4.5-5)	RI-SB3 (9.5-10)
Sample Date:	3/23/2022	3/23/2022	3/23/2022
PCBs			
Aroclor 1260	0.454	ND (0.037)	ND (0.035)
PESTICIDES			
4,4'-DDT	0.0422	0.0241	0.0224
Dieldrin	0.0054	ND (0.00075)	ND (0.0007)
METALS			
Chromium, Total	33.3	44.4	39.4
Copper	80.1	32.8	52.9
Lead	464	23.2	ND (11)
Mercury	0.27	0.14	ND (0.035)
Nickel	30.7	28.7	59.7
Zinc	267	62.5	51.8

Sample ID:	RI-SB-6W (4.5-5.0)
Sample Date:	11/1/2025
METALS	
Lead	156

Sample ID:	RI-SB-6N (4.5-5.0)
Sample Date:	11/1/2025
METALS	
Lead	10.3

Sample ID:	RI-SB-6S (4.5-5.0)
Sample Date:	11/1/2025
METALS	
Lead	161

Sample ID:	RI-SB-6E (4.5-5.0)
Sample Date:	10/31/2025
METALS	
Lead	268

Sample ID:	RI-SB-9N (4.5-5.0)
Sample Date:	10/31/2025
METALS	
Mercury	0.18

Sample ID:	RI-SB-9W (4.5-5.0)	RI-SB-13N (5.5-6.0)
Sample Date:	10/31/2025	10/31/2025
VOCs		
Acetone	NA	0.0515
Benzene	NA	0.0814
SVOCs		
Phenanthrene	NA	0.0192 J
METALS		
Barium	NA	123
Cadmium	NA	ND (0.52)
Lead	NA	30.5
Mercury	ND (0.031)	NA

Sample ID:	RI-SB-9S (4.5-5.0)	RI-SB-13E (5.5-6.0)
Sample Date:	10/31/2025	10/31/2025
VOCs		
Acetone	NA	ND (1.1)
Benzene	NA	1.52
Ethylbenzene	NA	15.8
n-Propylbenzene	NA	21.6
Xylenes, Total	NA	2.92
SVOCs		
Phenanthrene	NA	2.37
METALS		
Barium	NA	99
Cadmium	NA	0.61
Lead	NA	48.1
Mercury	0.26	NA

Sample ID:	RI-SB-9E (4.5-5.0)
Sample Date:	10/31/2025
METALS	
Mercury	ND (0.035)

Sample ID:	R1-SB-6 (0.5-1)	R1-SB-6 (4.5-5)	R1-SB-6 (9.5-10)	R1-SB-6 (11.5-12)
Sample Date:	3/21/2022	3/21/2022	3/21/2022	3/21/2022
VOCs				
Acetone	0.0501	ND (0.012)	0.0135	ND (0.014)
PESTICIDES				
4,4'-DDD	0.0051	0.0029	0.00082	0.0018
4,4'-DDT	0.023	0.0277	0.0343	0.0221
METALS				
Chromium, Total	27.4	30.9	42.9	27
Lead	210	420	48.9	7.2
Mercury	0.37	0.25	0.13	ND (0.036)
Zinc	140	566	88.1	52.8

Sample ID:	RI-SB-9W (0.5-1)	RI-SB-9 (4-4.5)	RI-SB-9 (9-9.5)
Sample Date:	3/21/2022	3/21/2022	3/21/2022
VOCs			
Acetone	0.0664	0.106	0.0835
PESTICIDES			
4,4'-DDD	0.0052	0.0157	0.0059
4,4'-DDE	0.0016	0.0045	0.00083
4,4'-DDT	0.0125	0.0629	0.0228
METALS			
Chromium, Total	15.2	36.7	33.1
Lead	136	110	72
Mercury	0.16	3.5	0.081
Nickel	17.2	53.6	56.2
Zinc	118	112	66

ANALTE:	UNITS	NY-UUSCO	NY-RSCO	NY-RRSCO	NY-PGWSCO
VOCS (SW846 8260D)					
1,2,4-Trimethylbenzene	mg/kg	5.9	41	100	5.9
1,2-Dichlorobenzene	mg/kg	1.1	100	100	
1,2-Dichloroethane	mg/kg	0.02	2.4	5.8	0.02
1,3,5-Trimethylbenzene	mg/kg	3.1	41	100	
1,4-Dichlorobenzene	mg/kg	1.8	10	24	
Acetone	mg/kg	0.03	100	100	0.03
Benzene	mg/kg	0.06	1.2	3.7	0.06
Ethylbenzene	mg/kg	1	32	76	1
Methyl tert butyl ether	mg/kg	0.1	40	100	
Methylene chloride	mg/kg	0.05	17	81	
n-Butylbenzene	mg/kg	12	100	100	18
n-Propylbenzene	mg/kg	9	100	100	5
sec-Butylbenzene	mg/kg	25	100	100	25
Tetrachloroethene	mg/kg	1.3	15	18	
Toluene	mg/kg	0.7	100	100	0.7
Trichloroethene	mg/kg	0.47	1.7	6.4	
Xylenes, Total	mg/kg	0.26	100	100	1.2
SVOCS (SW846 8270E)					
Benzo(a)anthracene	mg/kg	1	1	1.4	1
Benzo(g,h,i)perylene	mg/kg	0.64	1.2	4.9	
Chrysene	mg/kg	1	1.2	4.9	1
Dibenzofuran	mg/kg	2.1	4.2	18	
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	0.5	1.4	6.6
M&p cresol	mg/kg	0.33	100	100	
Naphthalene	mg/kg	12	84	100	12
O-cresol	mg/kg	0.33	100	100	
Phenanthrene	mg/kg	1.1	1.2	4.9	
Phenol	mg/kg	0.33	100	100	0.33
PCBS (SW846 8082A)					
Aroclor 1254	mg/kg	0.1	1	1	
Aroclor 1260	mg/kg	0.1	1	1	
PESTICIDES (SW846 8081B)					
4,4'-DDD	mg/kg	0.0033	1.2	5	14
4,4'-DDE	mg/kg	0.0033	0.78	3.4	9.3
4,4'-DDT	mg/kg	0.0033	0.78	3.8	135
Dieldrin	mg/kg	0.005	0.017	0.075	0.1
METALS (SW846 7471B)					
Arsenic	mg/kg	13	16	16	
Barium	mg/kg	410	410	410	
Cadmium	mg/kg	2.5	2.5	2.5	
Chromium, Total	mg/kg	30	30	110	
Copper	mg/kg	50	280	280	
Lead	mg/kg	63	400	400	450
Mercury	mg/kg	0.18	0.3	0.3	
Nickel	mg/kg	30	87	320	
Zinc	mg/kg	109	1300	6600	

NOTES:
- = Concentration exceeds UUSCO.
- = Concentration exceeds RSCO.
- = Concentration exceeds RRSCO.
- = Concentration exceeds PGWSCO.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives (6 NYCRR 375 12/25).
RSCO = NYSDEC Residential Use Soil Cleanup Objectives w/CP-51 (10/10) (6 NYCRR 375 12/25).
RRSCO = NYSDEC Restricted Residential Use Soil Cleanup Objectives w/CP-51 (10/10) (6 NYCRR 375 12/25).
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives (6 NYCRR 375 12/25).
mg/kg = Milligrams per kilogram.
NA = Compound not analyzed.
ND = Compound not detected above the respective reporting limit.

NYS Education Law
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NOTE:
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REFERENCE:
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LEGEND:
- SOIL BORING SAMPLE NO. AND APPROX. LOCATION
- SURFICIAL SOIL SAMPLE NO. AND APPROX. LOCATION
- OCTOBER / NOVEMBER 2025 SOIL BORING SAMPLE NO. AND APPROX. LOCATION
- EXCAVATION GRIDS
- SITE BOUNDARY

SCALE: 1" = 10'
0 5 10 20 30 40 FEET

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Pl_No_asof11-21-25.aprx, 4/21/2026 3:15 PM, Kim Vanderklein, LAYOUT: FIG-5.1

rev	date	description	by

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 4/21/2026

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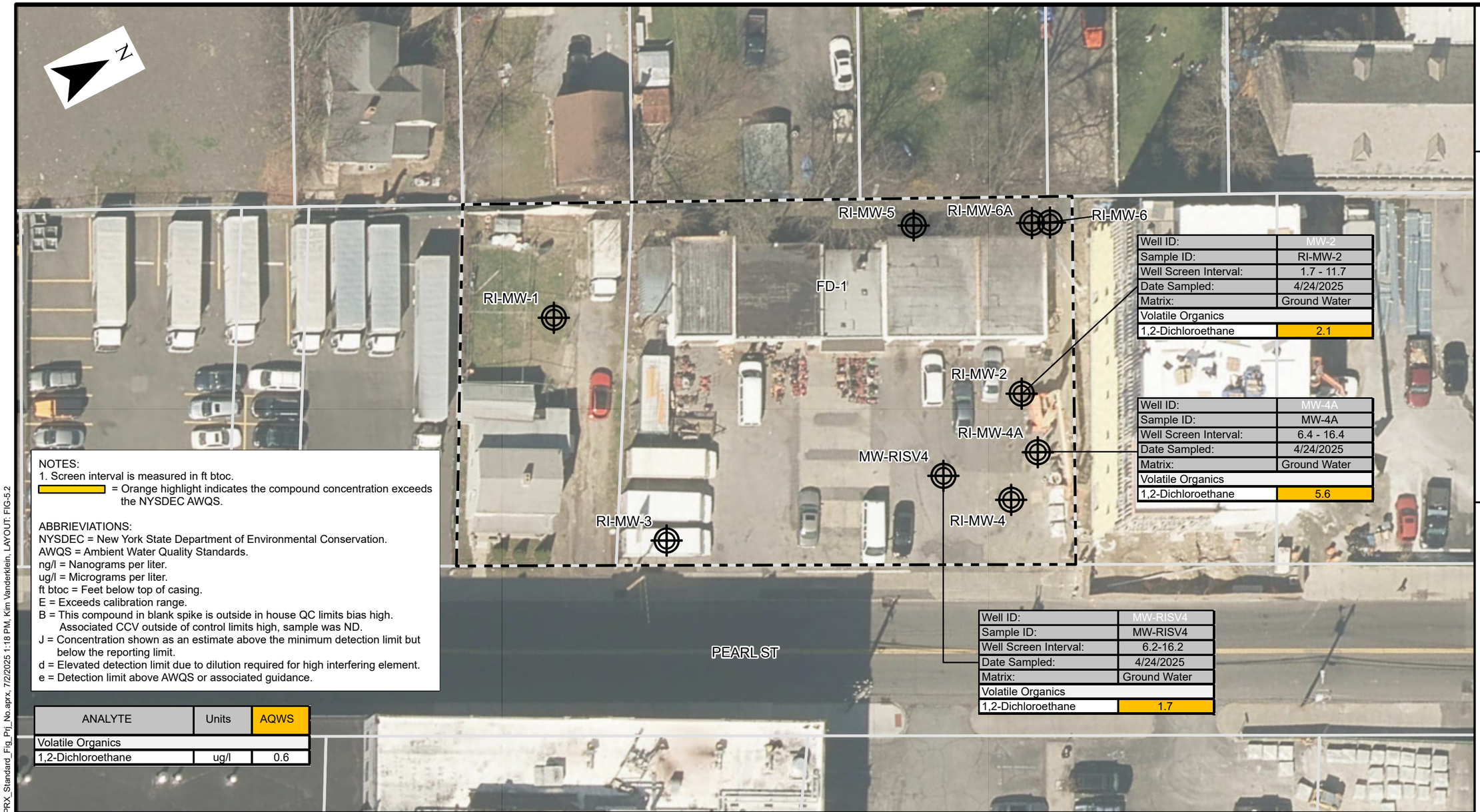
FUAD DAHAN, P.E.
PROFESSIONAL ENGINEER
N.Y.S.E. NO. 095571

project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: SOIL SAMPLING EXCEEDANCES AND EXCAVATION PLAN

job no.: 12123A
drawing no:

FIG-2.2



Well ID:	MW-2
Sample ID:	RI-MW-2
Well Screen Interval:	1.7 - 11.7
Date Sampled:	4/24/2025
Matrix:	Ground Water
Volatile Organics	
1,2-Dichloroethane	2.1

Well ID:	MW-4A
Sample ID:	MW-4A
Well Screen Interval:	6.4 - 16.4
Date Sampled:	4/24/2025
Matrix:	Ground Water
Volatile Organics	
1,2-Dichloroethane	5.6

Well ID:	MW-RISV4
Sample ID:	MW-RISV4
Well Screen Interval:	6.2-16.2
Date Sampled:	4/24/2025
Matrix:	Ground Water
Volatile Organics	
1,2-Dichloroethane	1.7

NOTES:
1. Screen interval is measured in ft btoc.
= Orange highlight indicates the compound concentration exceeds the NYSDEC AWQS.

ABBRIEVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
AWQS = Ambient Water Quality Standards.
ng/l = Nanograms per liter.
ug/l = Micrograms per liter.
ft btoc = Feet below top of casing.
E = Exceeds calibration range.
B = This compound in blank spike is outside in house QC limits bias high. Associated CCV outside of control limits high, sample was ND.
J = Concentration shown as an estimate above the minimum detection limit but below the reporting limit.
d = Elevated detection limit due to dilution required for high interfering element.
e = Detection limit above AWQS or associated guidance.

ANALYTE	Units	AQWS
Volatile Organics		
1,2-Dichloroethane	ug/l	0.6

NOTE:
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LEGEND:
- MONITORING WELL NO. AND APPROX. LOCATION
- SITE LOCATION
- NY TAX PARCELS

SCALE: 1" = 30'

0 15 30 60 FEET

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/2/2025

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project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: **GROUNDWATER SAMPLING EXCEEDANCES – CHLORINATED VOCS ONLY**

job no.: 12123A
drawing no:

FIG-2.3A

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 7/2/2025 1:18 PM, Kim Vanderklein, LAYOUT: FIG-5.2

ANALYTE	Units	AQWS
Volatile Organics		
1,2,4,5-Tetramethylbenzene	ug/l	5
1,2,4-Trimethylbenzene	ug/l	5
1,2-Dichloroethane	ug/l	0.6
2-Butanone	ug/l	50
Acetone	ug/l	50
Benzene	ug/l	1
Ethylbenzene	ug/l	5
Isopropylbenzene	ug/l	5
n-Butylbenzene	ug/l	5
n-Propylbenzene	ug/l	5
o-Xylene	ug/l	5
sec-Butylbenzene	ug/l	5
Toluene	ug/l	5
Xylenes, Total	ug/l	5
PFAS		
PFOS	ng/l	2.7
PFOA	ng/l	6.7
SVOCs		
2,4-Dimethylphenol	ug/l	1
Benzo(a)anthracene	ug/l	0.002
Benzo(a)pyrene	ug/l	0.002
Benzo(b)fluoranthene	ug/l	0.002
Chrysene	ug/l	0.002
Indeno(1,2,3-cd)pyrene	ug/l	0.002
Naphthalene	ug/l	10
Phenol	ug/l	1
Pesticides		
4,4'-DDT	ug/l	0.2
alpha-BHC	ug/l	0.01
Dieldrin	ug/l	0.004
Metals		
Iron	ug/l	300
Lead	ug/l	25
Manganese	ug/l	300
Selenium	ug/l	10
Sodium	ug/l	20000

Well ID:	MW-1	RI-MW-I
Sample ID:	MW-1	RI-MW-I
Well Screen Interval:	9.42 - 14.42	
Date Sampled:	3/23/2022	4/24/2025
Matrix:	Ground Water	Ground Water
PFAS		
PFOS	30.8	20.3
PFOA	28.9	28
Pesticides		
Dieldrin	ND (0.0057)	0.006 J
Metals		
Sodium	48200	47400

Well ID:	MW-5
Sample ID:	MW-5
Well Screen Interval:	2.09 - 12.09
Date Sampled:	3/22/2022
Matrix:	Ground Water
PFAS	
PFOS	29.1
PFOA	26.4
Pesticides	
4,4'-DDT	6.7 EB [d]
alpha-BHC	0.27 B [d]
Metals	
Iron	4850
Manganese	470
Selenium	10.1
Sodium	32500

Well ID:	MW-6A
Sample ID:	MW-6A
Well Screen Interval:	15.2 - 25.2
Date Sampled:	4/24/2025
Matrix:	Ground Water
PFAS	
PFOS	18.7
PFOA	34.3
SVOCs	
Benzo(a)anthracene	0.05 J
Metals	
Iron	15900
Manganese	1590
Sodium	22500

Well ID:	MW-2	
Sample ID:	RI-MW-2	RI-MW-2
Well Screen Interval:	1.7 - 11.7	
Date Sampled:	1/13/2025	4/24/2025
Matrix:	Ground Water	Ground Water
VOCs		
1,2-Dichloroethane	ND (0.5)	2.1
2-Butanone	ND (5)	64
Acetone	2.2 J	130
Benzene	ND (0.5)	42
Ethylbenzene	ND (2.5)	81
Isopropylbenzene	ND (2.5)	48
n-Butylbenzene	ND (2.5)	13
n-Propylbenzene	ND (2.5)	120
o-Xylene	ND (2.5)	7.5
sec-Butylbenzene	ND (2.5)	9.4
Toluene	ND (2.5)	32
Xylenes, Total	ND (2.5)	22
PFAS		
PFOS	38.7	39.2
PFOA	18.7	17
SVOCs		
2,4-Dimethylphenol	ND (12)	3.1 J
Benzo(a)anthracene	ND (0.25)	0.07 J
Benzo(a)pyrene	ND (0.25)	0.04 J
Benzo(b)fluoranthene	ND (0.25)	0.07 J
Chrysene	ND (0.25)	0.06 J
Indeno(1,2,3-cd)pyrene	ND (0.25)	0.05 J
Naphthalene	0.61	12
Phenol	ND (12)	4.8 J
Metals		
Iron	1150	8700
Manganese	121.5	907.6
Sodium	213000	485000

Well ID:	MW-4	
Sample ID:	MW-4A	MW-4A
Well Screen Interval:	6.4 - 16.4	
Date Sampled:	4/24/2025	4/24/2025
Matrix:	Ground Water	Ground Water
VOCs		
1,2,4,5-Tetramethylbenzene	39	-
1,2-Dichloroethane	5.6	-
2-Butanone	140	-
Acetone	250 E	180
Benzene	110	-
Ethylbenzene	120	-
Isopropylbenzene	59	-
n-Butylbenzene	13	-
n-Propylbenzene	130	-
o-Xylene	9.3	-
sec-Butylbenzene	8.4	-
Toluene	51	-
Xylenes, Total	37	-
PFAS		
PFOS	50.2	-
PFOA	13.8	-
SVOCs		
2,4-Dimethylphenol	15	-
Phenol	11	-
Metals		
Iron	12600	-
Lead	35.86	-
Manganese	2094	-
Sodium	496000	-

Well ID:	MW-RISV4
Sample ID:	MW-RISV4
Well Screen Interval:	6.2-16.2
Date Sampled:	4/24/2025
Matrix:	Ground Water
VOCs	
1,2,4,5-Tetramethylbenzene	130
1,2,4-Trimethylbenzene	40
1,2-Dichloroethane	1.7
2-Butanone	54
Acetone	90
Benzene	41
Ethylbenzene	170
Isopropylbenzene	100
n-Butylbenzene	30
n-Propylbenzene	270
o-Xylene	32
sec-Butylbenzene	20
Toluene	72
Xylenes, Total	110
PFAS	
PFOS	48.9
PFOA	17.4
SVOCs	
2,4-Dimethylphenol	3.6 J
Benzo(a)anthracene	0.08 J
Benzo(b)fluoranthene	0.04 J
Chrysene	0.04 J
Indeno(1,2,3-cd)pyrene	0.03 J
Naphthalene	18
Phenol	3.3 J
Metals	
Iron	33800
Lead	47.23
Manganese	952
Sodium	528000+N10:O37

Well ID:	MW-3
Sample ID:	MW-3
Well Screen Interval:	3.8 - 8.8
Date Sampled:	3/23/2022
Matrix:	Ground Water
PFAS	
PFOS	23.4
PFOA	22.7
Metals	
Iron	8370
Lead	35.6
Manganese	597
Sodium	46500

RI-MW-5
RI-MW-6A
RI-MW-6
RI-MW-1
FD-1
RI-MW-2
RI-MW-4A
MW-RISV4
RI-MW-3
RI-MW-4
PEARL ST

NOTES:
1. Screen interval is measured in ft btoc.
= Orange highlight indicates the compound concentration exceeds the NYSDEC AWQS.

ABBRIEVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
AWQS = Ambient Water Quality Standards.
PFOS = Perfluorooctanesulfonic acid
PFOA = Perfluorooctanoic acid
ng/l = Nanograms per liter.
ug/l = Micrograms per liter.
ft btoc = Feet below top of casing.
ND = Compound not detected above the respective reporting limit.
E = Exceeds calibration range.
B = This compound in blank spike is outside in house QC limits bias high. Associated CCV outside of control limits high, sample was ND.
J = Concentration shown as an estimate above the minimum detection limit but below the reporting limit.
d = Elevated detection limit due to dilution required for high interfering element.
e = Detection limit above AWQS or associated guidance.

NOTE:
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LEGEND:
- MONITORING WELL NO. AND APPROX. LOCATION
- SITE LOCATION
- NY TAX PARCELS

SCALE: 1" = 30'
0 15 30 60 FEET

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/2/2025

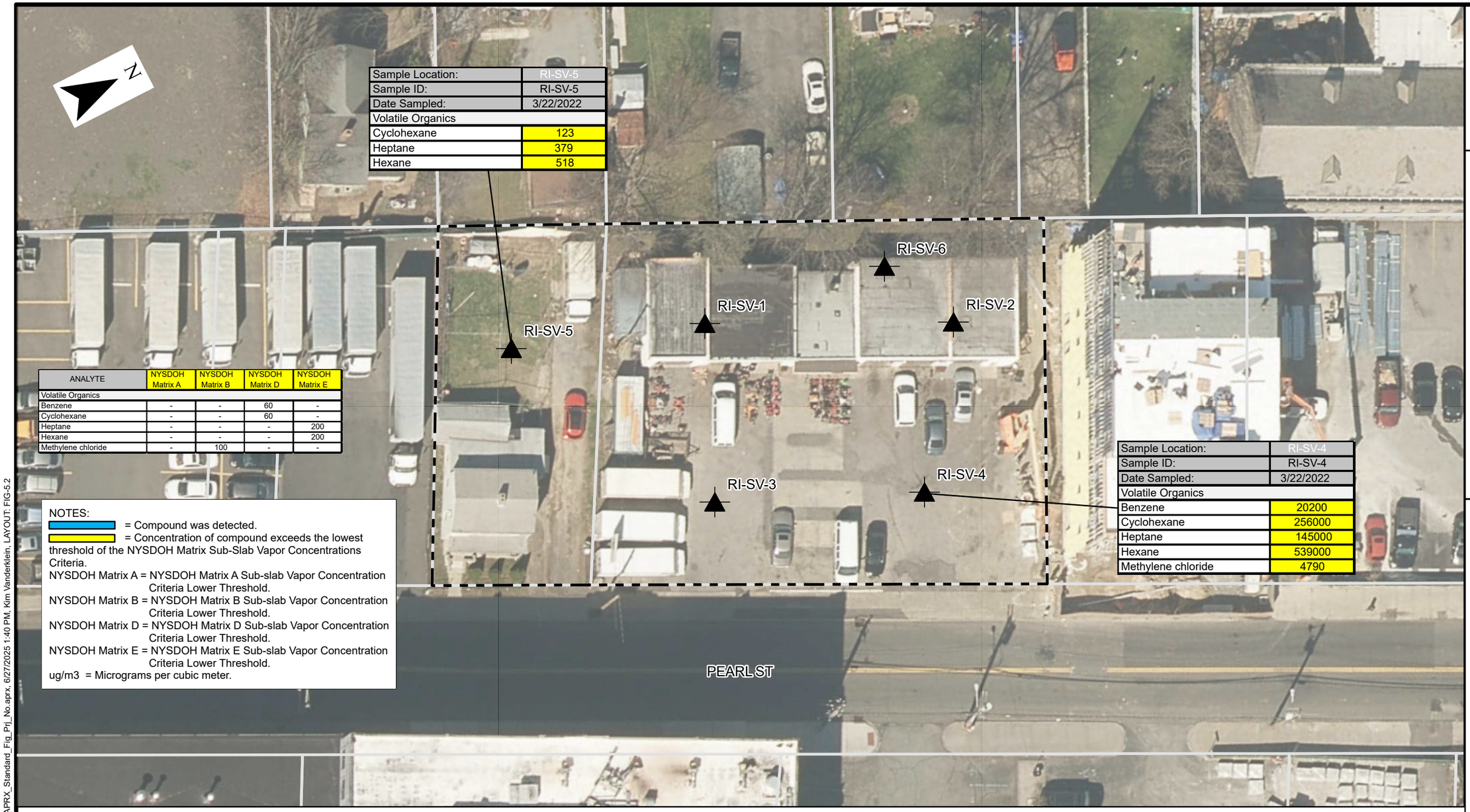
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project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: GROUNDWATER SAMPLING EXCEEDANCES – ALL ANALYTES

job no.: 12123A
drawing no:
FIG-2.3B

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 7/2/2025 1:21 PM, Kim VanderKlein, LAYOUT: FIG-5.2



Sample Location:	RI-SV-5
Sample ID:	RI-SV-5
Date Sampled:	3/22/2022
Volatile Organics	
Cyclohexane	123
Heptane	379
Hexane	518

Sample Location:	RI-SV-4
Sample ID:	RI-SV-4
Date Sampled:	3/22/2022
Volatile Organics	
Benzene	20200
Cyclohexane	256000
Heptane	145000
Hexane	539000
Methylene chloride	4790

ANALYTE	NYSDOH Matrix A	NYSDOH Matrix B	NYSDOH Matrix D	NYSDOH Matrix E
Volatile Organics				
Benzene	-	-	60	-
Cyclohexane	-	-	60	-
Heptane	-	-	-	200
Hexane	-	-	-	200
Methylene chloride	-	100	-	-

NOTES:
= Compound was detected.
= Concentration of compound exceeds the lowest threshold of the NYSDOH Matrix Sub-Slab Vapor Concentrations Criteria.
NYSDOH Matrix A = NYSDOH Matrix A Sub-slab Vapor Concentration Criteria Lower Threshold.
NYSDOH Matrix B = NYSDOH Matrix B Sub-slab Vapor Concentration Criteria Lower Threshold.
NYSDOH Matrix D = NYSDOH Matrix D Sub-slab Vapor Concentration Criteria Lower Threshold.
NYSDOH Matrix E = NYSDOH Matrix E Sub-slab Vapor Concentration Criteria Lower Threshold.
ug/m3 = Micrograms per cubic meter.

NOTE:
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LEGEND:
SOIL VAPOR NO. AND APPROX. LOCATION
SITE LOCATION
NY TAX PARCELS

SCALE: 1" = 30'
0 15 30 60 FEET

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 6/27/2025

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project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: **SOIL VAPOR SAMPLE LOCATIONS AND CONCENTRATIONS**

job no.: 12123A
drawing no: FIG-2.4

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 6/27/2025 1:40 PM, Kim Vanderklein, LAYOUT: FIG-5.2



NOTE:
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REFERENCE:
WELL LOCATIONS TAKEN FROM "MONITORING WELLS LOCATION SURVEY", PREPARED BY CONTRATORS' LINE AND GRADE SOURTH LLC, DATED 01/23/2025; PARCELS: NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES; AERIAL IMAGERY: CRCOG/STATE OF CT, CT GIS OFFICE, NEW YORK STATE, MICROSOFT, VANTOR

NOTES:
1. MONITORING WELLS PLACEMENT IS BASED ON SURVEYED LOCATIONS PROVIDED BY SURVEY FROM "CONTRATORS' LINE AND GRADE SOUTH LLC".
2. MONITORING WELLS RI-MW-4A, RI-MW-6A, AND RI-MWSV-4 ARE NOT SURVEYED. THE THREE POINTS SHOWN FOR THESE WELLS REPRESENT APPROXIMATE LOCATIONS.

LEGEND:

- RI-MW-1 — MONITORING WELL NO. AND APPROX. LOCATION
- INTERPOLATED GROUNDWATER CONTOURS
- SITE LOCATION
- NY TAX PARCELS

SCALE: 1" = 20'

0 10 20 40 FEET

- GROUNDWATER FLOW DIRECTION
- [50.59 FT] GROUNDWATER ELEVATION [FT AMSL]

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 2/27/2026

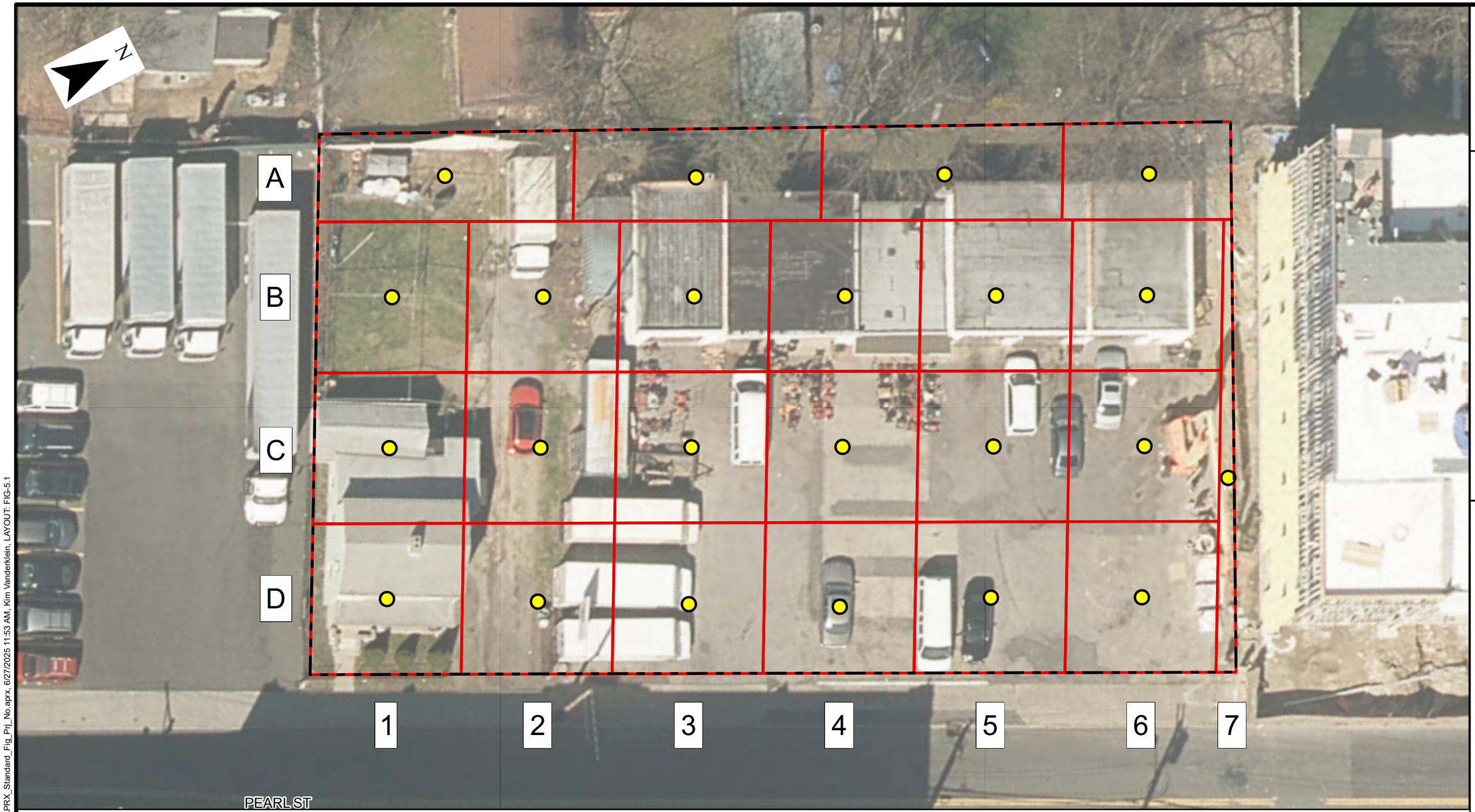
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project:
REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title:
GROUNDWATER CONTOUR PLAN

job no.: 12123A
drawing no:
FIG-2.5

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No_asof11-21-25 aprx, 2/27/2026 5:26 PM, Kim Vanderklein, LAYOUT: FIG-3.1



NOTE:
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LEGEND:

- PROPOSED POST EXCAVATION SOIL SAMPLE APPROX. LOCATIONS
- POST EXCAVATION SOIL SAMPLE GRID (900 SQ FT)
- SITE LOCATION

SCALE: 1" = 20'

0 10 20 40 FEET

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dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 6/27/2025

project: REMEDIAL ACTION WORKPLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title: **POST EXCAVATION SOIL SAMPLE LOCATION PLAN**

job no.: 12123A
drawing no:

FIG-5.1

Y:\GIS\Project_Numbers\12123A\APRX_PROJECT\APRX_Standard_Fig_Prj_No.aprx, 6/27/2025 11:53 AM, Kim Vanderklein, LAYOUT: FIG-5.1

Appendix A:

Conceptual Redevelopment Plans

28 PEARL STREET

PORT CHESTER, NY

PROJECT TEAM

ARCHITECT

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CIVIL:

ZONING ATTORNEY:

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MEP:

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INTERIOR DESIGN:



100% DESIGN DEVELOPMENT SUBMISSION

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SEAL & SIGNATURE:

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181 Westchester Avenue, Suite 301A
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28 Pearl Street
PORT CHESTER, NY

COVER SHEET

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:44:46 AM
FILE NAME:

CS-001

Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/SAC001A - ARCH - 28 Pearl Street.rvt

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
CS-001	COVER SHEET	•	•			
CS-002	DRAWING INDEX	•	•			
G-001	GRAPHIC STANDARDS, ABBREVIATIONS, VICINITY MAP, GENERAL NOTES	•	•			
G-002	UNIT TABULATIONS, UNIT MATRIX	•	•			
G-003	CODE ANALYSIS	•	•			
G-011	LIFESAFETY PLAN - CELLAR 2 / CELLAR 1	•	•			
G-012	LIFESAFETY PLAN - 1ST FLOOR / 2ND FLOOR	•	•			
G-013	LIFESAFETY PLAN - (3RD - 8TH) TYPICAL FLOOR / 9TH FLOOR	•	•			
G-014	LIFESAFETY PLAN - PENTHOUSE FLOOR / SECTION	•	•			
G-015	ACCESSIBLE ROUTE DIAGRAM	•	•			
G-016	FIRE SEPARATION DISTANCE / EXTERIOR FIRE RATING WALL PLAN	•	•			
G-020	ANSI MOUNTING HEIGHTS AND DESIGN CRITERIA	•	•			
G-021	ANSI MOUNTING HEIGHTS AND DESIGN CRITERIA	•	•			
G-022	FAIR HOUSING ACT - MOUNTING HEIGHTS AND DESIGN CRITERIA	•	•			
G-030	TYPICAL WALL ASSEMBLIES	•	•			
G-031	TYPICAL FLOOR / ROOF ASSEMBLIES	•	•			
G-031a	UL GUIDELINES					
G-031b	UL GUIDELINES					
G-031c	UL GUIDELINES					
G-031d	UL GUIDELINES					
G-031e	UL GUIDELINES					
G-031f	UL GUIDELINES					
G-031g	UL GUIDELINES					
G-043	SMACNA DETAILS					
G-044	FIRE STOP DETAILS					
G-045	FIRE STOP DETAILS					
G-046	TYPICAL FLASHING DETAILS					

GENERAL - SHEET COUNT: 27

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
A-001	ARCHITECTURAL SITE PLAN	•	•			
A-101	CELLAR 2 & CELLAR 1 FLOOR PLAN	•	•			
A-102	FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN	•	•			
A-103	2ND & TYPICAL (3RD-7TH) FLOOR PLAN	•	•			
A-104	8TH & 9TH FLOOR PLAN	•	•			
A-105	BUILDING ROOF & PENTHOUSE ROOF FLOOR PLAN	•	•			
A-131	CELLAR 2 & CELLAR 1 RCP	•	•			
A-132	FIRST FLOOR & UPPER ELEVATOR LOBBY RCP	•	•			
A-133	2ND & TYPICAL (3RD-7TH) RCP	•	•			
A-134	8TH & 9TH RCP	•	•			
A-135	BUILDING ROOF RCP	•	•			
A-141	CELLAR 2 & CELLAR 1 SLAB PLAN	•	•			
A-142	FIRST FLOOR & UPPER ELEVATOR LOBBY SLAB PLAN	•	•			
A-143	2ND & TYPICAL (3RD-7TH) SLAB PLAN	•	•			
A-144	8TH & 9TH SLAB PLAN	•	•			
A-145	BUILDING ROOF & PENTHOUSE ROOF SLAB PLAN	•	•			
A-201	PEARL STREET ELEVATION	•	•			
A-202	WEST ELEVATION	•	•			
A-203	NORTH / SOUTH ELEVATION	•	•			
A-301	BUILDING SECTION	•	•			
A-302	BUILDING SECTION	•	•			
A-303	BUILDING SECTION	•	•			
A-304	BUILDING SECTION	•	•			
A-311	BUILDING WALL SECTIONS	•	•			
A-312	BUILDING WALL SECTIONS	•	•			
A-313	BUILDING WALL SECTIONS	•	•			
A-314	BUILDING WALL SECTIONS	•	•			
A-315	BUILDING WALL SECTIONS	•	•			
A-316	BUILDING WALL SECTIONS	•	•			
A-400a	TYPICAL UNIT INTERIOR DETAILS	•	•			
A-400b	TYPICAL KITCHEN DETAILS	•	•			
A-400c	TYPICAL BATHROOM DETAILS	•	•			
A-401	UNIT PLAN (S1)	•	•			
A-401A	UNIT PLAN (S1)	•	•			
A-402	UNIT PLAN (S2)	•	•			
A-402A	UNIT PLAN (S2)	•	•			
A-403	UNIT PLAN (S3)	•	•			
A-403A	UNIT PLAN (S3)	•	•			
A-404	UNIT PLAN (A1)	•	•			
A-404A	UNIT PLAN (A1)	•	•			
A-405	UNIT PLAN (A2)	•	•			
A-405A	UNIT PLAN (A2)	•	•			
A-406	UNIT PLAN (A3)	•	•			
A-406A	UNIT PLAN (A3)	•	•			
A-407	UNIT PLAN (A4)	•	•			
A-407A	UNIT PLAN (A4)	•	•			
A-408	UNIT PLAN (CO)	•	•			
A-408A	UNIT PLAN (CO)	•	•			
A-409	UNIT PLAN (C1)	•	•			
A-409A	UNIT PLAN (C1)	•	•			
A-410	UNIT PLAN (C2)	•	•			
A-410A	UNIT PLAN (C2)	•	•			
A-500	TYPICAL INTERIOR DETAILS		•			
A-510	TYPICAL DETAILS		•			
A-520	TYPICAL WINDOW DETAILS @ BRICK VENEER		•			
A-521	TYPICAL WINDOW DETAILS @ METAL PANEL		•			
A-522	TYPICAL STOREFRONT DETAILS @ BRICK / METAL PANEL		•			
A-523	TYPICAL GARAGE SCREEN / EXHAUST VENT DETAILS		•			
A-524	TYPICAL BALCONY DOOR / BALCONY DETAIL		•			
A-530	EXTERIOR WALL PLAN DETAILS		•			
A-531	EXTERIOR WALL PLAN DETAILS		•			
A-540	EXTERIOR WALL SECTION DETAILS - FOUNDATION / 1ST - AVG. GRADE LEVEL		•			
A-541	EXTERIOR WALL SECTION DETAILS - BELOW PODIUM LEVEL		•			
A-542	EXTERIOR WALL SECTION DETAILS - BELOW PODIUM LEVEL		•			
A-543	EXTERIOR WALL SECTION DETAILS - ROOF / PARAPET		•			
A-544	CANOPY DETAILS		•			
A-601	DOOR SCHEDULE	•	•			
A-602	WINDOW AND STOREFRONT SCHEDULE	•	•			
A-701	STAIR 1 - PLANS & SECTIONS	•	•			
A-702	STAIR 2 - PLANS & SECTIONS	•	•			
A-703	TYPICAL STAIR DETAILS @ METAL / CONCRETE	•	•			
A-704	RAMP - PLANS & SECTIONS	•	•			
A-711	ELEVATOR 1 & 2 - PLAN & SECTIONS / DETAILS	•	•			
A-721	TRASH CHUTE - ENLARGED PLANS & SECTION DETAILS	•	•			
A-730	TRANSFORMER ROOM - PLAN & INTERIOR ELEVATIONS	•	•			

ARCHITECTURAL - SHEET COUNT: 75

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
S-100	GENERAL NOTES & DESIGN CRITERIA	•	•			
S-101	SPECIAL INSPECTIONS	•	•			
S-200	FOUNDATION PLAN	•	•			
S-201	TYPICAL FOUNDATION DETAILS-1	•	•			
S-202	TYPICAL FOUNDATION DETAILS-2	•	•			
S-203	COLUMN SCHEDULE & DETAILS	•	•			
S-300	FIRST FLOOR FRAMING PLAN	•	•			
S-301	UPPER FIRST FLOOR PARKING LEVEL FRAMING PLAN	•	•			
S-302	SECOND FLOOR FRAMING PLAN	•	•			
S-400	TYPICAL CONCRETE FRAMING DETAILS-1	•	•			
S-401	TYPICAL CONCRETE FRAMING DETAILS-2	•	•			
S-402	TYPICAL CONCRETE FRAMING DETAILS-3	•	•			
S-403	TYPICAL CONCRETE FRAMING DETAILS-5	•	•			
S-404	TYPICAL MASONRY DETAILS	•	•			
S-500	3RD THRU 9TH FLOOR FRAMING PLAN	•	•			
S-501	ROOF FRAMING PLAN	•	•			
S-502	PENTHOUSE ROOF FRAMING PLAN	•	•			
S-600	TYPICAL FRAMING SECTIONS	•	•			
S-601	TYPICAL FRAMING SECTIONS	•	•			
S-700	SHEAR WALL DETAILS	•	•			
S-800	TYPICAL LIGHT GAUGE CONNECTION DETAILS-1	•	•			
S-801	TYPICAL LIGHT GAUGE CONNECTION DETAILS-2	•	•			

STRUCTURAL - SHEET COUNT: 22

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
M-001	COVER SHEET	•	•			
M-101	CELLAR 2 & CELLAR 1 FLOOR PLANS	•	•			
M-102	FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN	•	•			
M-103	2ND & TYPICAL (3RD-7TH) FLOOR PLAN	•	•			
M-104	8TH & 9TH FLOOR PLAN	•	•			
M-105	BUILDING ROOF & PENTHOUSE ROOF PLAN	•	•			
M-201	TYPICAL UNIT PLANS	•	•			
M-301	SCHEDULES		•			
M-302	SCHEDULES		•			
M-401	DETAILS		•			
M-402	DETAILS		•			
M-403	DETAILS		•			

MECHANICAL - SHEET COUNT: 12

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
P-001	COVER SHEET	•	•			
P-100	FOUNDATION PLAN	•	•			
P-101	CELLAR 2 & CELLAR 1 FLOOR PLAN	•	•			
P-102	FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN	•	•			
P-103	2ND & TYPICAL (3RD-7TH) FLOOR PLAN	•	•			
P-104	8TH & 9TH FLOOR PLAN	•	•			
P-105	BUILDING ROOF & PENTHOUSE ROOF PLAN	•	•			
P-201	TYPICAL UNIT PLANS	•	•			
P-601	FIXTURE & EQUIPMENT SCHEDULES		•			
P-701	DETAILS		•			
P-702	DETAILS		•			
P-703	DETAILS		•			

PLUMBING - SHEET COUNT: 12

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
E-001	COVER SHEET	•	•			
E-002	NOTES	•	•			
E-101	CELLAR 2 & CELLAR 1 FLOOR POWER PLANS	•	•			
E-102	FIRST FLOOR & UPPER ELEVATOR LOBBY POWER PLAN	•	•			
E-103	2ND & TYPICAL (3RD-7TH) FLOOR POWER PLAN	•	•			
E-104	8TH & 9TH FLOOR POWER PLAN	•	•			
E-105	BUILDING ROOF & PENTHOUSE ROOF POWER PLAN	•	•			
E-301	TYPICAL UNIT POWER PLANS	•	•			
E-501	POWER RISER DIAGRAM (1 OF 2)	•	•			
E-502	POWER RISER DIAGRAM (2 OF 2)	•	•			
E-503	POWER RISER NOTES & FEEDER SCHEDULE	•	•			
E-504	FIRE ALARM RISER DIAGRAM	•	•			
E-505	TELECOM RISER DIAGRAM	•	•			
E-506	FIRE ALARM ERRCS RISER DIAGRAM		•			
E-601	PANEL SCHEDULE		•			
E-701	DETAILS (1 OF 3)	•	•			
E-702	DETAILS (2 OF 3)	•	•			
E-703	DETAILS (3 OF 3)	•	•			

ELECTRICAL - SHEET COUNT: 18

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
FP-001	COVER SHEET	•	•			
FP-101	CELLAR 2 & CELLAR 1 FLOOR PLAN	•	•			
FP-102	FIRST FLOOR & UPPER ELEVATOR LOBBY FLOOR PLANS	•	•			
FP-103	2ND & TYPICAL (3RD-7TH) FLOOR PLANS	•	•			
FP-104	8TH & 9TH FLOOR PLANS	•	•			
FP-105	BUILDING ROOF	•	•			
FP-201	TYPICAL UNITS PLANS	•	•			
FP-701	DETAILS		•			
FP-702	DETAILS		•			

FIRE PROTECTION - SHEET COUNT: 9

SHEET NUMBER	SHEET NAME	12/13/2023 - 25% DD SUBMISSION	01/31/2025 - 100% DD SUBMISSION			
ID-000	FINISH SCHEDULE					
ID-101	LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - ENLARGED FLOOR PLAN & RCP	•	•			
ID-102	LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - INTERIOR ELEVATIONS	•	•			
ID-103	LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - INTERIOR ELEVATIONS	•	•			
ID-104	LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - INTERIOR MILLWORK DETAILS					
ID-201	FITNESS CENTER - ENLARGED FLOOR PLAN & RCP	•	•			
ID-202	FITNESS CENTER - INTERIOR ELEVATIONS	•	•			
ID-203	FITNESS CENTER - INTERIOR MILLWORK DETAILS					
ID-301	CLUB HOUSE - ENLARGED FLOOR PLAN	•	•			
ID-302	CLUB HOUSE - ENLARGED RCP	•	•			
ID-303	CLUB HOUSE - INTERIOR ELEVATIONS	•	•			
ID-304	CLUB HOUSE - INTERIOR MILLWORK DETAILS					
ID-401	ELEV. LOBBY - ENLARGED FLOOR PLAN	•	•			
ID-402	ELEV. LOBBY - ENLARGED RCP PLAN	•	•			
ID-501	CORRIDOR - ENLARGED FLOOR PLAN	•	•			
ID-502	CORRIDOR - ENLARGED RCP PLAN	•	•			
ID-503	CORRIDOR - INTERIOR ELEVATIONS	•	•			
ID-601	MECH. / GEN. / STAIR ACC. / REST. - ENLARGED FLOOR PLAN	•	•			
ID-602	MECH. / GEN. / STAIR ACC. / REST. - ENLARGED RCP PLAN	•	•			
ID-603	MECH. / GEN. / STAIR ACC. / REST. - INTERIOR ELEVATION	•	•			

INTERIOR DESIGN - SHEET COUNT: 20

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28 Pearl Street
PORT CHESTER, NY

DRAWING INDEX

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 3:03:20 PM
FILE NAME:

CS-002

Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKG001A - ARCH - 28 Pearl Street.rvt

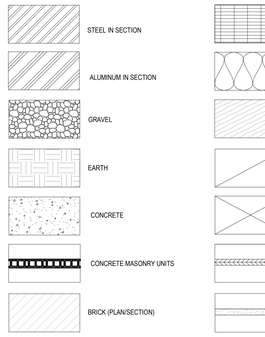
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ABBREVIATIONS

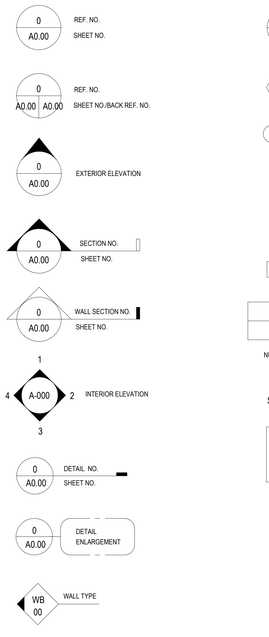
A/E	ARCHITECT-ENGINEER*	FN	FENCE*	POL	POLISHED
AB	ANCHOR BOLT	FOC	FACE OF CONCRETE*	POLY	POLYETHYLENE*
ABC	AGGREGATE BASE COURSE*	FOF	FACE OF FINISH*	POS	POSITIVE
ABRSV	ABRASIVE	FOM	FACE OF MASONRY*	PR	PAIR
ABV	ABOVE	FOS	FACE OF STUDS*	PRCST	PRECAST
AC	AIR CONDITIONING	FPL	FIREPLACE*	PREFAB	PREFABRICATED
ACOUS	ACOUSTICAL*	FPRF	FIREPROOFING	PREFIN	PREFINISHED*
ACOUS INSUL	ACOUSTICAL INSULATION	FR	FIRE RATING*	PRELIM	PRELIMINARY
ACR PL	ACRYLIC PLASTIC*	FSTNER	FASTENER	PRKG	PARKING*
AD	ACCESS DOOR*	FTG	FOOTING	PROJ	PROJECT
AD	AREA DRAIN	FUR	FURNACE	PROP	PROPERTY
ADDL	ADDITIONAL*	FURR	FURRING*	PS CONC	PRESTRESSED CONCRETE*
ADDM	ADDENDUM*	FUT	FUTURE	PSF	POUNDS PER SQUARE FOOT
ADH	ADHESIVE	FWC	FABRIC WALL COVERING*	PSI	POUNDS PER SQUARE INCH
ADJ	ADJUSTABLE	FXTR	FIXTURE	PT	PRESERVATIVE TREATED
ADJC	ADJACENT*			PTD	PAPER TOWEL DISPENSER*
AFF	ABOVE FINISH FLOOR*	G	GAS	PTN	PARTITION
AFG	ABOVE FINISH GRADE*	GA	GAGE	PVMT	PAVEMENT*
AFS	ABOVE FINISH SLAB*	GAL	GALLON		
AGGR	AGGREGATE	GALV	GALVANIZED	QT	QUARRY TILE*
AL	ALUMINUM	GALVS	GALVANIZED STEEL	QTR	QUARTER
ALT NO	ALTERNATE NUMBER*	GB	GRAB BAR*		
ANOD	ANODIZED*	GD	GUTTER DRAIN*	R	RISER
ANT	ANTENNA	GDR	GUARD RAIL	RA	RETURN AIR*
AP	ACCESS PANEL	GEN	GENERATOR	RA GR	RETURN AIR GRILLE*
APT	APARTMENT	GENL CONTR	GENERAL CONTRACT	RAD	RADIUS
ARCH	ARCHITECT (URAL)	GIP	GALVANIZED IRON PIPE*	RBR	RUBBER
ASC	ABOVE SUSPENDED CEILING*	GL	GLASS	RC	REINFORCED CONCRETE
ASPH	ASPHALT	GL BLK	GLASS BLOCK*	RD	ROAD
ASSY	ASSEMBLY	GLU LAM	GLUE LAMINATED*	RD	ROOF DRAIN
		GLZ	GLAZING	REC	RECESSED
B	BATHROOM*	GLZ CMU	GLAZED CONCRETE MASONRY UNIT*	RECPT	RECEPTACLE
B/B	BACK TO BACK*	GR BM	GRADE BEAM*	RECT	RECTANGULAR
BAF	BAFFLE	GRIL	GRILLE	REF	REFERENCE
BB	BASEBOARD*	GRTG	GRATING	REINF	REINFORCE (D) (ING) (MENT)
BC	BACK OF CURB*	GSKT	GASKET	REM	REMOVABLE
BD	BOARD	GSNK	GOOSENECK*	REQD	REQUIRED
BETW	BETWEEN	GT	GROUT*	RES	RESIDENT
BEV	BEVEL	GUT	GUTTER	RESIL	RESILIENT
BF	BOTH FACES*	GVL	GRAVEL	REST	REST ROOM
BF	BOTTOM FACES	GYP	GYPSUM	RET	RETURN*
BITUM	BITUMINOUS	GYP BD	GYPSUM BOARD*	RFG	ROOFING
BL	BASE LINE			RH	RIGHT HAND
BLDG	BUILDING	HA	HANDICAPPED-ACCESSIBLE	RHR	RIGHT HAND REVERSE*
BLK	BLOCK	HB	HOSE BIB	RLF	RELIEF
BLKG	BLOCKING	HC	HOLLOW CORE*	RLG	RAILING
BLW CLG	BELOW CEILING*	HC	HANDICAPPED	RM	ROOM
BLW FFLR	BELOW FINISH FLOOR*	HCMU	HOLLOW CONCRETE MASONRY UNIT*	RND	ROUND
BM	BEAM			RO	ROUGH OPENING
BM	BENCH MARK	HDBD	HARDBOARD*	ROW	RIGHT OF WAY*
BOT	BOTTOM	HDR	HEADER	RV	ROOF VENT*
BP	BASE PLATE	HDWD	HARDWOOD*	RVS	REVERSE
BR	BEDROOM	HDWE	HARDWARE*	RWL	RAIN WATER LEADER*
BRCG	BRACING*	HEX	HEXAGONAL	S	SOUTH
BRDG	BRIDGING*	HGR	HANGER	SA	SUPPLY AIR*
BRDG JST	BRIDGING JOIST*	HGT	HEIGHT	SB	SPLASH BLOCK
BRG	BEARING	HM	HOLLOW METAL	SCHED	SCHEDULE
BRG PL	BEARING PLATE*	HMD	HOLLOW METAL DOOR*	SCMU	SOLID CONCRETE MASONRY UNIT*
BRK	BRICK	HMF	HOLLOW METAL FRAME		
BRKT	BRACKET	HNDRL	HANDRAIL	SD	SOAP DISPENSER
BS	BOTH SIDES	HORIZ	HORIZONTAL	SD	STORM DRAIN*
BSMT	BASEMENT	HVAC	HEATING, VENTILATION, AIR	SDL	SADDLE
BU	BUILT-UP*	HWH	HOT WATER HEATER	SECT	SECTION
BUR	BUILT-UP ROOF*			SEG	SEGMENT
BW	BOTH WAYS	ICC	IMPACT INSULATION CLASS	SERV	SERVICE
		ID	INSIDE DIAMETER	SGL	SINGLE
C/C	CENTER TO CENTER*	IF	INSIDE FACE*	SHR	SHOWER*
CAB	CABINET	INL	INLET	SHT	SHEET (ING)*
CEM	CEMENT	INSTL	INSTALLATION	SHTGH	SHEATHING
CER TILE	CERAMIC TILE*	INSUL	INSULATION	SHV	SHELVES (ING)
CFLG	COUNTER FLASHING	INSUL PNL	INSULATION PANEL*	SIM	SIMILAR
CHAN	CHANNEL	INTERCOM	INTERCOMMUNICATION	SJ	SCORED JOINT*
CHFR	CHAMFER*	INTR	INTERIOR	SK	SINK
CI	CAST IRON	INVL EL	INVERT ELEVATION*	SLP	SLOPE
CIP	CAST IRON PIPE	IP	IRON PIPE	SLV	SLEEVE
CJ	CONSTRUCTION JOINT	ISO	ISOMETRIC	SM	SHEET METAL*
CL	CENTER LINE	JC	JANITOR'S CLOSET	SMLS	SEAMLESS
CLG	CEILING	JST	JOIST*	SND	SANITARY NAPKIN DISPENSER
CLG HT	CEILING HEIGHT	JT	JOINT	SNR	SANITARY NAPKIN RECEPTACLE
CLG REG	CEILING REGISTER				
CLJ	CONTROL JOINT	KIT	KITCHEN*	SPEC	SPECIFICATION
CLO	CLOSET	KOP	KNOCKOUT PANEL	SPKLR	SPRINKLER*
CMU	CONCRETE MASONRY UNIT			SPLY	SUPPLY
CNTR	COUNTER	LAU	LAUNDRY	SQ FT	SQUARE FOOT
CO	CASED OPENING*	LAV	LAVATORY	SQ IN	SQUARE INCH
COL	COLUMN	LB	POUND	SSK	SERVICE SINK
CONC	CONCRETE	LBL	LABEL	SST	STAINLESS STEEL
CONC FL	CONCRETE FLOOR*	LBR	LUMBER	STA	STATION
COND	CONDENSER (ATE)_	LD BRG	LOAD BEARING*	STAG	STAGGERED*
CONN	CONNECTION	LDG	LANDING	STC	SOUND TRANSMISSION CLASS*
CONSTR	CONSTRUCTION	LDR	LEADER	STD	STANDARD
CONT	CONTINUOUS (ATION)	LF	LINEAR FOOT*	STIF	STIFFENER
CONTR	CONTRACT (OR)	LNGE	LOUNGE	STIR	STIRRUP
COORD	COORDINATE	LH	LEFT HAND	STK	STAKE*
CORR	CORRIDOR*	LHR	LEFT HAND REVERSE*	STL	STEEL
CPA	COMPACTOR	LIN	LINEAR	STL JST	STEEL JOIST*
CRN	CROWN	LKR	LOCKER	STL PL	STEEL PLATE*
CS	CAST STONE	LKR RM	LOCKER ROOM*	STOR	STORAGE
CSB	CASING BEAD*	LL	LIVE LOAD	STRUCT	STRUCTURAL*
CSB	CONCRETE SPLASH BLOCK	LNTL	LINTEL	SUSP	SUSPENDED
CSG	CASING	LONG	LONGITUDINAL	SUSP CLG	SUSPENDED CEILING*
CSK	COUNTERSUNK*	LP	LIGHT POLE*	SW	SIDEWALK*
CSMT	CASEMENT*	LPT	LOW POINT*	SYM	SYMBOL
CSWK	CASEWORK*	LR	LIVING ROOM*	SYMM	SYMMETRICAL
CTV	CABLE TELEVISION*	LT	LIGHT		
		LT WT	LIGHTWEIGHT	T	TREAD*
DBL ACT	DOUBLE ACTING	LTG	LIGHTING	T&B	TOP AND BOTTOM
DBL GLZ	DOUBLE GLAZING	LVL	LEVEL (ER)	T&G	TONGUE AND GROOVE
DCL	DOOR CLOSURE	LVR	LOUVER	TB	TOP OF BEAM*
DEMO	DEMOLITION*	LWC	LIGHTWEIGHT CONCRETE	TB	TOWEL BAR*
DET	DETAIL	M	METER*	TC	TOP OF CONCRETE*
DF	DRINKING FOUNTAIN	MAINT	MAINTENANCE	TC	TOP OF CURB*
DFR	DOOR FRAME*	MAN	MANUAL*	TD	TOWEL DISPENSER*
DH	DOUBLE HUNG	MAS	MASONRY*	TD	TRENCH DRAIN*
DIFF	DIFFERENCE	MATL	MATERIAL	TE	TOP ELEVATION*
DIM	DIMENSION	MATV	MASTER ANTENNA TELEVISION SYSTEM*	TECH	TECHNICAL
DJ	DOUBLE JOIST*			TEL	TELEPHONE
DL	DEAD LOAD	MAX	MAXIMUM	TEMP	TEMPERATURE
DLV	DOOR LOUVER	MBR	MASTER BEDROOM*	TEMP	TEMPORARY
DMPF	DAMPPROOFING	MC	MEDICINE CABINET	TEN	TENANT
DN	DOWN	MECH	MECHANICAL	TF	TOP OF FOOTING*
DO	DITTO	MED	MEDIUM*	TFA	TO FLOOR ABOVE*
DR	DINING ROOM	MEMB	MEMBRANE	TFB	TO FLOOR BELOW
DR	DRAIN	MET	METAL	TFF	TO OF FINISH FLOOR*
DRW	DRY WELL*	METB	METAL BASE	THK	THICKNESS*
DS	DOWNSPOUT	MEZZ	MEZZANINE	THRES	THRESHOLD*
DSP	DRY STANDPIPE*	MFG	MANUFACTURING	THRU	THROUGH
DST	DOOR STOP	MH	MANHOLE	TJ	TOP OF JOIST*
DT	DRAIN TILE	MIN	MINIMUM	TEMPD GL	TEMPERED GLASS*
DVTL	DOVETAIL	MIR	MIRROR	TOS	TOP OF SLAB
DW	DISHWASHER	MISC	MISCELLANEOUS	TOT	TOTAL
DWG	DRAWING	ML	METAL LATH*	TOW	TOP OF WALL
DWL	DOWEL	MLDG	MOLDING	TP	TOP OF PAVEMENT*
DWR	DRAWER	MLWK	MILLWORK*	TPH	TOILET PAPER HOLDER*
DX	DUPLEX	MO	MASONRY OPENING	TST	TOP OF STEEL*
		MTD	MOUNTED	TV	TELEVISION
E	EAST	MTG	MOUNTING	TYP	TYPICAL
ECR	ELEVATOR CONTROL ROOM	MULL	MULLION*	UGND	UNDERGROUND
EF	EACH FACE	MULT	MULTIPLE	UNFIN	UNFINISHED
EIFS	EXTERIOR INSULATION FINISH SYSTEM			UNO	UNLESS NOTED OTHERWISE*
EL	EASEMENT LINE*	N	NORTH	UR	URINAL
EL	ELEVATION	NA	NOT APPLICABLE	VB	VINYL BASE*
ELB	ELBOW	NEG	NEGATIVE	VCT	VINYL COMPOSITION TILE*
ELEC	ELECTRICAL	NIC	NOT IN CONTRACT	VERT	VERTICAL
ELEV	ELEVATOR	NO	NUMBER	VEST	VESTIBULE
EMP	EMPLOYEE	NOM	NOMINAL	VIF	VERIFY IN FIELD
ENCL	ENCLOSURE	NTS	NOT TO SCALE	VIN	VINYL*
ENGR	ENGINEER			VOL	VOLUME
ENTR	ENTRANCE	O/O	OUT TO OUT*	VR	VAPOR RETARDER
EO	ELECTRICAL OUTLET*	OA	OVERALL	VT	VINYL TILE*
EP	EDGE OF PAVEMENT*	OC	ON CENTER	VWC	VINYL WALL COVERING*
EP	ELECTRICAL PANEL*	OD	OUTSIDE DIAMETER		
EQL SP	EQUALLY SPACED	OD	OUTSIDE DIMENSION*	W	WEST
EQUIP	EQUIPMENT*	OF	OUTSIDE FACE	W	WITH
EQUIV	EQUIVALENT	OFCI	OWNER FURNISHED - CONTRACTOR	W/O	WITHOUT
ESMT	EASEMENT*	OFOI	OWNER FURNISHED - OWNER INSTALLED	WW	WALL TO WALL*
EW	EACH WAY			WC	WATER CLOSET
EXH	EXHAUST	OPNG	OPENING	WD	WOOD
EXH FN	EXHAUST FAN*	OPP	OPPOSITE	WDSP	WASTE DISPOSER*
EXH GR	EXHAUST GRILLE*	OPT	OPTIONAL*	WDW	WINDOW*
EXH HD	EXHAUST HOOD*	ORIG	ORIGINAL	WF	WIDE FLANGE*
EXH RG	EXHAUST REGISTER*	OS	OVERFLOW SCUPPER	WGL	WIRE GLASS
EXP	EXPANSION	OVHD	OVERHEAD	WH	WALL HUNG
EXP BT	EXPANSION BOLT*	OZ	OUNCE	WHTR	WATER HEATER
EXP JT	EXPANSION JOINT			WI	WROUGHT IRON
EXST	EXISTING	PACK	PACKAGE	WL	WIND LOAD
EXT	EXTERIOR	PARG	PARGING	WLD	WELDED
		PBD	PARTICLEBOARD*	WR	WATER RESISTANT*
F BRK	FIRE BRICK*	PC	POINT OF CURVE	WS	WEATHERSTRIPPING
FF	FINISH TO FINISH	PC	PULL CHAIN*	WSCT	WAINSCOT*
FB	FIRE BLANKET*	PCD	PAPER CUP DISPENSER	WTRPRF	WATERPROOFING*
FB	FLAT BAR	PED	PEDESTAL	WWF*	WELDED WIRE FABRIC*
FBD	FIBERBOARD*	PERF	PERFORATED		
FD	FLOOR DRAIN	PERIM	PERIMETER*	X SECT	CROSS SECTION
FDN	FOUNDATION	PERM	PERMANENT	XFMR	TRANSFORMER
FEXT	FIRE EXTINGUISHER	PERP	PERPENDICULAR		
FFA	FROM FLOOR ABOVE*	PI	POINT OF INTERSECTION		
FFB	FROM FLOOR BELOW	PKWY	PARKWAY		
FGL	FIBERGLASS	PL	PLATE		
FHY	FIRE HYDRANT	PL	PROPERTY LINE		
FIN	FINISH*	PLAM	PLASTIC LAMINATE*		
FIN FL	FINISH FLOOR*	PLAS	PLASTER		
FIN GR	FINISH GRADE	PLAT	PLATFORM*		
FL	FLASHING	PLBG	PLUMBING*		
FLDG	FOLDING	PLF	POUNDS PER LINEAR FOOT*		
FLG	FLANGE	PLYWD	PLYWOOD		
FLR	FLOOR (ING)*	PNL	PANEL		
FLR FIN	FLOOR FINISH	PNT	PAINT		
FLR PL	FLOOR PLATE*				
FLR REG	FORMBOARD				
FMBD	FLOOR PLATE*				

NOTE: AN ASTERISK (*) INDICATES THE TERM IS NOT IN ANSI Y1.1 OR THAT THE ABBREVIATION SHOWN IS NOT IN COMPLIANCE WITH THE ONE SHOWN IN ANSI Y1.1. THE ABSENCE OF AN ASTERISK INDICATES THE ABBREVIATION AGREES WITH ANSI Y1.1

GRAPHIC REPRESENTATION



GRAPHIC SYMBOLS



GENERAL NOTES:

1. CONTRACTOR SHOULD VISIT AND BECOME FAMILIAR WITH THE SITE PRIOR TO BIDDING.
2. COORDINATE AND SECURE OWNER'S AGREEMENT FOR ACCESS TO SITE CONSTRUCTIONS, STAGING AREAS AND STORAGE REQUIREMENTS.
3. PROVIDE ALL WORK IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES, REGULATIONS AND ANY ADDITIONAL REQUIREMENTS SO STATED BY ANY LAW, ORDINANCE OR REGULATION PERTAINING TO CONSTRUCTION WITHIN THE SAID LIMITS OF THE JURISDICTION
4. ACCOMPLISH ALL CONSTRUCTION IN COMPLIANCE WITH THE OCCUPATIONAL, SAFETY AND HEALTH ACT AND OTHER APPLICABLE RULES AND REGULATIONS. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY AND LIABILITY FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS PERTAINING TO THE HEALTH AND SAFETY OF PERSONNEL DURING THE EXECUTION OF WORK, AND SHALL HOLD THE OWNER AND ARCHITECT HARMLESS OF ANY ACTION ON HISHER PART OR THAT OF HISHER EMPLOYEES OR SUBCONTRACTORS, WHICH RESULTS IN ILLNESS, INJURY OR DEATH. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COMPLY WITH ALL SUCH LAWS AND REGULATIONS.
5. COORDINATE CONSTRUCTION ACTIVITIES TO ASSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF WORK
6. MAINTAIN SURFACE STREET AND SURFACE PARKING AREAS IN A CLEAN CONDITION. MUD, DEBRIS AND DUST FREE AT ALL TIMES AND PROVIDE ADEQUATE MEANS TO CLEAN TRUCKS AND OTHER EQUIPMENT USING SURFACED STREETS AND PARKING AREAS.
7. INFORM OWNER AND ARCHITECT OF CONDITIONS WHICH MAY AFFECT THE CONSTRUCTION AS SHOWN.
8. BRING TO THE ATTENTION OF THE OWNER ANY MATERIAL SUSPECTED OF BEING HAZARDOUS ENCOUNTERED DURING EXECUTION OF THE WORK. A DETERMINATION WILL BE MADE BY THE OWNER AS TO WHETHER THE CONTRACTOR SHALL PERFORM TEST TO DETERMINE IF THE MATERIAL IS HAZARDOUS.
9. PROTECT EXISTING ADJACENT AREAS FROM DAMAGE DURING EXECUTION OF THE WORK. REPLACE ALL ITEMS DAMAGED DURING THE WORK AT THE CONTRACTORS EXPENSE.
10. REFER TO PLUMBING DRAWINGS FOR LOCATION OF OPENINGS FOR PLUMBING FIXTURES.
11. REFER TO M.E.P. DRAWINGS FOR LOCATION AND COORDINATION OF KITCHENS, BATHROOMS, DRYER AND FIRE PLACES VENTS AND FLUES.
12. UPON COMPLETION OF WORK, REMOVE TOOLS, EQUIPMENT, TEMPORARY PROTECTION AND EXCESS MATERIALS FROM SITE. REMOVE ALL PAINT DRIPS/ SPLATTERS, CLEAN/ POLISH ALL HARDWARE AND FIXTURES. REMOVE PROTECTION AND LEAVE INTERIOR AREAS BROOM CLEAN AND FREE OF STAINS, FILM AND SIMILAR FOREIGN SUBSTANCES.
13. PROVIDE CONTINUOUS SEALANT AT ALL JOINTS BETWEEN DISSIMILAR MATERIALS OR CONSTRUCTION.
14. FOR PIPE PENETRATIONS ON RATED WALLS OR FLOOR/ CEILING ASSEMBLY. REFER TO DETAILS SHEET G-044 & G-045.
15. SHOULD DISCREPANCIES BE DISCOVERED BETWEEN DETAILS AND/OR PLANS. IT WILL BE THE CONTRACTORS RESPONSIBILITY TO ASK THE QUESTION THAT RESOLVES THE DISCREPANCY BEFORE PROCEEDING WITH ANY WORK, OTHERWISE THE CONTRACTOR WILL BE RESPONSIBLE FOR CORRECTING THE DISCREPANCY AT THEIR OWN COST. THE QUESTION SHALL BE IN FORM OF AN RFI WITH SUGGESTION INCLUDED.

VICINITY PLAN

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GRAPHIC STANDARDS, ABBREVIATIONS, VICINITY MAP, GENERAL NOTES

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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28 PEARL STREET - BUILDING TABULATIONS

UNIT TYPE																
Name	Type	Unit SF	Cellar 2	Cellar 1	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	TOTAL	Units Per Type	Approximate Average SF	%
A-1	1BR, 1BA	763				3	3	3	3	3	3	3	1	22			
A-2	1BR, 1BA	598				1	1	1	1	1	1	1	1	8	**49**	742	35.0%
A-3	1BR+DEN, 2BA	955						1	2	2	2	2	2	11			
A-4	1BR, 1BA	535				1	1	1	1	1	1	1	1	8			
C-0	2BR,2BA	955				2	2	1						5			
C-1	2BR,2BA	853				2	2	2	2	2	2	2	2	16	**37**	942	26.4%
C-2	2BR,2BA	1,026				2	2	2	2	2	2	2	2	16			
S-1	STUDIO	574				3	3	3	3	3	3	3	3	24			
S-2	STUDIO	579					2	2	2	2	2	2	2	14	**54**	569	38.6%
S-3	STUDIO	552				2	2	2	2	2	2	2	2	16			
Units Per Floor						**16**	**18**	**18**	**18**	**18**	**18**	**18**	**16**	**140**		727.91	100.0%
Net Area Per Floor						11,916	13,074	13,074	13,074	13,074	13,074	13,074	11,548	**101,908**			
Circulation/Mech			509	403	936	843	2,014	2,014	2,014	2,014	2,014	2,003	461	15,225			
Lobby / Leasing / Amenity					1,158	1,166							1,534	3,858			
***Residential Gross Area Per Floor**			**509**	**403**	**2,094**	**13,925**	**15,088**	**15,088**	**15,088**	**15,088**	**15,088**	**15,077**	**13,543**	**120,991**			
Average Gross Area per unit														864			
Average Net Area per unit														728			
Building Efficiency						85.6%	86.7%	86.7%	86.7%	86.7%	86.7%	86.7%	85.3%	**86.4%**			
Parking Garage Area (Gross SF)			**10,276**	**7,967**	**9,023**									**27,266**			
Handicap Parking					2									2	2.2%	(min. 2%)	
Compact Parking			7	19										26	28.9%	(max. 30%)	
Standard Parking			26	8	28									62			
Residential Parking			**33**	**27**	**30**									**90**			
Garage Parking Ratio														0.64			

*Gross Area on Cellars and Ground floor doesn't count toward Building Efficiency

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28 Pearl Street
PORT CHESTER, NY

UNIT TABULATIONS, UNIT MATRIX

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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GROSS BUILDING AREA	
LEVEL	AREA TOTAL
CELLAR 2	11169 SF
CELLAR 1	9347 SF
1ST	17615 SF
2ND	15445 SF
3RD	15445 SF
4TH	15445 SF
5TH	15445 SF
6TH	15445 SF
7TH	15445 SF
8TH	15352 SF
9TH	15310 SF
PENTHOUSE	1294 SF
	162756 SF

A	**PROJECT NAME: 28 Pearl St.**			
B	**PROJECT ADDRESS:**			
	28 PEARL ST. PORT CHESTER, NY 10573			
C	**PROJECT DESCRIPTION:**			
	NEW CONSTRUCTION OF A 9-STORY MULTIFAMILY BUILDING ABOVE A 3-STORY PRIVATE PARKING GARAGE. GARAGE WILL BE A TRADITIONAL CONCRETE CONSTRUCTION AND RESIDENTIAL LEVELS ARE PROJECTED TO BE METAL FRAME WITH COMPOSITE FLOOR DECK SYSTEM. ENTRANCE TO THE GARAGE, APARTMENT LOBBY/LEASING OFFICE, AND RETAIL SPACE ARE ALL AT 1ST FLOOR LEVEL. IN ADDITION, THE BUILDING HAS AMENITY SPACES FOR THE TENANTS AT THE 2ND LEVEL , 8TH LEVEL AND PENTHOUSE LEVEL. EXTERIOR BUILDING FINISH WILL BE A COMBINATION OF BRICK & METAL PANELS. THE BUILDING WILL BE FULLY SPRINKLED.			
D	**APPLICABLE CODES**			
1	**BUILDING / DWELLING CODE**	2020 BUILDING CODE OF NEW YORK STATE (Adopts the IBC 2018 with amendments)		
2	STRUCTURAL CODE			
3	PLUMBING CODE	2020 PLUMBING CODE OF NEW YORK STATE (Adopts the IPC 2018 with amendments)		
4	MECHANICAL CODE	2020 MECHANICAL CODE OF NEW YORK STATE (Adopts the IMC 2018 with amendments)		
5	ELECTRICAL CODE	2017 ELECTRICAL CODE OF NEW YORK STATE (Adopts NFPA 70, 2017 without amendments)		
6	GAS CODE	2020 FUEL & GAS CODE OF NEW YORK STATE (Adopts the IFGC 2018 with amendments)		
7	FIRE / LIFE SAFETY CODE	2020 FIRE CODE OF NEW YORK STATE (Adopts the IFC 2018 with amendments)		
8	ACCESSIBILITY CODE	ANSI A117.1, 2009		
		FAIR HOUSING ACT DESIGN MANUAL, 1998		
		2010 ADA STANDARDS		
9	ENERGY CODE	2020 ENERGY CONSERVATION CODE OF NEW YORK STATE (Adopts the IECC 2018 with amendments)		
E	**BUILDING INFORMATION**			
1	NUMBER OF UNITS		140 DWELLING UNITS	
2	NUMBER OF STORIES		2 STORIES BELOW AVG. FIN. GRADE + 9 STORIES ABOVE AVG. FIN. GRADE	
3	BUILDING HEIGHT		104'- 0" FROM AVERAGE GRADE TO ROOF	
4	BUILDING AREAS		Refer to Tabulation (sheet G-002)	
5	SPRINKLER SYSTEM		NFPA 13	
6	CONSTRUCTION TYPE (TABLE 601)		I-A (PODIUM) & I-B (RESIDENTIAL)	
F	**USE AND OCUPANCY (CHAPTER 3 & 5)**		**OCCUPANCY USE:**	
1	USE & OCCUPANCY (IBC 310.4 & 311.3)		**S-2 STORAGE (MAIN OCCUPANCY @ PODIUM LEVELS):**	CELLAR 2, CELLAR 1 & 1ST LEVEL
			R-2 RESIDENTIAL GROUP (MAIN OCCUPANCY ABOVE PODIUM):	2ND THRU 9TH RESIDENTIAL FLOORS
	*MIXED USE OCCUPANCY (BUILDING 1) PER SECTION 508.3		**A-3 ASSEMBLY:**	PENTHOUSE FLOOR
	**SPECIAL PROVISIONS PER SECTION 510.2 & 510.4		**B-BUSINESS:**	LEASING OFFICE (1ST FLOOR)
G	**GENERAL BUILDING INFORMATION**			
1	CONSTRUCTION TYPE (TABLE 601)		I-A (PODIUM) & I-B (RESIDENTIAL)	
			ALLOWED	**PROVIDED**
2	BUILDING HEIGHT (TABLE 504.3)		R-2: 180'-0" ABOVE GRADE PLANE	104'- 0" FROM AVERAGE GRADE TO ROOF
			S-2: UNLIMITED	7'- 9 1/2" FROM AVERAGE GRADE TO SECOND FL
3	BUILDING AREA (TABLE 506.2)		R-2: UNLIMITED	**Refer to Area Tabulation Sheets G-011 - G-014; Max Area Provided: 162,780 SF**
			S-2: UNLIMITED	
H	**SPECIAL DETAILED REQUIREMENTS - HIGH-RISE BUILDINGS (IBC SECTION 403)**			
1	HIGH-RISE BUILDING (403.2) REDUCTION IN FIRE RESISTANCE RATING. PER - 403.2.1.1 # 2 HIGH RISE EXCEPTION, FIRE RESISTANCE RATING OF BUILDING ELEMENTS IN TYPE 1B PERMITTED TO BE REDUCED TO FIRE RESISTANCE RATING IN **TYPE IIA**, (RATING REDUCED BY 1 HR)			
2	PER - 403.2.1.1 # 3 THE BUILDING HEIGHT AND BUILDING AREA LIMITATIONS OF A BUILDING CONTAINING BUILDING ELEMENTS WITH REDUCED FIRE-RESISTANCE RATINGS SHALL BE PERMITTED TO BE THE SAME AS THE BUILDING WITHOUT SUCH REDUCTIONS.			
I	**MIXED OCCUPANCY SEPARATION (IBC SECTION 508)**			
1	**NO SEPARATION IS REQUIRED BETWEEN MAIN OCCUPANCY & ACCESSORY OCCUPANCY IF AGGREGATE OCCUPANCIES IS LESS THAN 10% OF FLOOR AREA (IBC 508.2)**		PROVIDE SEPARATE USE BETWEEN USE GROUP ON PARKING LEVEL 1. COMBINED ACCESSORY AREAS IS MORE THAN 10%	
J	**INCIDENTAL USE (IBC SECTION 509)**		**REQUIRED**	**PROPOSED**
1	SEPARATION & PROTECTION (IBC TABLE 509)	TABLE 716.5 OPENING FIRE PROTECTION	WASTE COLLECTION ROOM > 100 = 1-HR FIRE BARRIER	2-HR (RATED PER 713.13.4 CHUTE DISCHARGE RM); 90-MIN DOOR
K	**SEPARATION / PROTECTION (IBC SECTION 420, TABLES 601, 602 & 705.2)**			
	CONSTRUCTION TYPES (IBC TABLE 601)		**CONSTRUCTION TYPE(S) -SEE SECTION H ABOVE**	
			I - A (PODIUM)	**II - A (RESIDENTIAL)**
1	PRIMARY STRUCTURE		3-HR	1-HR
2	BEARING WALLS			
	EXTERIOR		3-HR	1-HR
	INTERIOR		3-HR	1-HR
3	NON-BEARING WALLS & PARTITIONS			
	EXTERIOR		N/A	N/A
	INTERIOR		0-HR	0-HR
4	FLOOR CONSTRUCTION INCL. BEAMS & JOISTS		2-HR	1-HR
5	ROOF CONSTRUCTION INCL. BEAMS & JOISTS		N /A (3HR PODIUM)	1-HR
6	SEPARATION OF OCCUPANCY (TABLE 508.4)	**WHERE ACCESSORY USE IS GREATER THAN 10% (REER TO LINE H, 1 ABOVE)**	S-2 to B or M = 1-HR = 1-HR S-2 to A	
L	**FIRE PARTITIONS (IBC 703)**			
7	R-2 - D.U. (DWELLING UNITS) SEPERATED FROM OTHER D.U. (IBC 708.3)		1-HR, VERT. & HORIZ: 45 MIN DOOR	1-HR FIRE PARTITION, HORIZ. & VERT.; 45-MIN RATED DOORS
8	R-2 - D.U. SEPARATED FROM CONTIGUOUS ACCESSORY OCCUPANCIES (IBC 708.3)		1-HR, VERT. & HORIZ.	1-HR FIRE PARTITION, HORIZ. & VERT.
9	CORRIDOR (TABLE 1020.1)		R-2: 1/2-HR (OCC. LOAD > 10)	EXCEEDS, 1-HR FIRE PARTITION; 45-MIN RATED DOORS
			A: 0-HR (OCC. LOAD > 30)	EXCEEDS, 1-HR FIRE PARTION: 45 MIN RATED DOORS
10	SHAFT ENCLOSURES (IBC 713)		2-HR FIRE BARRIER FOR (4) STORIES OR MORE	2 -HR FIRE BARRIER; 90-MIN DOOR
11	FIRE ENCLOSURE OF EXITS (IBC 713.4, TABLE 716.5 OPENING PROTECTION)		2-HR FIRE BARRIER	2-HR FIRE BARRIER; 90-MIN DOOR
12	STAIR SHAFT & ELEVATOR HOISTWAYS (IBC 1023.2, TABLE 716.5 OPENING PROTECTION)		2-HR FIRE BARRIER	2-HR FIRE BARRIER; 90-MIN DOOR
13	TRASH CHUTE & TRASH/COMPACTOR ROOM (IBC 713.13 & 713.13.4, TABLE 716.5 OPENING PROTECTION)		2-HR FIRE BARRIER	2-HR FIRE BARRIER; 90-MIN DOOR
M	**FIRE PROTECTION SYSTEM (CHAPTER 9)**		**REQUIRED**	**PROVIDED**
1	SPRINKLER SYSTEM (IBC 903)		R - REQUIRED, NO EXCEPTIONS S-2 - REQUIRED WHEN MORE THAN 12,000 SF	NFPA - 13
2	STANDPIPES (IBC 905.3, 905.3.1 EXCEPTION 1)		CLASS 1 REQUIRED WHEN FLOOR LEVEL OF HIGHEST LEVEL IS > 30'	DRY. REFER TO FIRE PROTECTION DRAWINGS
3	PORTABLE FIRE EXTINGUISHER (IBC 906)		MAX. FLOOR AREA FOR FE = 11,250 SF; MAX. TRAVEL DIST FOR FE = 75'-0"	COMPLY, REFER TO LIFE SAFETY PLANS G-011 thru G-014
N	**MEANS OF EGRESS (CHAPTER 10)**		**REQUIRED**	
1	EXIT ACCESS DOORWAYS (IBC SECTION 1007.1.1)		1/3 MIN OF THE DIAGONAL DISTANCE PER NFPA	1/3 MIN OF THE DIAGONAL DISTANCE PER NFPA
2	LENGTH OF EXIT ACCESS TRAVEL DISTANCE (IBC TABLE 1017.2)		400 FEET	REFER TO SHEETS G-011 - G-014
3	DEAD END CORRIDOR (IBC SECTION 1020.4)		50 FEET	17'-1 1/2" FEET
4	CORRIDOR WIDTH (IBC SECTION 1005.1 & 1020.2)		44 INCHES MINIMUM	44 INCHES MINIMUM
5	EXIT PASSAGEWAYS (IBC 1024)		44 INCHES MIN. WIDE (36 INCHES IF OCCUPANT LOAD IS LESS THAN 36)	
6	DOORS, STAIRS, & GUARDRAIL REQUIREMENTS			
	EGRESS DOORS (IBC SECTION 1005.1 & 1010.1)		WIDTH = OCCUPANT LOAD X 0.15 INCHES; 36 INCHES MIN.	
	EGRESS DOOR SWING IN DIRECTION OF TRAVEL (IBC 1010.2.1)		IN DIRECTION OF TRAVEL. EXCEPTION WHEN AREA/ROOM WHERE EGRESS DOOR SERVES IS LESS THAN 50 PERSONS	
	STAIRS WIDTH (IBC SECTION 1005.3.1 & 1011.2)		WIDTH = OCCUPANT LOAD X 0.2 INCHES; 44 INCHES MIN.	
	HEADROOM (IBC Section 1011.3)		80 INCHES MINIMUM	
	GUARDRAIL HEIGHT (IBC SECTION 1015.3)		42 INCHES MINUMUM	
	OPENING LIMITATIONS BETWEEN VERTICAL BALUSTERS (IBC SECTION 1015.4)		LESS THAN 4" INCHES	
	STAIR TREADS (NFPA 101 7.2.2.2)		11 IN MINIMUM	
	STAIR RISER HEIGHT (IBC SECTION 1015.3)		7 IN MAX / 4 IN MIN	
7	HANDRAIL HEIGHT (IBC SECTION 1015.3)			
	HEIGHT (IBC 1014.2)		34 IN. MIN AND 38 IN. MAX	
	GRIP SIZE - CIRCULAR (IBC 1014.3))		CIRCULAR: 1 1/2" IN. MIN., 2 1/4" IN. MAX. NON-CIRCULAR: 4 IN. MIN, 6-1/4 IN. MAX., CROSS SECTION DIM OF 2-1/4 IN MAX.	
	CONTINUITY (IBC 1014.4, AND 1014.6)		HANDRAILS TO BE CONTINUOUS. WHEN NOT CONTINUOUS (IBC SECTION 1014.6), EXTEND 12 IN. HORIZONTAL BEYOND TOP RISER AND CONTINUE TO SLOPE RISER FOR DEPTH OF ONE TREAD BEYOND THE BOTTOM RISER.	
O	**ACCESSIBILITY (CHAPTER 11)**			
1	ALL DWELLING UNITS AND COMMON AREAS SHALL COMPLY WITH ICC A117.1, TYPE A & B UNITS (1107.6.2.2)		DWELLING UNITS SHALL MEET TYPE B WHEN THERE ARE 4 OR MORE DWELLING UNITS (D.U.)	
	UNIT ENTRY DOOR (ANSI SECTION 1003.2)		PROVIDE CLEAR WIDTH & MANEUVERING CLEARANCES AT PRIMARY ENTRANCE INTO UNIT	
	DOORS WITHIN UNITS (ANSI SECTION 1003.3)		PROVIDE CLEAR WIDTH & MANEUVERING CLEARANCES AT PASSAGE DOORS (EXCEPTION TO HALF BATH)	
	TOILET & BATHING FACILITIES (ANSI SECTION 1003.11)		PROVIDE MIN. (1) TYPE A TOILET & BATHING FACILITY IN D.U.	

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OWNER:

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

CODE ANALYSIS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:44:50 AM
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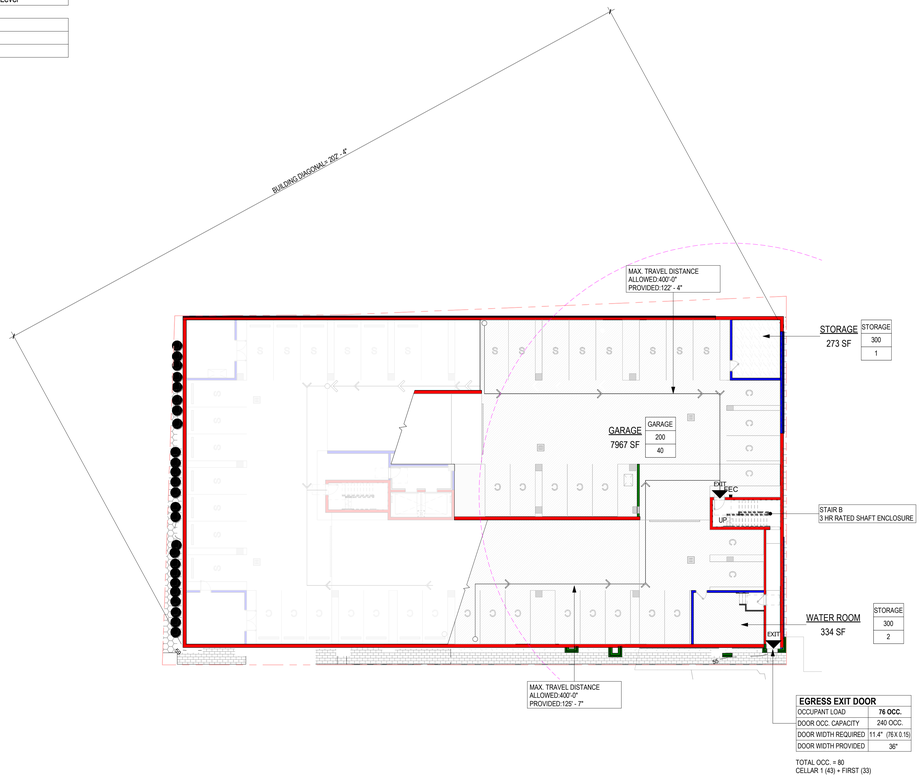
G-003

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AREA SCHEDULE (CELLAR 1)

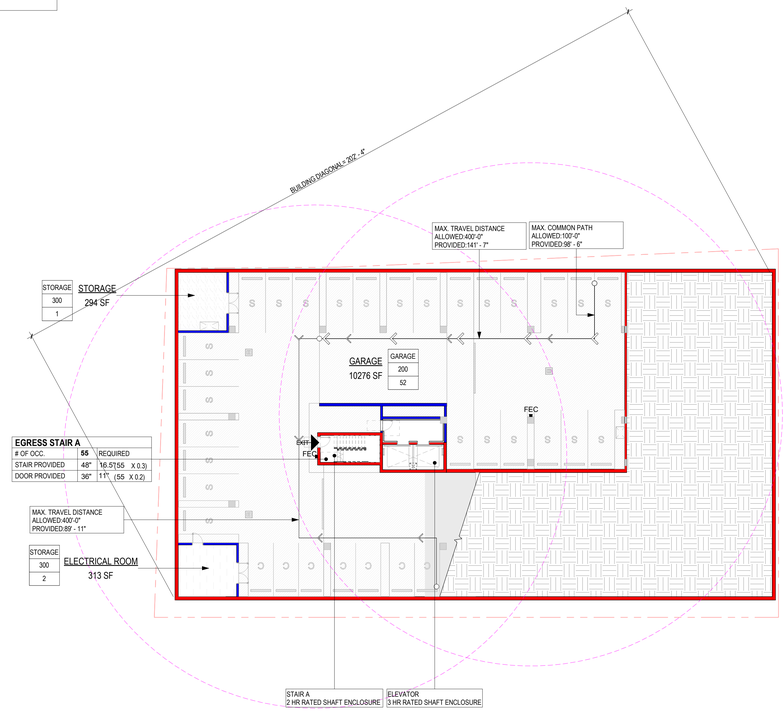
AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
GARAGE	7967 SF	STORAGE	200	40	CELLAR 1
STORAGE	273 SF	STORAGE	300	1	CELLAR 1
WATER ROOM	334 SF	STORAGE	300	2	CELLAR 1
TOTAL				43	



2 G-011 CELLAR 1
Scale: 1/16" = 1'-0"

AREA SCHEDULE (CELLAR 2)

AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
ELECTRICAL ROOM	313 SF	STORAGE	300	2	CELLAR 2
GARAGE	10276 SF	STORAGE	200	52	CELLAR 2
STORAGE	294 SF	STORAGE	300	1	CELLAR 2
TOTAL				55	



1 G-011 CELLAR 2
Scale: 1/16" = 1'-0"

GENERAL NOTES

1. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL RESIDENTIAL UNITS, UON.
2. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL CORRIDORS IN RESIDENTIAL AREAS, UON.
3. ALL SHAFT ENCLOSURES; INCLUDING STAIRS, ELEVATORS AND MECHANICAL SHAFTS TO BE 2 HOUR RATED, UON.
4. PROVIDE 2 HOUR HORIZONTAL ENCLOSURE AT ALL HORIZONTAL TRANSFERS OF DUCTS IN RATED SHAFTS.
5. REFER TO G-002 FOR MINIMUM RATING REQUIREMENTS OF ASSEMBLIES.
6. RESIDENTIAL LEVEL FIRE EXTINGUISHERS TO BE PLACED SUCH THAT ANY PORTIONS OF THE PUBLIC CORRIDOR IS NO MORE THEN 75' TRAVEL DISTANCE TO THE EXTINGUISHER.
7. FIRE EXTINGUISHER CABINETS ON ALL FLOORS ARE TO BE SEMI-RECESSED. IF ON A RATED PARTITION, GYPSUM BOARD MUCH WRAP BEHIND THE RECESS CABINET TO MAINTAIN THE RATING. REVIEW WITH BUILDING INSPECTOR PRIOR TO FRAMING.
8. FIRE EXTINGUISHERS TO A MINIMUM OF 10 LBS.

SIGNAGE NOTES :

1. LETTERS AND NUMBER OF SIGNS SHALL BE OF UPPER CASE FOTTLIGHT MT TYPE AND SHALL BE ENGRAVED 1/32".
2. LETTERS AND NUMBERS SHALL BE AT LEAST 5/8" IN HEIGHT BUT NO GREATER THAN 2".
3. PICTOGRAMS SHALL BE ACCOMPAINTED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM
   THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE 6" MIN. IN HEIGHT.
4. GRADE 2 LITERARY BRAILLE SHALL BE ACCOMPANIED BY LETTERING.
   THE STANDARD DIMENSIONS ARE AS FOLLOWS.
   DOT DIAMETER 0.059 IN.
   INTER-DOT SPACING 0.090 IN.
   HORIZONTAL SEPARATION BETWEEN CELL 0.241 IN.
   VERTICAL SEPARATION BETWEEN CELLS 0.395 IN.
5. CHARACTER OF SIGNS SHALL BE ASI MODULEX INCAST SYSTEM. COLOR AND FINISH TBD. ANTHONY STAUB 410.783.2741
6. SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. CONCEALED MOUNTING. WHERE ADEQUATE WALL SPACE FOR MOUNTING IS UNAVAILABLE. SIGNAGE SHALL BE LOCATED AT ADJACENT RETURN WALL ACCORDING TO ADA REGULATIONS.
7. MOUNTING HEIGHT SHALL BE 60" ABOVE THE FINISH FLOOR TO THE CENTERLINE OF THE SIGN.
8. MOUNTING LOCATION SHALL BE SO THAT A PERSON MAY APPROACH WITH IN 3" OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF THE DOOR.
9. REFERENCES; AMERICAN WITH DISABILITES ACT, ACCESSIBILITY GUIDELINES SECTION 4.30 SIGNAGE.
10. ROOM NAMES AND NUMBERS ARE FOR BIDDING PURPOSE ONLY TO BE CONFIRMED BY OWNER.
11. PROVIDE SHOP DRAWINGS FOR APPROVAL INCLUDING SIGN TYPES, MOUNTING, VERBAGE AND LOCATION.
12. PROVIDE SIGNS AT ALL LEVELS.

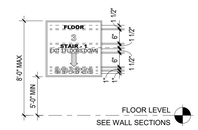
EXAMPLE OF TYPE OF SIGNS:

ROOM NAME	VERBAGE	TYPE OF SIGN
ELECTRICAL SWITCHGEAR	ELEC. SWITCH	C
ELEVATOR LOBBY	ELEV. LOBBY	C
PUMP ROOM	PUMP ROOM	C
STORAGE	STORAGE	C
STAIR SIGNAGE IN THE CORRIDOR	STAIR	A
RESTROOM	UNISEX RESTROOM	B
TRASH CHUTE	TRASH CHUTE	C
TRASH ROOM	TRASH ROOM	C
ELECTRICAL ROOM	ELEC. RM	C
TELEPHONE ROOM	IT / TEL. RM.	C
FITNESS CENTER	FITNESS CENTER	C
CLUB ROOM	CLUB ROOM	C
BUSINESS CENTER	BUSINESS CENTER	C
UNIT ENTRY	(UNIT#, SEE PLANS)	D
OFFICE	LEASING OFFICE	C
WORK ROOM	WORK ROOM	C
MAIL ROOM	MAIL ROOM	C

LEGEND

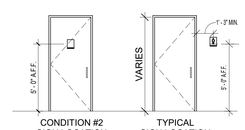
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL
- TRAVEL DISTANCE
- DIAGONAL DISTANCE
- FEC — FIRE EXTINGUISHER CABINET (WHERE CABINETS CANNOT BE SEMI-RECESSED, MOUNT LEADING EDGE OF CABINET AT 20" AFF)
- R 15'-0" — FIRE EXTINGUISHER TRAVEL DISTANCE

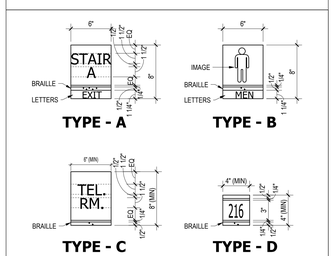
STAIR IDENTIFICATION @ EXIT ENCLOSURE:



NOTE :
1. ALL STAIR SIGNAGE TO COMPLY WITH BUILDING CODES
2. THE SIGN SHALL BE LOCATED ENTIRELY WITHIN THE AREA IN A POSITION WHICH IS REALLY VISIBLE WHEN THE STAIRWAY DOORS ARE IN THE OPEN AND/OR CLOSED POSITION.

CORRIDOR SIGNAGE:





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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

LIFESAFETY PLAN - CELLAR 2 / CELLAR 1

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

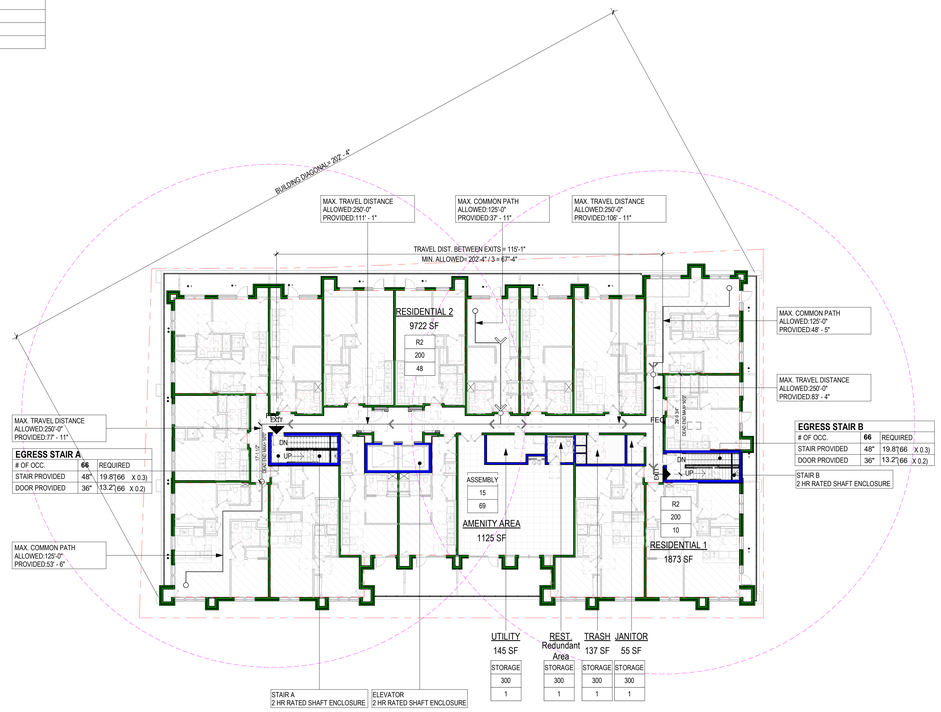
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AREA SCHEDULE (R1)

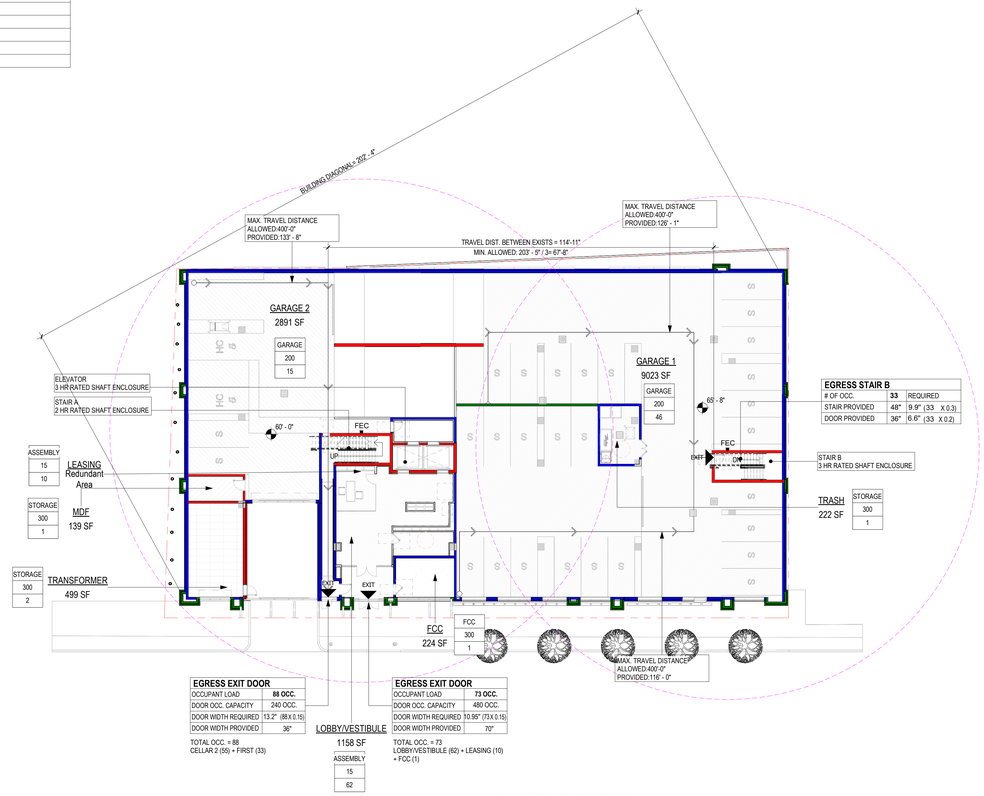
AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
AMENITY AREA	1027 SF	ASSEMBLY	15	69	2ND FLOOR
JANITOR	55 SF	STORAGE	300	1	2ND FLOOR
RESIDENTIAL 1	1873 SF	RESIDENTIAL	200	10	2ND FLOOR
RESIDENTIAL 2	9503 SF	RESIDENTIAL	200	48	2ND FLOOR
REST.	75 SF	STORAGE	300	1	2ND FLOOR
TRASH	137 SF	STORAGE	300	1	2ND FLOOR
UTILITY	159 SF	STORAGE	300	1	2ND FLOOR
TOTAL				131	



2 2ND FLOOR
G-012 Scale: 1/16" = 1'-0"

AREA SCHEDULE (FIRST FLOOR)

AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
FCC	224 SF	STORAGE	300	1	1ST FLOOR
GARAGE 1	9103 SF	STORAGE	200	46	1ST FLOOR
GARAGE 2	2891 SF	STORAGE	200	15	1ST FLOOR
LEASING	147 SF	ASSEMBLY	15	10	1ST FLOOR
LOBBY/VESTIBULE	923 SF	ASSEMBLY	15	62	1ST FLOOR
MDF	139 SF	STORAGE	300	1	1ST FLOOR
TRANSFORMER	499 SF	STORAGE	300	2	1ST FLOOR
TRASH	222 SF	STORAGE	300	1	1ST FLOOR
TOTAL				138	



1 1ST FLOOR PLAN
G-012 Scale: 1/16" = 1'-0"

GENERAL NOTES

1. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL RESIDENTIAL UNITS, UON.
2. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL CORRIDORS IN RESIDENTIAL AREAS, UON.
3. ALL SHAFT ENCLOSURES; INCLUDING STAIRS, ELEVATORS AND MECHANICAL SHAFTS TO BE 2 HOUR RATED, UON.
4. PROVIDE 2 HOUR HORIZONTAL ENCLOSURE AT ALL HORIZONTAL TRANSFERS OF DUCTS IN RATED SHAFTS.
5. REFER TO G-002 FOR MINIMUM RATING REQUIREMENTS OF ASSEMBLIES.
6. RESIDENTIAL LEVEL FIRE EXTINGUISHERS TO BE PLACED SUCH THAT ANY PORTIONS OF THE PUBLIC CORRIDOR IS NO MORE THEN 75' TRAVEL DISTANCE TO THE EXTINGUISHER.
7. FIRE EXTINGUISHER CABINETS ON ALL FLOORS ARE TO BE SEMI-RECESSED. IF ON A RATED PARTITION, GYPSUM BOARD MUCH WRAP BEHIND THE RECESS CABINET TO MAINTAIN THE RATING. REVIEW WITH BUILDING INSPECTOR PRIOR TO FRAMING.
8. FIRE EXTINGUISHERS TO A MINIMUM OF 10 LBS.

SIGNAGE NOTES :

1. LETTERS AND NUMBER OF SIGNS SHALL BE OF UPPER CASE FOTTLIGHT MT TYPE AND SHALL BE ENGRAVED 1/32".
2. LETTERS AND NUMBERS SHALL BE AT LEAST 5/8" IN HEIGHT BUT NO GREATER THAN 2".
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4. GRADE 2 LITERARY BRAILLE SHALL BE ACCOMPANIED BY LETTERING.
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   HORIZONTAL SEPARATION BETWEEN CELL 0.241 IN.
   VERTICAL SEPARATION BETWEEN CELLS 0.395 IN.
5. CHARACTER OF SIGNS SHALL BE ASI MODULEX INCAST SYSTEM. COLOR AND FINISH TBD. ANTHONY STAUB 410.783.2741
6. SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. CONCEALED MOUNTING. WHERE ADEQUATE WALL SPACE FOR MOUNTING IS UNAVAILABLE. SIGNAGE SHALL BE LOCATED AT ADJACENT RETURN WALL ACCORDING TO ADA REGULATIONS.
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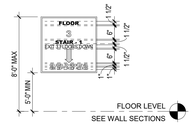
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STORAGE	STORAGE	C
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TRASH CHUTE	TRASH CHUTE	C
TRASH ROOM	TRASH ROOM	C
ELECTRICAL ROOM	ELEC. RM	C
TELEPHONE ROOM	IT / TEL. RM.	C
FITNESS CENTER	FITNESS CENTER	C
CLUB ROOM	CLUB ROOM	C
BUSINESS CENTER	BUSINESS CENTER	C
UNIT ENTRY	(UNIT#, SEE PLANS)	D
OFFICE	LEASING OFFICE	C
WORK ROOM	WORK ROOM	C
MAIL ROOM	MAIL ROOM	C

LEGEND

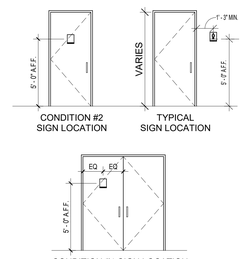
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL
- TRAVEL DISTANCE
- DIAGONAL DISTANCE
- FEC — FIRE EXTINGUISHER CABINET (WHERE CABINETS CANNOT BE SEMI-RECESSED, MOUNT LEADING EDGE OF CABINET AT 20" AFF)
- R:15'-0" — FIRE EXTINGUISHER TRAVEL DISTANCE

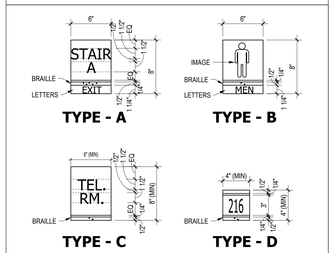
STAIR IDENTIFICATION @ EXIT ENCLOSURE:



NOTE :
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CORRIDOR SIGNAGE:





ARCHITECT:

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OWNER:

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

LIFESAFETY PLAN - 1ST FLOOR / 2ND FLOOR

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 2:18:54 PM
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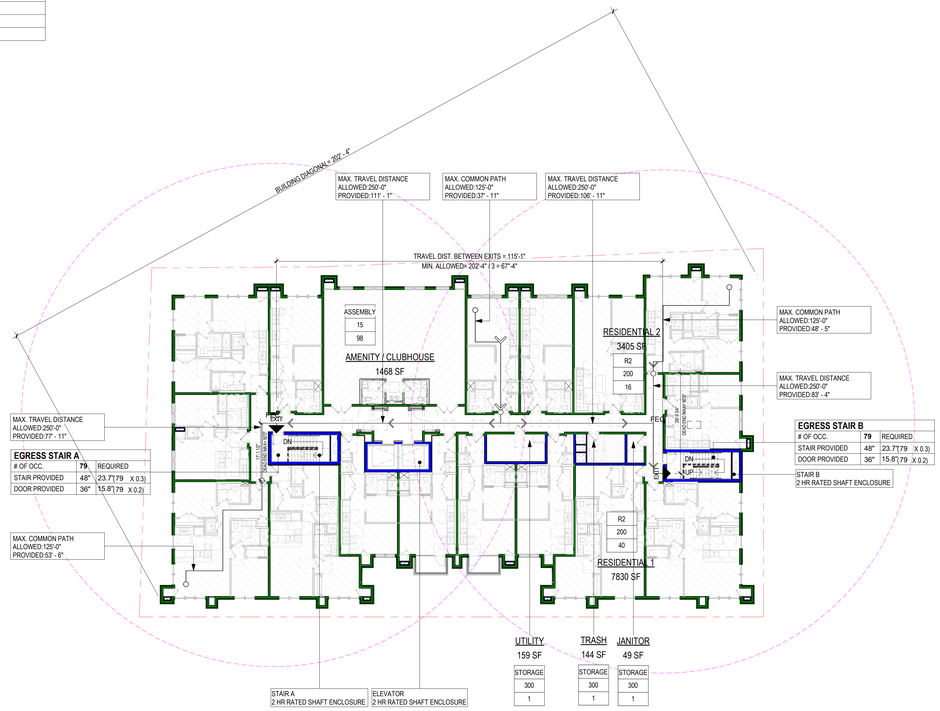
G-012

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AREA SCHEDULE (R8)

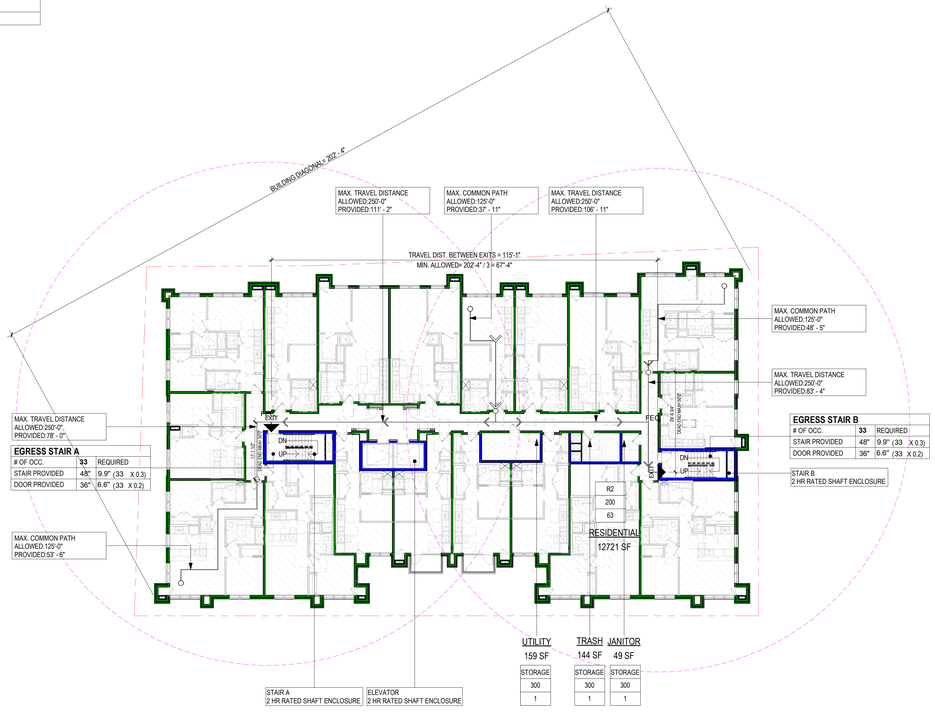
AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
AMENITY / CLUBHOUSE	1468 SF	ASSEMBLY	15	98	9TH FLOOR
JANITOR	49 SF	STORAGE	300	1	9TH FLOOR
RESIDENTIAL 1	7830 SF	RESIDENTIAL	200	40	9TH FLOOR
RESIDENTIAL 2	3405 SF	RESIDENTIAL	200	18	9TH FLOOR
TRASH	144 SF	STORAGE	300	1	9TH FLOOR
UTILITY	159 SF	STORAGE	300	1	9TH FLOOR
TOTAL				159	



2 G-013 **9TH FLOOR**
Scale: 1/16" = 1'-0"

AREA SCHEDULE (R2 - R7_TYPICAL FLOOR)

AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
JANITOR	49 SF	STORAGE	300	1	3RD FLOOR
RESIDENTIAL	12721 SF	RESIDENTIAL	200	64	3RD FLOOR
TRASH	144 SF	STORAGE	300	1	3RD FLOOR
UTILITY	159 SF	STORAGE	300	1	3RD FLOOR
TOTAL				67	



1 G-013 **(3RD - 8TH) TYPICAL FLOOR**
Scale: 1/16" = 1'-0"

GENERAL NOTES

1. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL RESIDENTIAL UNITS, UON.
2. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL CORRIDORS IN RESIDENTIAL AREAS, UON.
3. ALL SHAFT ENCLOSURES; INCLUDING STAIRS, ELEVATORS AND MECHANICAL SHAFTS TO BE 2 HOUR RATED, UON.
4. PROVIDE 2 HOUR HORIZONTAL ENCLOSURE AT ALL HORIZONTAL TRANSFERS OF DUCTS IN RATED SHAFTS.
5. REFER TO G-002 FOR MINIMUM RATING REQUIREMENTS OF ASSEMBLIES.
6. RESIDENTIAL LEVEL FIRE EXTINGUISHERS TO BE PLACED SUCH THAT ANY PORTIONS OF THE PUBLIC CORRIDOR IS NO MORE THEN 75' TRAVEL DISTANCE TO THE EXTINGUISHER.
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8. FIRE EXTINGUISHERS TO A MINIMUM OF 10 LBS.

SIGNAGE NOTES :

1. LETTERS AND NUMBER OF SIGNS SHALL BE OF UPPER CASE FOTTLIGHT MT TYPE AND SHALL BE ENGRAVED 1/32".
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   THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE 6" MIN. IN HEIGHT.
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   THE STANDARD DIMENSIONS ARE AS FOLLOWS.
   DOT DIAMETER 0.059 IN.
   INTER-DOT SPACING 0.090 IN.
   HORIZONTAL SEPARATION BETWEEN CELL 0.241 IN.
   VERTICAL SEPARATION BETWEEN CELLS 0.395 IN.
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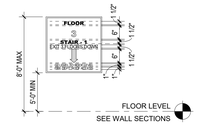
EXAMPLE OF TYPE OF SIGNS:

ROOM NAME	VERBAGE	TYPE OF SIGN
ELECTRICAL SWITCHGEAR	ELEC. SWITCH	C
ELEVATOR LOBBY	ELEV. LOBBY	C
PUMP ROOM	PUMP ROOM	C
STORAGE	STORAGE	C
STAIR SIGNAGE IN THE CORRIDOR	STAIR	A
RESTROOM	UNISEX RESTROOM	B
TRASH CHUTE	TRASH CHUTE	C
TRASH ROOM	TRASH ROOM	C
ELECTRICAL ROOM	ELEC. RM	C
TELEPHONE ROOM	IT / TEL. RM.	C
FITNESS CENTER	FITNESS CENTER	C
CLUB ROOM	CLUB ROOM	C
BUSINESS CENTER	BUSINESS CENTER	C
UNIT ENTRY	(UNIT#, SEE PLANS)	D
OFFICE	LEASING OFFICE	C
WORK ROOM	WORK ROOM	C
MAIL ROOM	MAIL ROOM	C

LEGEND

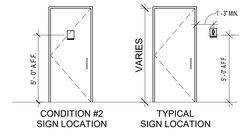
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL
- TRAVEL DISTANCE
- DIAGONAL DISTANCE
- FEC — FIRE EXTINGUISHER CABINET (WHERE CABINETS CANNOT BE SEMI-RECESSED, MOUNT LEADING EDGE OF CABINET AT 26" AFF)
- R.15'-0" — FIRE EXTINGUISHER TRAVEL DISTANCE

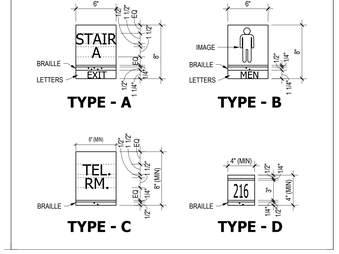
STAIR IDENTIFICATION @ EXIT ENCLOSURE:



NOTE :
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2. THE SIGN SHALL BE LOCATED ENTIRELY WITHIN THE AREA IN A POSITION WHICH IS REALLY VISIBLE WHEN THE STAIRWAY DOORS ARE IN THE OPEN AND/OR CLOSED POSITION.

CORRIDOR SIGNAGE:





ARCHITECT:

lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

SEAL & SIGNATURE:

OWNER:

28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

LIFESAFETY PLAN - (3RD - 8TH) TYPICAL FLOOR / 9TH FLOOR

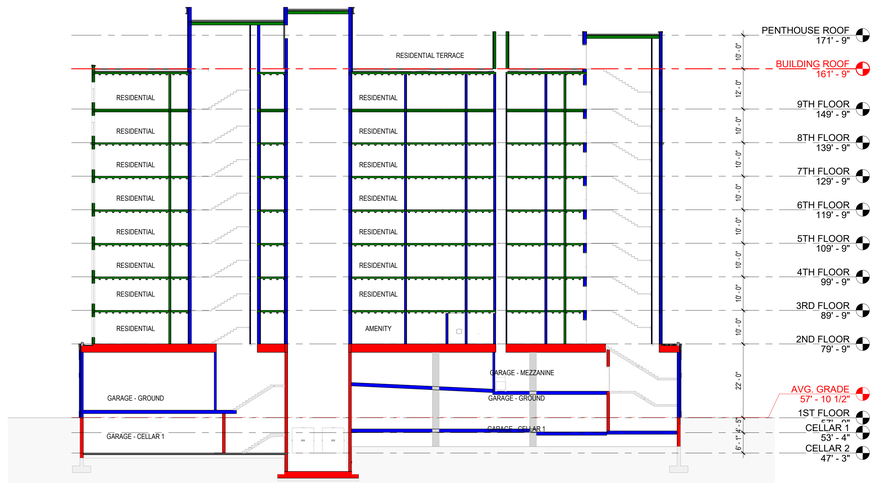
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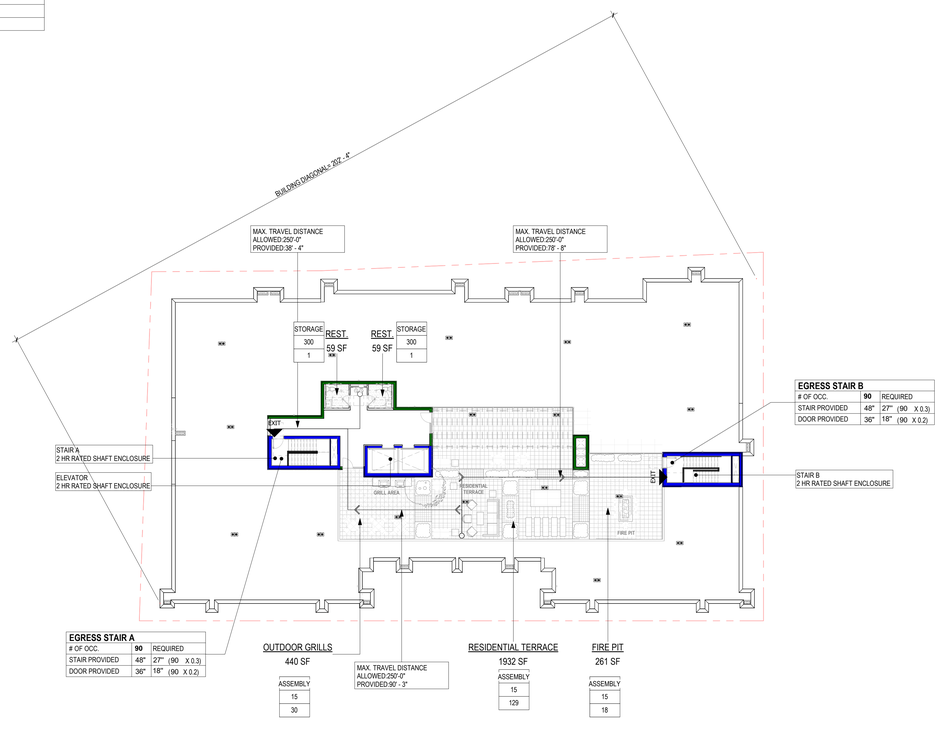
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2 G-014 LIFESAFETY - BUILDING SECTION
Scale: 1/16" = 1'-0"

AREA SCHEDULE (BUILDING ROOF)

AREA NAME	AREA	OCC. TYPE	S.F. PER PERSON	OCC. LOAD	Level
FIRE PIT	261 SF	ASSEMBLY	15	18	BUILDING ROOF
OUTDOOR GRILLS	440 SF	ASSEMBLY	15	30	BUILDING ROOF
RESIDENTIAL TERRACE	1932 SF	ASSEMBLY	15	129	BUILDING ROOF
REST.	59 SF	STORAGE	300	2	BUILDING ROOF
TOTAL				179	



1 G-014 BUILDING ROOF
Scale: 1/16" = 1'-0"

GENERAL NOTES

1. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL RESIDENTIAL UNITS, UON.
2. PROVIDE 2 HOUR FIRE SEPARATION BETWEEN ALL CORRIDORS IN RESIDENTIAL AREAS, UON.
3. ALL SHAFT ENCLOSURES; INCLUDING STAIRS, ELEVATORS AND MECHANICAL SHAFTS TO BE 2 HOUR RATED, UON.
4. PROVIDE 2 HOUR HORIZONTAL ENCLOSURE AT ALL HORIZONTAL TRANSFERS OF DUCTS IN RATED SHAFTS.
5. REFER TO G-002 FOR MINIMUM RATING REQUIREMENTS OF ASSEMBLIES.
6. RESIDENTIAL LEVEL FIRE EXTINGUISHERS TO BE PLACED SUCH THAT ANY PORTIONS OF THE PUBLIC CORRIDOR IS NO MORE THEN 75' TRAVEL DISTANCE TO THE EXTINGUISHER.
7. FIRE EXTINGUISHER CABINETS ON ALL FLOORS ARE TO BE SEMI-RECESSED. IF ON A RATED PARTITION, GYPSUM BOARD MUCH WRAP BEHIND THE RECESS CABINET TO MAINTAIN THE RATING. REVIEW WITH BUILDING INSPECTOR PRIOR TO FRAMING.
8. FIRE EXTINGUISHERS TO A MINIMUM OF 10 LBS.

SIGNAGE NOTES :

1. LETTERS AND NUMBER OF SIGNS SHALL BE OF UPPER CASE FOTTLIGHT MT TYPE AND SHALL BE ENGRAVED 1/32".
2. LETTERS AND NUMBERS SHALL BE AT LEAST 5/8" IN HEIGHT BUT NO GREATER THAN 2".
3. PICTOGRAMS SHALL BE ACCOMPAINTED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM
   THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE 6" MIN. IN HEIGHT.
4. GRADE 2 LITERARY BRAILLE SHALL BE ACCOMPANIED BY LETTERING.
   THE STANDARD DIMENSIONS ARE AS FOLLOWS.
   DOT DIAMETER 0.059 IN.
   INTER DOT SPACING 0.090 IN.
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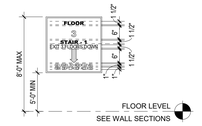
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WORK ROOM	WORK ROOM	C
MAIL ROOM	MAIL ROOM	C

LEGEND

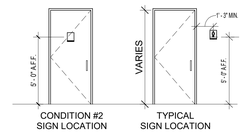
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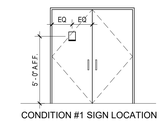
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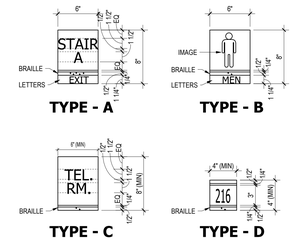


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PORT CHESTER, NY

LIFESAFETY PLAN - PENTHOUSE FLOOR / SECTION

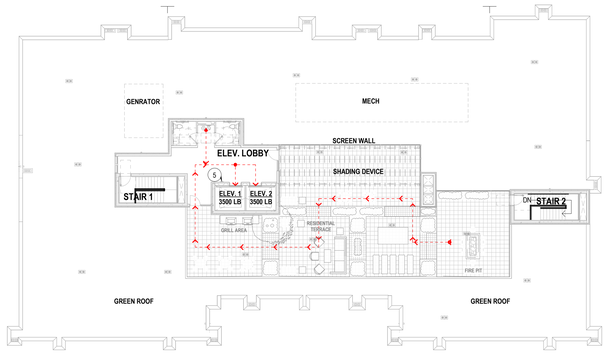
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G-014

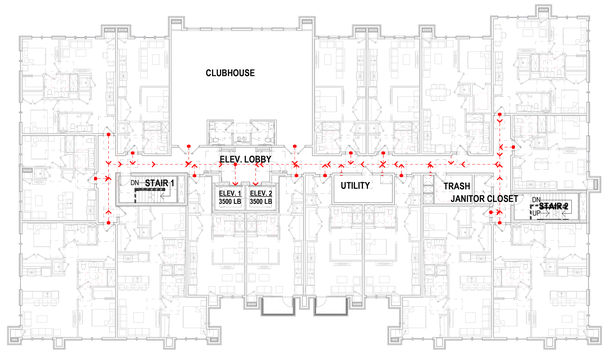
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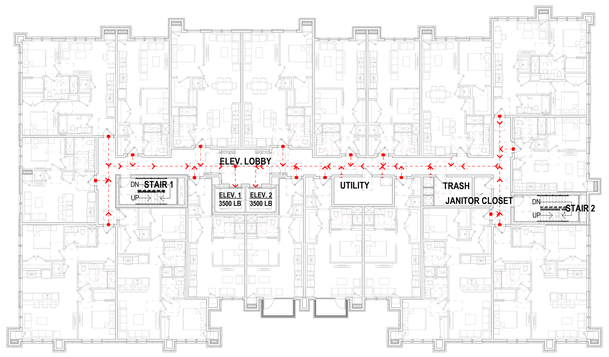
8 G-015 BUILDING ROOF FLOOR PLAN

Scale: 1/16" = 1'-0"



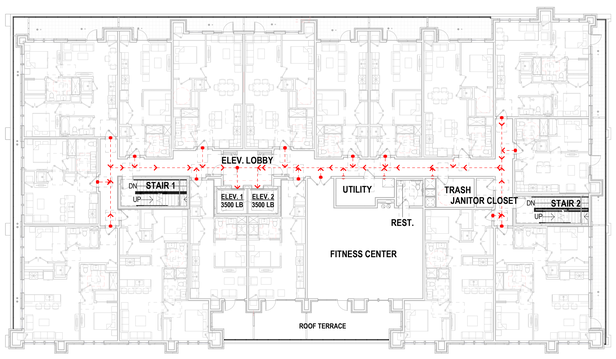
7 G-015 9TH FLOOR PLAN

Scale: 1/16" = 1'-0"



6 G-015 TYPICAL (3RD-8TH) FLOOR PLAN

Scale: 1/16" = 1'-0"



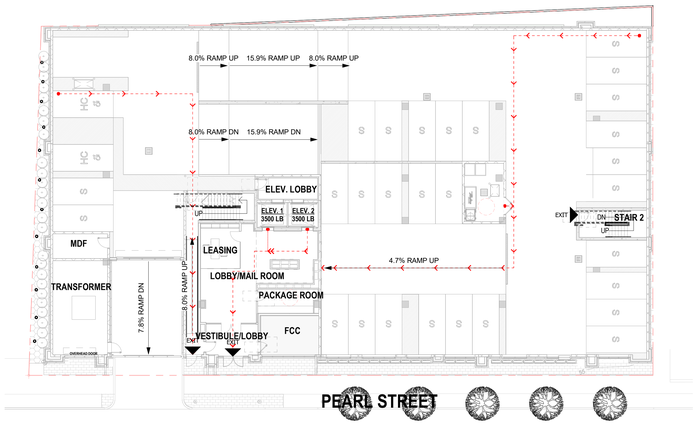
5 G-015 2ND FLOOR PLAN

Scale: 1/16" = 1'-0"



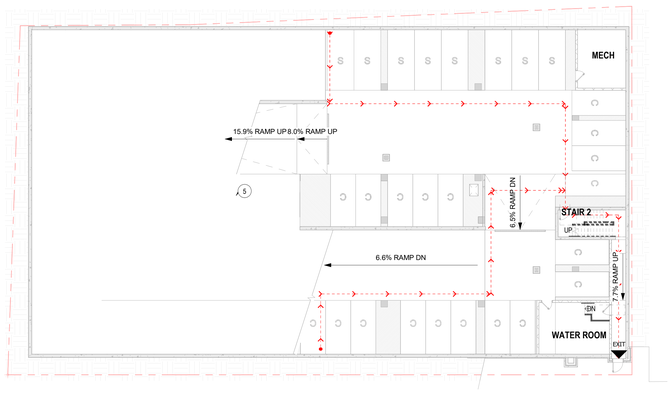
4 G-015 ELEV. LOBBY @ 68'-3"

Scale: 1/16" = 1'-0"



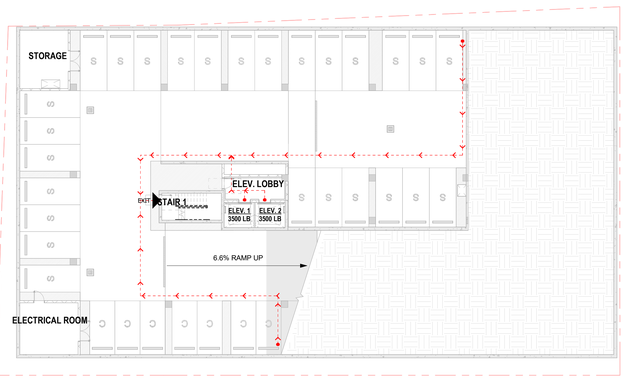
3 G-015 FIRST FLOOR PLAN

Scale: 1/16" = 1'-0"



2 G-015 CELLAR 1 FLOOR PLAN

Scale: 1/16" = 1'-0"



1 G-015 CELLAR 2 FLOOR PLAN

Scale: 1/16" = 1'-0"

SITE ACCESSIBILITY PLAN NOTES:

ICC/ADA Notes:
1. At least one accessible route shall be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zone if provided, and public streets or sidewalks to an accessible building entrance.
2. At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.
3. In public areas, at least 50% of all public entrances must be accessible.
4. Individual tenants must each have an accessible entrance.
5. To be a covered unit, all finished living space must be on the same floor, that is, be a single-story unit, such as single-story townhouses, villas, or patio apartments.

Fair Housing Act (FHA) Notes:

1.All covered ground floor units on an accessible route must be compliant with FHA requirements.
2.Not used.
3.All public & common use areas, inside or outside of a building, shall be on an accessible route.
4.A portion or all of the public trail system must be accessible unless impractical due to extremes of terrain.
5.All buildings must have at least one accessible entrance on an accessible route unless prohibited by extreme terrain or unusual site characteristics.
6.Covered multi-family dwellings are defined as:
- All dwelling units in buildings containing four or more dwelling units, if such buildings have one or more elevators, and
- All ground floor dwelling units in other buildings containing four or more units.

SITE LEGEND

Accessible route

1.36" minimum clear access AISLE with 5'-0" clear PASSING space at intervals not exceeding 200'-0"
2.No running slopes to be greater THAN 5% with any cross slope greater than 2%.
3.Change in level up to 1/4" may be vertical without edge treatment. changes in level between 1/4" and 1/2" shall be beveled with a slope no greater than 1:2.
4.Provide a non-skid surface.
5.Protruding objects with their leading edges between 27" and 80" above the finished floor shall protrude no more than 4" into walks, halls, corridors, passageways or aisles.

Accessible doors

1.Doorways shall have a minimum clear opening of 32" with the door open 90 degrees, measured between the face of the door and the opposite stop.
2.Double leaf doors, at least one leaf shall comply with the rule above.
3.Thresholds in doors shall not exceed 1/2" with a beveled slope no greater than 1:2.
4.Door opening force shall be no more than 5 lbs.
5.Provide lever operating mechanisms, push type mechanisms, or U shaped handles for door hardware. mount hardware no higher than 48" above finished floor.
6.Door closers, if equipped then the sweep period shall be set from an open position at 70 degrees, to take 3 seconds to move to a point 3" from the latch, measured to the leading edge of the door.
7.Provide maneuvering clearance at doors min. 18" pull side of door x 60" deep and 12" push side of door x 60" clear.

Accessible stairs

1.Provide uniform treads @ 11" min. measured from riser to riser. open risers not permitted.
2.Provide uniform risers not to exceed 7".
3.At first floor provide cane detection rail at a height of 27" above finished floor at a distance back and under stair to achieve 6'-8" head height with rise of stair.
4.Nosings - the underside of a nosing SHALL not be abrupt. the radius of the curvature of the leading edge of the tread shall be not greater than 1/2". risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal. nosings shall project no more than 1-1/2".

Accessible elevators

1.Accessible elevators shall be on an accessible route and comply with the ASME A17.1-1990, safety code for elevators and escalators.
2.Call buttons to be centered at 42" above finish floor.
3.Minimum dimensions of elevator cab for non-centered door is 51" x 68" min. and CLEARANCE between the car platform sill AND the edge of any HOISTWAY landing shall be no greater than 1-1/4".

Accessible parking

1.Accessible parking stalls to be 96" wide minimum with a 60" min. wide access aisle. van accessible parking to have a 96" loading unloading zone. vertical clearance to be 114" clear.
2.No slopes in accessible parking spaces and loading zones to be more than 1.5%.
3.Accessible parking stalls to be located on the shortest accessible rout to adjoining building.
4.Each accessible parking space shall be designated with a vertically mounted sign, bottom of edge of accessible parking signage is mounted 60" minimum above finished floor.

Typical notes:

1.Operate HANDLE MUST be of a TYPE that is easy to grab and not require any TWISTING motion.
2.Accessible ramp at 5% slope max. and no cross slope exceeding 2% with a rise of 1'-0".
3.ADA accessible ramp WITH max. slope 8.33% (1:12) and handrails both sides with 12" extensions either end. max. length of any run is 30' with 5' long landing at end of each run.

SITE LEGEND

	PROPERTY LINE
	ACCESSIBLE ROUTE
	ACCESSIBLE MEANS OF EGRESS
ADA	ACCESSIBLE BUILDING ENTRANCE
	PUBLIC AREAS REQUIRED 36" CLEAR AISLE SPACE FOR MANEUVERING

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ACCESSIBLE ROUTE DIAGRAM

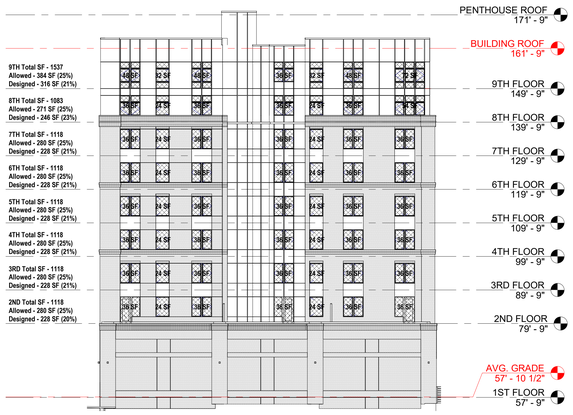
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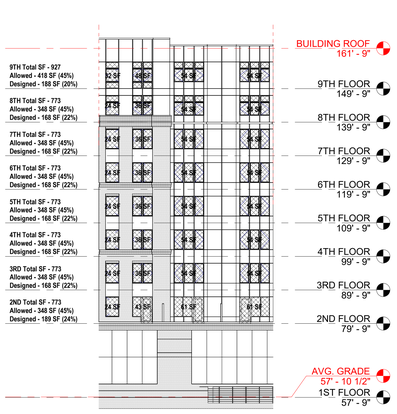
G-015

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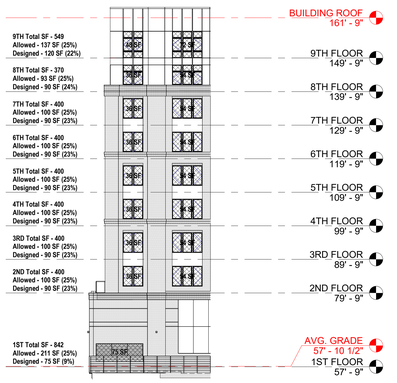
A
FSD = 8' 7"
25% EXTERIOR WALL OPENINGS ALLOWED



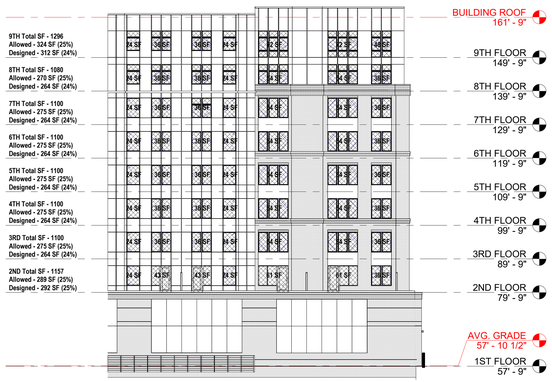
D
FSD = 11' 2"
45% EXTERIOR WALL OPENINGS ALLOWED



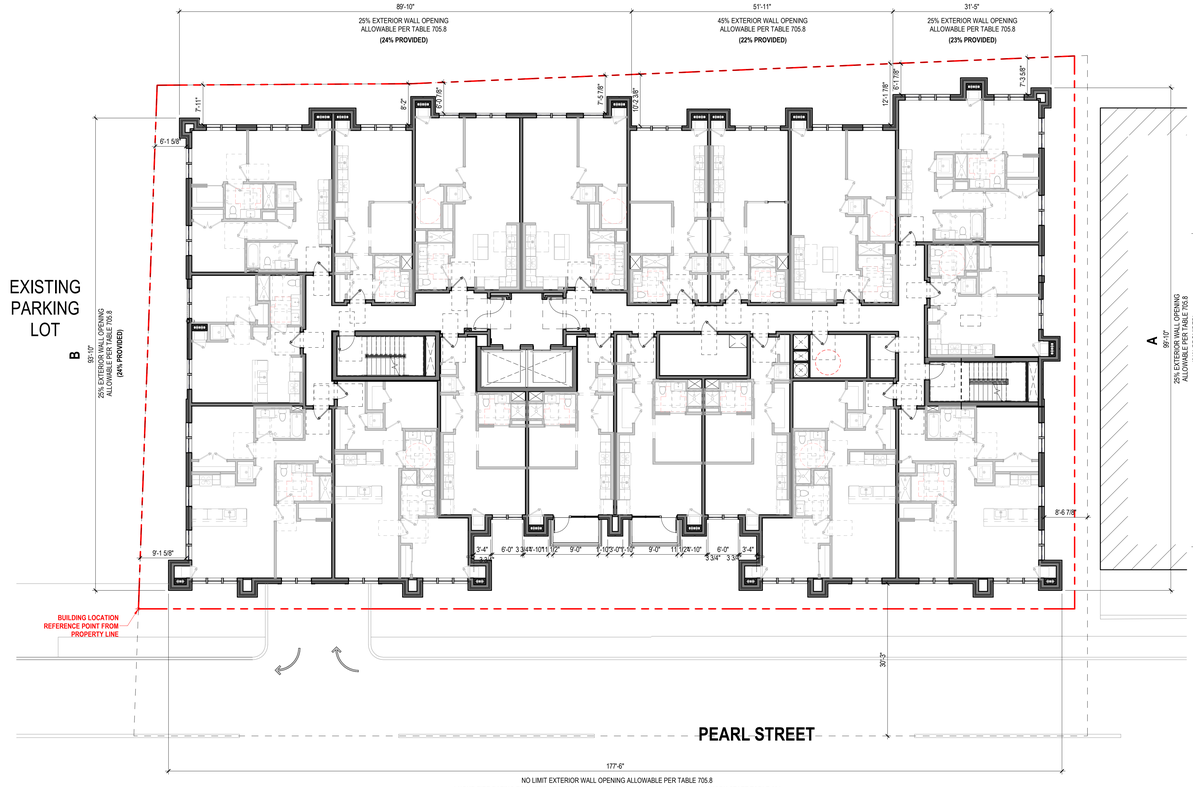
B
FSD = 7' 6"
25% EXTERIOR WALL OPENINGS ALLOWED



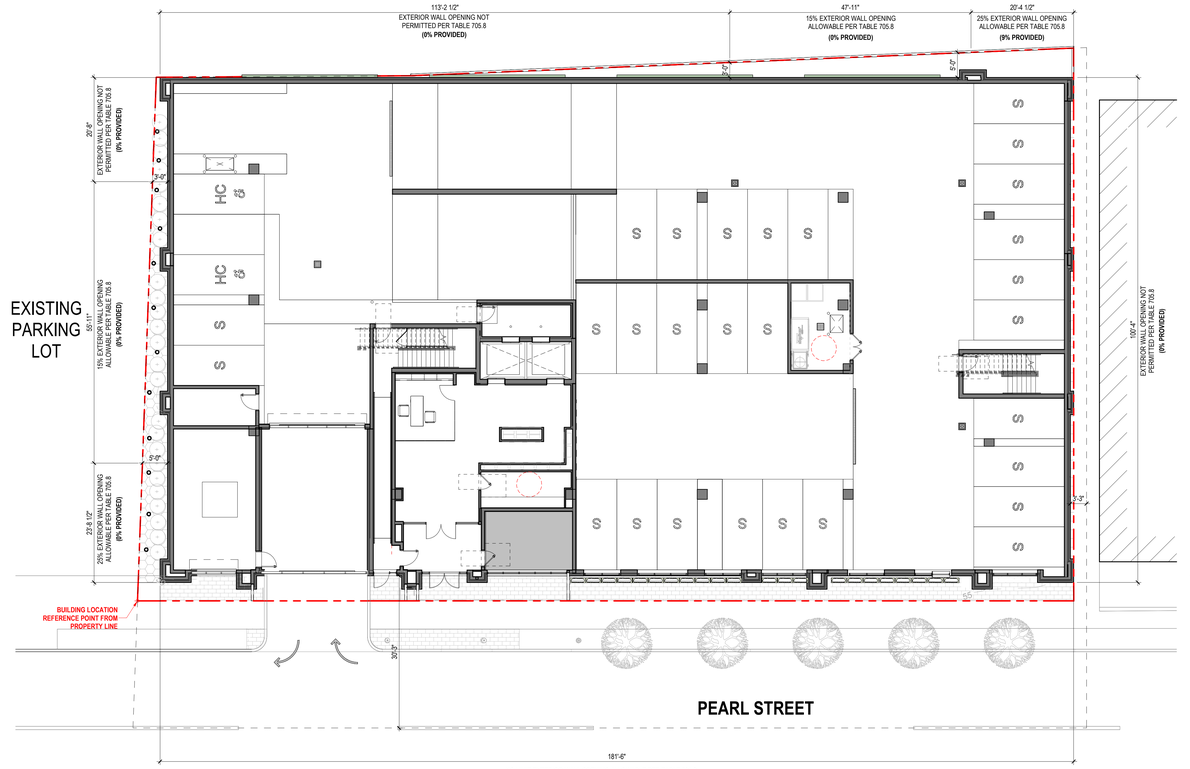
E
FSD = 6' 9"
25% EXTERIOR WALL OPENINGS ALLOWED



C
FSD = 7' 4"
25% EXTERIOR WALL OPENINGS ALLOWED



2 G-016 TYPICAL (3RD-8TH) FLOOR PLAN - FIRE SEPARATION DISTANCE PLAN
Scale: 3/32" = 1'-0"



1 G-016 FIRST FLOOR PLAN - FIRE SEPARATION DISTANCE PLAN
Scale: 3/32" = 1'-0"

ARCHITECT:
lessard DESIGN INC. P.C.
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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

FIRE SEPARATION DISTANCE / EXTERIOR FIRE RATING WALL PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 11:04:10 AM
FILE NAME:

G-016

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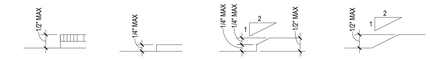
THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) - 2009 - MOUNTING HEIGHTS AND DESIGN CRITERIA

REFERENCE TO THE ENTIRE ANSI MANUAL MAY BE REQUIRED; IF SPECIFIC REFERENCES ARE NOT INCLUDED IN THIS DOCUMENT.

301 General
301.1 Scope. The provisions of Chapter 3 shall apply where required by the scoping provisions adopted by the administrative authority or by Chapters 4 through 11.
301.2 Overlap. Unless otherwise specified, clear floor spaces, clearances at fixtures, maneuvering clearances at doors, and turning spaces shall be permitted to overlap.

302 Floor Surfaces
302.1 General. Floor surfaces shall be stable, firm, and slip resistant, and shall comply with Section 302. Changes in level in floor surfaces shall comply with Section 303.
302.2 Carpet. Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The pile shall be 1/2 inch maximum in height. Exposed edges of carpet shall be fastened to the floor and shall have trim along the entire length of the exposed edge. Carpet edge trim shall comply with Section 303.
302.3 Openings. Openings in floor surfaces shall be of a size that does not permit the passage of a 1/2 inch diameter sphere, except as allowed in Sections 407.4.3, 408.4.3, 409.4.3, 410.4, and 805.10. Elongated openings shall be placed so that the long dimension is perpendicular to the predominant direction of travel.

303 Changes in Level
303.1 General: Changes in level in floor surfaces shall comply with Section 303.
303.2 Vertical: Changes in level of 1/4 inch maximum in height shall be permitted to be vertical.
303.3 Beveled: Changes in level greater than 1/4 inch in height and not more than 1/2 inch maximum in height shall be beveled with a slope not steeper than 1:2.
303.4 Ramps: Changes in level greater than 1/2 inch in height shall be ramped and shall comply with Section 405 or 406.

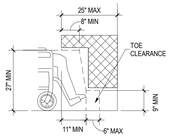


CARPET / GROUND SURFACE FIG 302.2 | VERTICAL LEVEL CHANGE FIG 303.2 | BEVELED LEVEL CHANGE FIG 303.3 (A) | BEVELED LEVEL CHANGE FIG 303.3 (B)

304 Turning Space
304.1 General: A turning space shall comply with Section 304.
304.2 Floor Surface: Floor surfaces of a turning space shall comply with Section 302. Changes in level are not permitted within the turning space.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.
304.3 Size: Turning spaces shall comply with Section 304.3.1 or 304.3.2.
304.3.1 Circular Space: The turning space shall be a circular space with a 60-inch minimum diameter. The turning space shall be permitted to include knee and toe clearance complying with Section 306.
304.3.2 T-Shaped Space: The turning space shall be a T-shaped space within a 60-inch minimum square, with arms and base 36 inches minimum in width. Each arm of the T shall be clear of obstructions 12 inches minimum in each direction, and the base shall be clear of obstructions 24 inches minimum. The turning space shall be permitted to include knee and toe clearance complying with Section 306 only at the end of either the base or one arm.
304.4 Door Swing: Unless otherwise specified, doors shall be permitted to swing into turning spaces.

305 Clear Floor Space
305.1 General: A clear floor space shall comply with Section 305.
305.2 Floor Surfaces: Floor surfaces of a clear floor space shall comply with Section 302. Changes in level are not permitted within the clear floor space.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.
305.3 Size. The clear floor space shall be 48 inches minimum in length and 30 inches minimum in width.
305.4 Knee and Toe Clearance. Unless otherwise specified, clear floor space shall be permitted to include knee and toe clearance complying with Section 306.
305.5 Position. Unless otherwise specified, the clear floor space shall be positioned for either forward or parallel approach to an element.
305.6 Approach. One full, unobstructed side of the clear floor space shall adjoin or overlap an accessible route or adjoin another clear floor space.
305.7 Alcoves: If a clear floor space is in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearances complying with Sections 305.7.1 and 305.7.2 shall be provided, as applicable.
305.7.1 Parallel Approach: Where the clear floor space is positioned for a parallel approach, the alcove shall be 60 inches minimum in width where the depth exceeds 15 inches.
305.7.2 Forward Approach: Where the clear floor space is positioned for a forward approach, the alcove shall be 36 inches minimum in width where the depth exceeds 24 inches.

306 Knee and Toe Clearance
306.1 General: Where space beneath an element is included as part of clear floor space at an element, clearance at an element, or a turning space, the space shall comply with Section 306. Additional space shall not be prohibited beneath an element, but shall not be considered as part of the clear floor space or turning space
306.2 Toe Clearance.
306.2.1 General: Space beneath an element between the floor and 9 inches above the floor shall be considered toe clearance and shall comply with Section 306.2.
306.2.2 Maximum Depth: Toe clearance shall be permitted to extend 25 inches maximum under an element.
306.2.3 Minimum Depth: Where toe clearance is required at an element as part of a clear floor space complying with Section 305, the toe clearance shall extend 17 inches minimum beneath the element.
306.2.4 Additional Clearance: Space extending greater than 6 inches beyond the available knee clearance at 9 inches above the floor shall not be considered toe clearance.
306.2.5 Width: Toe clearance shall be 30 inches minimum in width.



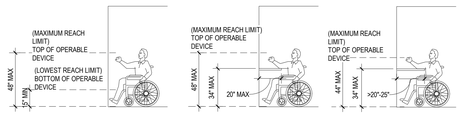
NOTE:
THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINK. CONFIGURE TO PROTECT AGAINST CONTACT OR TO PROTECT FROM BURNS, ABRASIONS, OR ELECTRICAL SHOCK.

KNEE & TOE CLEARANCES FIG 306.2/.3

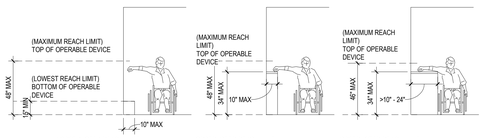
306.3 Knee Clearance.
306.3.1 General: Space beneath an element between 9 inches and 27 inches above the floor shall be considered knee clearance and shall comply with Section 306.3.
306.3.2 Maximum Depth: Knee clearance shall be permitted to extend 25 inches maximum under an element at 9 inches above the floor.
306.3.3 Minimum Depth: Where knee clearance is required beneath an element as part of a clear floor space complying with Section 305, the knee clearance shall be 11 inches minimum in depth at 9 inches above the floor, and 8 inches minimum in depth at 27 inches above the floor.
306.3.4 Clearance Reduction: Between 9 inches and 27 inches above the floor, the knee clearance shall be permitted to be reduced at a rate of 1 inch in depth for each 6 inches in height.
306.3.5 Width: Knee clearance shall be 30 inches minimum in width.

307 Protruding Objects
307.1 General: Protruding objects on circulation paths shall comply with Section 307.
307.2 Protrusion Limits: Objects with leading edges more than 27 inches and not more than 80 inches above the floor shall protrude 4 inches maximum horizontally into the circulation path.
EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches maximum.
307.3 Post-Mounted Objects: Objects on posts or pylons shall be permitted to overhang 4 inches maximum where more than 27 inches and not more than 80 inches above the floor. Objects on multiple posts or pylons where the clear distance between the posts or pylons is greater than 12 inches shall have the lowest edge of such object either 27 inches maximum or 80 inches minimum above the floor.
EXCEPTION: Sloping portions of handrails between the top and bottom riser of stairs and above the ramp run shall not be required to comply with Section 307.3.
307.4 Vertical Clearance: Vertical clearance shall be 80 inches minimum. Rails or other barriers shall be provided where the vertical clearance is less than 80 inches. The leading edge of such rails or barrier shall be located 27 inches maximum above the floor.
EXCEPTION: Door closers and door stops shall be permitted to be 78 inches minimum above the floor.
307.5 Required Clear Width: Protruding objects shall not reduce the clear width required for accessible routes.

308 Reach Ranges
308.1 General: Reach ranges shall comply with Section 308.
308.2 Forward Reach.
308.2.1 Unobstructed: Where a forward reach is unobstructed, the high forward reach shall be 48 inches maximum and the low forward reach shall be 15 inches minimum above the floor.
308.2.2 Obstructed High Reach: Where a high forward reach is over an obstruction, the clear floor space complying with Section 305 shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach hall be 48 inches maximum above the floor where the reach depth is 20 inches maximum. Where the reach depth exceeds 20 inches, the high forward reach shall be 44 inches maximum above the floor, and the reach depth shall be 25 inches maximum.



UNOBSTRUCTED REACH LIMIT WITH FORWARD APPROACH FIG. 308.2.1 | OBSTRUCTED REACH LIMIT WITH FORWARD APPROACH FIG 308.2.2 (A) | OBSTRUCTED REACH LIMIT WITH FORWARD APPROACH FIG 308.2.2 (B)



UNOBSTRUCTED REACH LIMIT WITH PARALLEL APPROACH FIG. 308.3.1 | OBSTRUCTED REACH LIMIT WITH PARALLEL APPROACH FIG. 308.3.2 (A) | OBSTRUCTED REACH LIMIT WITH PARALLEL APPROACH FIG. 308.3.2 (B)

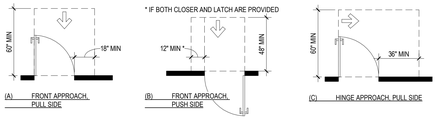
308.3 Side Reach.
308.3.1 Unobstructed: Where a clear floor space complying with Section 305 allows a parallel approach to an element and the edge of the clear floor space is 10 inches maximum from the element, the high side reach shall be 48 inches maximum and the low side reach shall be 15 inches minimum above the floor.
EXCEPTION: Existing elements that are not altered shall be permitted at 54 inches.
308.3.2 Obstructed High Reach: Where a clear floor space complying with Section 305 allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches maximum above the floor and the depth of the obstruction shall be 24 inches maximum. The high side reach shall be 48 inches maximum above the floor for a reach depth of 10 inches maximum. Where the reach depth exceeds 10 inches, the high side reach shall be 46 inches maximum above the floor for a reach depth of 24 inches maximum.
EXCEPTION: At washing machines and clothes dryers, the height of the obstruction shall be permitted to be 36 inches maximum above the floor.

309 Operable Parts
309.1 General: Operable parts required to be accessible shall comply with Section 309.
309.2 Clear Floor Space: A clear floor space complying with Section 305 shall be provided.
309.3 Height: Operable parts shall be placed within one or more of the reach ranges specified in Section 308.
309.4 Operation: Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5.0 pounds maximum.
EXCEPTION: Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5.0 pounds maximum.

Chapter 4 Accessible Routes

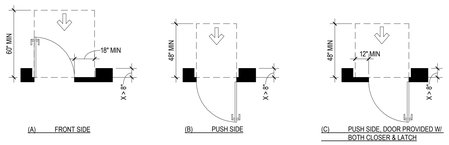
401 General
401.1 Scope: Accessible routes required by the scoping provisions adopted by the administrative authority shall comply with the applicable provisions of Chapter 4.
402 Accessible Routes
402.1 General: Accessible routes shall comply with Section 402.
402.2 Components: Accessible routes shall consist of one or more of the following components: Walking surfaces with a slope not steeper than 1:20, doors and doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable portions of this standard.
402.3 Revolving Doors, Revolving Gates, and Turnstiles. Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.
403.1 General. Walking surfaces that are a part of an accessible route shall comply with Section 403.
403.2 Floor Surface. Floor surfaces shall comply with Section 302.
403.3 Slope. The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of a walking surface shall not be steeper than 1:48.
403.4 Changes in Level. Changes in level shall comply with Section 303.
403.5 Clear Width. The clear width of an accessible route shall be 36 inches minimum.
EXCEPTION: The clear width shall be permitted to be reduced to 32 inches minimum for a length of 24 inches maximum provided the reduced width segments are separated by segments that are 48 inches minimum in length and 36 inches minimum in width.
403.5.1 Clear Width at 180 Degree Turn. Where an accessible route makes a 180 degree turn around an object that is less than 48 inches in width, clear widths shall be 42 inches minimum approaching the turn, 48 inches minimum during the turn, and 42 inches minimum leaving the turn.
EXCEPTION: Section 403.5.1 shall not apply where the clear width during the turn is 60 inches minimum.
403.5.2 Passing Space. An accessible route with a clear width less than 60 inches shall provide passing spaces at intervals of 200 feet maximum. Passing spaces shall be either a 60-inch minimum by 60-inch minimum space, or an intersection of two walking surfaces that provide a T- shaped turning space complying with section 304.3.2; provided the base and arms of the T-shaped space extend 48 inches minimum beyond the intersection.
403.6 Handrails. Where handrails are required at the side of a corridor they shall comply with Sections 505.4 through 505.9.
404 Doors and Doorways
404.1 General. Doors and doorways that are part of an accessible route shall comply with Section 404.
404.2 Manual Doors. Manual doors and doorways, and manual gates, including ticket gates, shall comply with Section 404.2.
EXCEPTION: Doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with Sections 404.2.6, 404.2.7, and 404.2.8.
404.2.1 Double-Leaf Doors and Gates. At least one of the active leaves of doorways with two leaves shall comply with Sections 404.2.2 and 404.2.3.
404.2.2 Clear Width. Doorways shall have a clear opening width of 32 inches minimum. Clear opening width of doorways with swinging doors shall be measured between the face of door and stop, with the door open 90 degrees. Openings more than 24 inches in depth at doors and doorways without doors shall provide a clear opening width of 36 inches minimum. There shall be no projections into the clear opening width lower than 34 inches above the floor. Projections into the clear opening width between 34 inches and 80 inches above the floor shall not exceed 4 inches.
EXCEPTIONS:
1. Door closers and door stops shall be permitted to be 78 inches minimum above the floor.
2. In alterations, a projection of 5/8 inch maximum into the required clear opening width shall be permitted for the latch side stop.

404.2.3 Maneuvering Clearances. Minimum maneuvering clearances at doors shall comply with Section 404.2.3 and shall include the full clear opening width of the doorway. Required door maneuvering clearances shall not include knee and toe clearance.
404.2.3.1 Floor Surface. Floor surface within the maneuvering clearances shall have a slope not steeper than 1:48 and shall comply with Section 302.
404.2.3.2 Swinging Doors. Swinging doors shall have maneuvering clearances complying with Table 404.2.3.2



MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS FIG. 404.2.3.2

404.2.3.3 Sliding and Folding Doors. Sliding doors and folding doors shall have maneuvering clearances complying with Table 404.2.3.3.



MANEUVERING CLEARANCE AT RECESSED DOORS FIG. 404.2.3.5

404.2.3.3 Sliding and Folding Doors. Sliding doors and folding doors shall have maneuvering clearances complying with Table 404.2.3.3.
404.2.3.4 Doorways without Doors. Doorways without doors that are less than 36 inches in width shall have maneuvering clearances complying with Table 404.2.3.4

Approach Direction	Minimum Maneuvering Clearances
From Front	48 inches
From Side	42 inches

404.2.3.5 Recessed Doors. Where any obstruction within 18 inches of the latch side of a doorway projects more than 8 inches beyond the face of the door, measured perpendicular to the face of the door, maneuvering clearances for a forward approach shall be provided.



MANEUVERING CLEARANCE AT SLIDING & FOLDING DOORS FIG. 404.2.3.3

404.2.4 Thresholds. If provided, thresholds at doorways shall be 1/2 inch maximum in height. Raised thresholds and changes in level at doorways shall comply with Sections 302 and 303.
EXCEPTION: An existing or altered threshold shall be permitted to be 3/4 inch maximum in height provided that the threshold has a beveled edge on each side with a maximum slope of 1:2 for the height exceeding 1/4 inch.
404.2.5 Two Doors in Series. Distance between two hinged or pivoted doors in series shall be 48 inches minimum plus the width of any door swinging into the space. The space between the doors shall provide a turning space complying with Section 304.
404.2.6 Door Hardware. Handles, pulls, latches, locks, and other operable parts on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching, or twisting of the wrist to operate. Operable parts of such hardware shall be 34 inches minimum and 48 inches maximum above the floor. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
EXCEPTION: Locks used only for security purposes and not used for normal operation shall not be required to comply with Section 404.2.6.
404.2.7 Closing Speed.
404.2.7.1 Door Closers. Door closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to an open position of 12 degrees shall be 5 seconds minimum.
404.2.7.2 Spring Hinges. Door spring hinges shall be adjusted so that from an open position of 70 degrees, the door shall move to the closed position in 1.5 seconds minimum.
404.2.8 Door-Opening Force. Fire doors shall have the minimum opening force allowable by the appropriate administrative authority. The force for pushing or pulling open doors other than fire doors shall be as follows:
1. Interior hinged door: 5.0 pounds maximum
2. Sliding or folding door: 5.0 pounds maximum
These forces do not apply to the forces required to retract latch bolts or disengage other devices that hold the door in a closed position.
404.2.9 Door Surface. Door surfaces within 10 inches of the floor, measured vertically, shall be a smooth surface on the push side extending the full width of the door. Parts creating horizontal or vertical joints in such surface shall be within 1/16 inch of the same plane as the other. Cavities created by added kick plates shall be capped.
EXCEPTIONS:
1. Doors shall not be required to comply with Section 404.2.9.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at no less than 60 degrees from the horizontal shall not be required to comply with the 10-inch bottom rail height requirement.
3. Doors that do not extend to within 10 inches of the floor shall not be required to comply with Section 404.2.9.

405 Ramps
405.1 General. Ramps along accessible routes shall comply with Section 405.
EXCEPTION: In assembly areas, aisle ramps adjacent to seating and not serving elements required to be on an accessible route shall not be required to comply with Section 405.
405.2 Slope. Ramp runs shall have a running slope greater than 1:20 and not steeper than 1:12.
EXCEPTION: In existing buildings or facilities, ramps shall be permitted to have slopes steeper than 1:12 complying with Table 405.2 where such slopes are necessary due to space limitations.
405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.
405.4 Floor Surfaces. Floor surfaces of ramp runs shall comply with Section 302.
405.5 Clear Width. The clear width of a ramp run shall be 36 inches minimum. Handrails and handrail supports that are provided on the ramp run shall not project into the required clear width of the ramp run.
405.6 Rise. The rise for any ramp run shall be 30 inches maximum.
405.7 Landings. Ramps shall have landings at the bottom and top of each ramp run. Landings shall comply with Section 405.7.
405.7.1 Slope. Landings shall have a slope not steeper than 1:48 and shall comply with Section 302.
405.7.2 Width. Clear width of landings shall be at least as wide as the widest ramp run leading to the landing.
405.7.3 Length. Landings shall have a clear length of 60 inches minimum.
405. 7.4 Change in Direction. Ramps that change direction at ramp landings shall be sized to provide a turning space complying with Section 304.3
405.7.5 Doorways. Where doorways are adjacent to a ramp landing, maneuvering clearances required by Sections 404.2.3 and 404.3.2 shall be permitted to overlap the landing area. Where a door that is subject to locking is located adjacent to a ramp landing, the landing shall be sized to provide a turning space complying with Section 304.3.
405.8 Handrails. Ramp runs with a rise greater than 6 inches shall have handrails complying with Section 505.
405.9 Edge Protection. Edge protection complying with Section 405.9.1 or 405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.
1. Edge protection shall not be required on ramps not required to have handrails and that have flared sides complying with section 406.3.
2. Edge protection shall not be required on the sides of ramp landings having a vertical drop-off of 1/2 inch maximum within 10 inches horizontally of the minimum landing area specified in Section 405.7.
4. Edge protection shall not be required on the sides of ramped aisles where the ramps provide access to the adjacent seats and aisle access ways.

405.9.1 Extended Floor Surface. The floor surface of the ramp run or ramp landing shall extend 12 inches minimum beyond the inside face of a railing complying with Section 505.
405.9.2 Curb or Barrier. A curb complying with Section 405.9.2.1 or a barrier complying with Section 405.9.2.2 shall be provided.
405.9.2.1 Curb. A curb shall be a minimum of 4 inches in height.
405.9.2.2 Barrier. Barriers shall be constructed so that the barrier prevents the passage of a 4-inch diameter sphere where any portion of the sphere is within 4 inches of the
405.10 Wet Conditions. Landings subject to wet conditions shall be designed to prevent the accumulation of water.

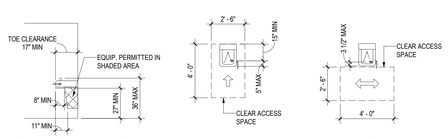
407 Elevators

407.1 General. Elevators shall comply with Section 407 and ASME A17.1/CSA B44 listed in Section 105.2.5. Elevators shall be passenger elevators as classified by ASME A17.1/CSA B44. Elevator operation shall be automatic.

Chapter 6 Plumbing Elements and Facilities

602 Drinking Fountains
602.1 General. Accessible drinking fountains shall comply with Sections 602 and 307.
602.2 Clear Floor Space. A clear floor space complying with Section 305, positioned for a forward approach to the drinking fountain, shall be provided. Knee and toe space complying with Section 306 shall be provided. The clear floor space shall be centered on the drinking fountain.
EXCEPTIONS:
1. Drinking fountains for standing persons.
2. Drinking fountains primarily for children's use shall be permitted where the spout outlet is 30 inches maximum above the floor, a parallel approach complying with Section 305 is provided and the clear floor space is centered on the drinking fountain.

602.4 Spout Outlet Height. Spout outlets of wheelchair accessible drinking fountains shall be 36 inches maximum above the floor. Spout outlets of drinking fountains for standing persons shall be 38 inches minimum and 43 inches maximum above the floor.
602.5 Spout Location. The spout shall be located 15 inches minimum from the vertical support and 5 inches maximum from the front edge of the drinking fountain, including bumpers. Where only a parallel approach is provided, the spout shall be located 3/12 inches maximum from the front edge of the drinking fountain, including bumpers.

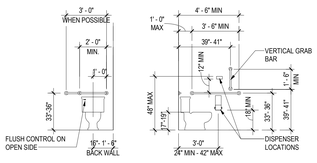


CLEARANCES @ DRINKING FOUNTAINS

602.6 Water Flow. The spout shall provide a flow of water 4 inches minimum in height. The angle of the water stream from spouts within 3 inches of the front of the drinking fountain shall be 30 degrees maximum, and from spouts between 3 inches and 5 inches from the front of the drinking fountain shall be 15 degrees maximum, measured horizontally relative to the front face of the drinking fountain.

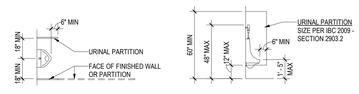
604 Water Closets and Toilet Compartments
604.5 Grab Bars. Grab bars for water closets shall comply with Section 609 and shall be provided in accordance with Sections 604.5.1 and 604.5.2. Grab bars shall be provided on the rear wall and on the side wall closest to the water closet.
EXCEPTIONS:
1. Grab bars are not required to be installed in a toilet room for a single occupant, accessed only through a private office and not for common use or public use, provided reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with Section 604.5.
2. In detention or correction facilities, grab bars are not required to be installed in housing or holding cells or rooms that are specially designed without protrusions for purposes of suicide prevention.

604.5.1 Fixed Side Wall Grab Bars. Fixed side-wall grab bars shall be 42 inches minimum in length, located 12 inches maximum from the rear wall and extending 54 inches minimum from the rear wall. In addition, a vertical grab bar 18 inches minimum in length shall be mounted with the bottom of the bar located 39 inches minimum and 41 inches maximum above the floor, and with the center line of the bar located 39 inches minimum and 41 inches maximum from the rear wall.
EXCEPTION: The vertical grab bar at water closets primarily for children's use shall comply with Section 609.4.2.
604.5.2 Rear Wall Grab Bars. The rear wall grab bar shall be 36 inches minimum in length, and extend from the centerline of the water closet 12 inches minimum on the side closest to the wall, and 24 inches Minimum on the transfer side.
EXCEPTIONS:
1. The rear grab bar shall be permitted to be 24 inches minimum in length, centered on the water closet, where wall space does not permit a grab bar 36 inches Minimum in length due to the location of a recessed fixture adjacent to the water closet.
2. Where an administrative authority requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, that grab bar shall be permitted to be split or shifted to the open side of the toilet area.



GRAB BARS @ WATER CLOSETS AND DISPENSER LOCATIONS FIG. 604.5.2 604.5.1

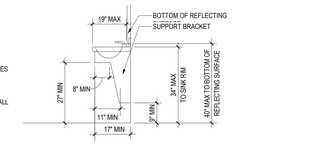
605 Urinals
605.1 General. Accessible urinals shall comply with Section 605.
605.2 Height and Depth. Urinals shall be of the stall type or shall be of the wall hung type with the rim at 17 inches maximum above the floor. Wall hung urinals shall be 13 1/2 inches minimum in depth measured from the outer face of the urinal rim to the wall.
605.3 Clear Floor Space. A clear floor space complying with Section 305, positioned for forward approach, shall be provided.
605.4 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with Section 309.



URINAL & PARTITION REQUIREMENTS FIG. 605.2

606 Lavatories and Sinks
606.1 General. Accessible lavatories and sinks shall comply with Section 606.
606.2 Clear Floor Space. A clear floor space complying with Section 305.3, positioned for forward approach, shall be provided. Knee and toe clearance complying with Section 306 shall be provided. The dip of the overflow shall not be considered in determining knee and toe clearances.
EXCEPTIONS:
1. A parallel approach complying with Section 306 and centered on the sink, shall be permitted to I a kitchen sink in a space where a cook top or conventional range is not provided.
2. The requirement for knee and toe clearance shall not apply to a lavatory in a toilet or bathing facility for a single occupant, accessed only through a private office and not for common use or public use.
3. A knee clearance of 24 inches minimum above the floor shall be permitted at lavatories and sinks used primarily by children ages 6 through 12 where the rim or counter surface is 31 inches maximum above the floor.
4. A parallel approach complying with Section 306 and centered on the sink, shall be permitted at lavatories and sinks used primarily by children ages 5 and younger.
5. The requirement for knee and toe clearance shall not apply to more than one bowl of a multi-bowl sink.
6. A parallel approach complying with Section 306 and centered on the sink, shall be permitted at wet bars.

606.3 Height. The front of lavatories and sinks shall be 34 inches maximum above the floor, measured to the higher of the rim or counter surface.
EXCEPTION: A lavatory in a toilet or bathing facility for a single occupant, accessed only through a private office and not for common use or public use, shall not be required to comply with Section 606.3.
606.4 Faucets. Faucets shall comply with Section 309. Hand-operated metering faucets shall remain open for 10 seconds minimum.
606.5 Lavatories with Enhanced Reach Range. Where enhanced reach range is required at lavatories, faucets and soap dispenser controls shall have a reach depth of 11 inches maximum or, if automatic, shall be activated within a reach depth of 11 inches maximum. Water and soap flow shall be provided with a reach depth of 11 inches maximum.
606.6 Exposed Pipes and Surfaces. Water supply and drainpipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.



NOTE:
WATER SUPPLY AND DRAIN PIPES UNDER THE SINK SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINK.

CLEARANCES @ ACCESSIBLE SINKS AND LAVATORIES FIG. 606.3

608 Shower Compartments
608.1 General. Accessible shower compartments shall comply with Section 608.
608.2 Size, clearance and seat. Shower compartments shall have sizes, clearances and seats complying with Section 608.2.
608.2.1 Transfer-type Shower Compartments. Transfer-type shower compartments shall comply with Section 608.2.1.
608.2.1.1 Size. Transfer-type shower compartments shall have a clear inside dimension of 36 inches in width and 36 inches in depth, measured at the center point of opposing sides. An entry 36 inches minimum in width shall be provided.
608.2.1.2 Clearance. A clearance of 48 inches minimum in length measured perpendicular from the control wall and 36 inches minimum in depth shall be provided adjacent to the open face of the compartment.
608.2.1.3 Seat. A folding or non-folding seat complying with Section 610 shall be provided on the wall opposite the control wall.
Exception: A seat is not required to be installed in a shower for a single occupant, accessed only through a private office and not for common use or public use, provided reinforcement has been installed in walls and located so as to permit the installation of a shower seat.
608.2.2 Standard Roll-in-type Shower Compartments. Standard roll-in-type shower compartments shall comply with Section 608.2.2.
608.2.2.1 Size. Standard roll-in-type shower compartments shall have a clear inside dimension of 60 inches minimum in width and 30 inches minimum in depth, measured at the center point of opposing sides. An entry 60 inches minimum in width shall be provided.
608.2.2.2 Clearance. A clearance of 60 inches minimum in length adjacent to the 60-inch width of the open face of the shower compartment, and 30 inches minimum in depth, shall be provided.
EXCEPTION: A lavatory complying with Section 606 shall be permitted at the end of the clearance opposite the seat.
608.2.2.3 Seat. A folding seat complying with Section 610 shall be provided on an end wall.
EXCEPTIONS:
1. A seat is not required to be installed in a shower for a single occupant accessed only through a private office and not for common use or public use, provided reinforcement has been installed in walls and located so as to permit the installation of a shower seat.
2. A fixed seat shall be permitted where the seat does not overlap the minimum clear inside dimension required by Section 608.2.2.1.

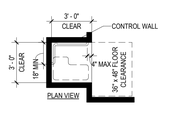


FIGURE 608.2.1
TRANSFER TYPE SHOWER COMPARTMENT SIZE AND CLEARANCE

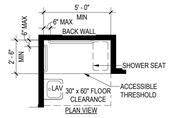


FIGURE 608.2.2
STANDARD ROLL-IN- SHOWER COMPARTMENT SIZE AND CLEARANCE

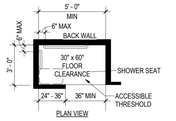


FIGURE 608.2.3
ALTERNATIVE ROLL-IN- SHOWER COMPARTMENT SIZE AND CLEARANCE

609 Grab Bars
609.1 General. Grab bars in accessible toilet or bathing facilities shall comply with Section 609.
609.2 Cross Section. Grab bars shall have a cross section complying with Section 609.2.1 or 609.2.2.
609.2.1 Circular Cross Section. Grab bars with a circular cross section shall have an outside diameter of 1 1/4 inch minimum and 2 inches maximum.
609.2.2 Noncircular Cross Section. Grab bars with a noncircular cross section shall have a cross section dimension of 2 inches maximum, and a perimeter dimension of 4 inches minimum and 4.8 inches maximum.
609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches. The space between the grab bar and projecting objects below and at the ends of the grab bar shall be 1 1/2 inches minimum. The space between the grab bar and projecting objects above the grab bar shall be 12 inches minimum.
EXCEPTIONS:
1. The space between the grab bars and shower controls, shower fittings, and other grab bars above the grab bar shall be permitted to be 1 1 /2 inches minimum.
2. Recessed dispensers projecting from the wall 1/4 inch maximum measured from the face of the dispenser and complying with Section 604.7 shall be permitted within the 12-inch space above and the 1 ½ inch spaces below and at the ends of the grab bar.

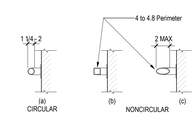


FIGURE 609.2
SIZE OF GRAB BARS

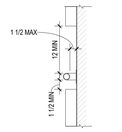


FIGURE 609.3
**SP

THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) - 2009 - MOUNTING HEIGHTS AND DESIGN CRITERIA

REFERENCE TO THE ENTIRE ANSI MANUAL MAY BE REQUIRED; IF SPECIFIC REFERENCES ARE NOT INCLUDED IN THIS DOCUMENT.

Chapter 10 Dwelling Units and Sleeping Units

1001.1 Scoping. Dwelling units and sleeping units required to be Accessible units, Type A units, Type B units, Type C (Visitable) units or units with accessible communication features by the scoping provisions adopted by the administrative authority shall comply with the applicable provisions of Chapter 10.

1003 Type A Units

1003.1 General. Type A units shall comply with Section 1003.

1003.2 Primary Entrance. The accessible primary entrance shall be on an accessible route from public and comment areas. The primary entrance shall not be to a bedroom unless it is the only entrance.

1003.3 Accessible Route. Accessible routes within Type A units shall comply with Section 1003.3.
At least one accessible route shall coincide with or be located in the same area as a general circulation path.

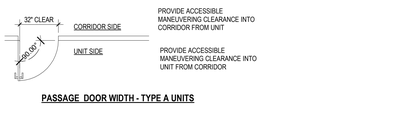
1003.3.1 Location. At least one accessible route shall connect all spaces and elements that are part of the unit. Accessible routes shall coincide with or be located in the same area as a general circulation path.
EXCEPTION: An accessible route is not required to unfinished attics and unfinished basements that are part of the unit.

1003.3.2 Turning Space. All rooms served by an accessible route shall provide a turning space complying with Section 304.
EXCEPTIONS:
1. A turning space is not required in toilet rooms and bathrooms that are not required to comply with Section 1003.11.2.
2. A turning space is not required within closets or pantries that are 48 inches maximum in depth.

1003.3.3 Components. Accessible routes shall consist of one or more of the following elements: walking surfaces with a slope not steeper than 1:20, doors and doorways, ramps, elevators, and platform lifts.

1003.4 Walking Surfaces. Walking surfaces that are part of an accessible route shall comply with Section 403.

1003.5 Doors and Doorways. The primary entrance door to the unit, and all other doorways intended for user passage, shall comply with Section 404.
EXCEPTIONS:
1. Thresholds at exterior sliding doors shall be permitted to be ¼ inch maximum in height provided they are beveled with a slope not greater than 1:2.
2. In toilet rooms and bathrooms not required to comply with Section 1003.11.2, maneuvering clearances required by Section 404.2.3 are not required on the toilet room or bathroom side of the door.
3. A turning space between doors in a series as required by Section 404.2.5 is not required.
4. Storm and screen doors are not required to comply with Section 404.2.5.
5. Communicating doors between individual sleeping units are not required to comply with Section 404.2.5.
6. At other than the primary entrance door, where exterior space dimensions of balconies are less than the required maneuvering clearance, door maneuvering clearance is not required on the exterior side of the door.



PASSAGE DOOR WIDTH - TYPE A UNITS

1003.6 Ramps. Ramps shall comply with Section 405.

1003.7 Elevators. Elevators within the unit shall comply with Section 407, 408, or 409.

1003.8 Platform Lifts. Platform lifts within the unit shall comply with Section. 410.

1003.9 Operable Parts. Lighting controls, electrical panelboards, electrical switches and receptacle outlets, environmental controls, appliance controls, operating hardware for operable windows, plumbing fixture controls, and user controls for security or intercom systems shall comply with Section 309.
EXCEPTIONS:
1. Receptacle outlets serving a dedicated use.
2. Where two or more receptacle outlets are provided in a kitchen above a length of counter top that is uninterrupted by a sink or appliance, one receptacle outlet shall not be required to comply with Section 309.
3. Floor receptacle outlets.
4. HVAC diffusers.
5. Controls mounted on ceiling fans
6. Where redundant controls other than light switches are provided for a single element, one control in each space shall not be required to be accessible.
7. Reset buttons and shut-offs serving appliances, piping and plumbing fixtures.
8. Electrical panelboards shall not be required to comply with Section 309.4.

1003.10 Laundry Equipment. Washing machines and clothes dryers shall comply with Section 611.

1003.11 Toilet and Bathing Facilities. At least one toilet and bathing facility shall comply with Section 1003.11.2. All toilet and bathing facilities shall comply with Section 1003.11.1.

1003.11.1 Grab Bar and Shower Seat Reinforcement. Reinforcement shall be provided for the future installation of grab bars complying with Section 604.5 at water closets; grab bars complying with Section 607.4 at bathtubs; and for grab bars and shower seats complying with Sections 608.3, 608.2.1. 3, 608.2.2.3 and 608.2.3.2 at shower compartments.
EXCEPTIONS:
1. At fixtures not required to comply with Section 1003.11.2, reinforcement in accordance with Section 1004.11.1 shall be permitted.
2. Reinforcement is not required in a room containing only a lavatory and a water closet, provided the room does not contain the only lavatory or water closet on the accessible level of the dwelling unit.
3. Reinforcement for the water closet side wall vertical grab bar component required by Section 604.5 is not required.
4. Where the lavatory overlaps the water closet clearance in accordance with the exception to section 1003.11.2.4.4 reinforcement at the water closet rear wall for a 24-inch minimum length grab bar, centered on the water closet, shall be provided.

1003.11.2 General. At least one toilet and bathing facility shall comply with Section 1003.1.2. At least one lavatory, one water closet and either a bathtub or shower within the unit shall comply with Section 1003.11.2. The accessible toilet and bathing fixtures shall be in a single toilet/bathing area, such that travel between fixtures does not require travel through other parts of the unit.

1003.11.2.1 Doors. Doors shall not swing into the clear floor space or clearance for any fixture.
EXCEPTION: Where a clear floor space complying with Section 305.3 is provided within the room beyond the arc of the door swing.

1003.11.2.2 Lavatory. Lavatories shall comply with Section 606.
EXCEPTION: Cabinetry shall be permitted under the lavatory, provided the following criteria are met:
(a) The cabinetry can be removed without removal or replacement of the lavatory;
(b) The floor finish extends under the cabinetry; and
(c) The walls behind and surrounding the cabinetry are finished.

1003.11.2.3 Mirrors. Mirrors above accessible lavatories shall have the bottom edge of the reflecting surface 40 inches maximum above the floor.

1003.11.2.4 Water Closet. Water closets shall comply with Section 1003.11.2.4.

1003.11.2.4.1 Location. The water closet shall be positioned with a wall to the rear and to one side. The centerline of the water closet shall be 16 inches minimum and 18 inches maximum from the sidewall.

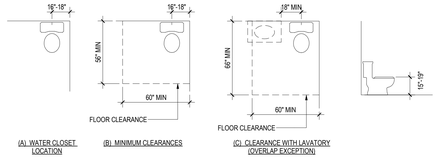
1003.11.2.4.2 Clearance Width. Clearance around the water closet shall be 60 inches minimum in width, measured perpendicular from the side wall.

1003.11.2.4.3 Clearance Depth. Clearance around the water closet shall be 56 inches minimum in depth, measured perpendicular from the rear wall.

1003.11.2.4.4 Clearance Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, paper dispensers, coat hooks, shelves, accessible routes, clear floor space required at other fixtures, and the wheelchair turning space. No other fixtures or obstructions shall be located within the required water closet clearance.
EXCEPTION: A lavatory measuring 24 inches maximum in depth and complying with Section 1003.11. 2.2 shall be permitted on the rear wall 18 inches minimum from the centerline of the water closet to the side edge of the lavatory where the clearance at the water closet is 66 inches minimum measured perpendicular from the rear wall.

1003.11.2.4.5 Height. The top of the water closet seat shall be 15 inches minimum and 19 inches maximum above the floor, measured to the top of the seat.

1003.11.2.4.6 Flush Controls. Flush controls shall be hand-operated or automatic. Hand operated flush controls shall comply with Section 309. Hand-operated flush controls shall be located on the open side of the water closet.



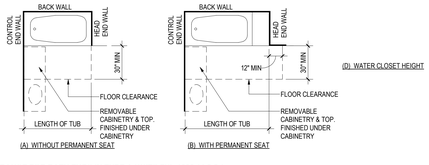
(A) WATER CLOSET LOCATION (B) MINIMUM CLEARANCES (C) CLEARANCE WITH LAVATORY (OVERLAP EXCEPTION)

WATER CLOSETS IN TYPE A UNITS FIG. 1003.11.2.4

1003.11.2.5 Bathing Fixtures. The accessible bathing fixture shall be a bathtub complying with Section 1003.11 .2.5.1 or a shower compartment complying with Section 1003.11.2.5.2.

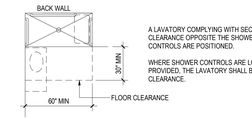
1003.11.2.5.1 Bathtub. Bathtubs shall comply with Section 607.
EXCEPTIONS:
1. The removable in-tub seat required by Section 607.3 is not required.
2. Counter tops and cabinetry shall be permitted at one end of the clearance, provided the following criteria are met:
(a) The countertop and cabinetry can be removed;
(b) The floor finish extends under the countertop and cabinetry; and
(c) The walls behind and surrounding the countertop and cabinetry are finished.

1003.11.2.5.2 Shower. Showers shall comply with Section 608.
EXCEPTION: At standard roll-in shower compartments complying with Section 608.2.2, lavatories, counter tops and cabinetry shall be permitted at one end of the clearance, provided the following criteria are met:
(a) The countertop and cabinetry can be removed;
(b) The floor finish extends under the countertop and cabinetry; and
(c) The walls behind and surrounding the countertop and cabinetry are finished.



(A) WITHOUT PERMANENT SEAT (B) WITH PERMANENT SEAT (D) WATER CLOSET HEIGHT

CLEARANCE FOR BATH TUBS IN TYPE A UNITS FIG. 1003.11.2.5.1



A LAVATORY COMPLYING WITH SECTION 608.2.2 IS PERMITTED AT THE END OF CLEARANCE OPPOSITE THE SHOWER COMPARTMENT SIDE WHERE SHOWER CONTROLS ARE POSITIONED.

WHERE SHOWER CONTROLS ARE LOCATED ON THE BACK WALL AND NO SEAT IS PROVIDED, THE LAVATORY SHALL BE PERMITTED AT EITHER END OF THE CLEARANCE.

STANDARD ROLL-IN-TYPE SHOWER COMPARTMENT IN TYPE A UNITS FIG. 1003.11.2.5.2

1003.12 Kitchens and kitchenettes. Kitchens and kitchenettes shall comply with section 1003.12.

1003.12.1 Clearance. Clearance complying with Section 1003.12.1 shall be provided.

1003.12.1.1 Minimum Clearance. Clearance between all opposing base cabinets, counter tops, appliances, or walls within kitchen work areas shall be 40 inches minimum.

1003.12.1.2 U-Shaped Kitchens. In kitchens with counters, appliances, or cabinets on three contiguous sides, clearance between all opposing base cabinets, countertops, appliances, or walls within kitchen work areas shall be 60 inches minimum.



(A) (B)

MINIMUM KITCHEN CLEARANCE IN TYPE A UNITS FIG. 1003.12.1.1

U-SHAPED KITCHEN CLEARANCE IN TYPE A UNITS FIG 1003.12.1.2

1003.12.2 Clear Floor Space. Clear floor spaces required by Sections 1003.12.3 through 1003.12.5 shall comply with Section 305.

1003.12.3 Work Surface. At least one section of counter shall provide a work surface 30 inches minimum in length complying with Section 1003.12.3.

1003.12.3.1 Clear Floor Space. A clear floor space, positioned for a forward approach to the work surface, shall be provided. Knee and toe clearance complying with Section 306 shall be provided. The clear floor space shall be centered on the work surface.
EXCEPTION: Cabinetry shall be permitted under the work surface, provided the following criteria are met:
(a) The cabinetry can be removed without removal or replacement of the work surface,
(b) The floor finish extends under the cabinetry, and
(c) The walls behind and surrounding the cabinetry are finished.

1003.12.3.2 Height. The work surface shall be 34 inches maximum above the floor.
EXCEPTION: A counter that is adjustable to provide a work surface at variable heights 29 inches minimum and 36 inches maximum above the floor, or that can be relocated within that range without cutting the counter or damaging adjacent cabinets, walls, doors, and structural elements, shall be permitted.

1003.12.3.3 Exposed Surfaces. There shall be no sharp or abrasive surfaces under the exposed portions of work surface counters.

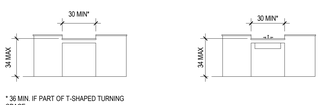
1003.12.4 Sink. The sink shall comply with section1003.12.4

1003.12.4.1 Clear Floor Space. A clear floor space positioned for a forward approach to the sink shall be provided. Knee and toe clearance complying with Section 306 shall be provided.
EXCEPTIONS:
1. The requirement for knee and toe clearance shall not apply to more than one bowl of a multi-bowl sink.
2. Cabinetry shall be permitted to be added under the sink, provided the following criteria are met:
(a) The cabinetry can be removed without removal or replacement of the sink,
(b) The floor finish extends under the cabinetry,
(c) The walls behind and surrounding the cabinetry are finished.

1003.12.4.2 Height. The front of the sink shall be 34 inches maximum above the floor, measured to the higher of the rim or counter surface.
EXCEPTION: A sink and counter that is adjustable to variable heights 29 inches minimum and 36 inches maximum above the floor, or that can be relocated within that range without cutting the counter or damaging adjacent cabinets, walls, doors and structural elements, provided rough-in plumbing permits connections of supply and drain pipes for sinks mounted at the height of 29 inches, shall be permitted.

1003.12.4.3 Faucets. Faucets shall comply with Section 309.

1003.12.4.4 Exposed Pipes and Surfaces. Water supply and drain pipes under sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under sinks.



* 36 MIN. IF PART OF T-SHAPED TURNING SPACE

WORK SURFACE FOR KITCHENS TYPE A UNITS FIG 1003.12.3 AND 1003.12.4

1003.12.5 Appliances. Where provided, kitchen appliances shall comply with Section 1003.12.5.

1003.12.5.1 Operable Parts. All appliance controls shall comply with Section 1003.9.
EXCEPTIONS:
1. Appliance doors and door latching devices shall not be required to comply with Section 309.4.
2. Bottom-hinged appliance doors, when in the open position, shall not be required to comply with Section 309.3.

1003.12.5.2 Clear Floor Space. A clear floor space, positioned for a parallel or forward approach, shall be provided at each kitchen appliance.

1003.12.5.3 Dishwasher. A clear floor space, positioned adjacent to the dishwasher door, shall be provided. The dishwasher door in the open position shall not obstruct the clear floor space for the dishwasher or an adjacent sink.

1003.12.5.4 Cooktop. Cooktops shall comply with Section 1003.1 2.5.4.

1003.12.5.4.1 Approach. A clear floor space, positioned for a parallel or forward approach to the cooktop, shall be provided.

1003.12.5.4.2 Forward approach. Where the clear floor space is positioned for a forward approach, knee and toe clearance complying with Section 306 shall be provided. The underside of the cooktop shall be insulated or otherwise configured to protect from burns, abrasions, or electrical shock.

1003.12.5.4.3 Parallel approach. Where the clear floor space is positioned for a parallel approach, the clear floor space shall be centered on the appliance.

1003.12.5.4.4 Controls. The location of controls shall not require reaching across burners.

1003.12.5.5 Oven. Ovens shall comply with Section 1003.12.5.5. Ovens shall have controls on front panels, on either side of the door.

1003.12.5.5.1 Clear floor space. A clear floor space shall be provided. The oven door in the open position shall not obstruct the clear floor space for the oven.

1003.12.5.5.2 Side-Hinged Door Ovens. Sidehinged door ovens shall have a counterlop positioned adjacent to the latch side of the oven door.

1003.12.5.5.3 Bottom-Hinged Door Ovens. Bottom-hinged door ovens shall have a countertop positioned adjacent to one side of the door.

1003.12.5.5.4 Controls. The location of controls shall not require reaching across burners.

1003.12.5.6 Refrigerator/Freezer. Combination refrigerators and freezers shall have at least 50 percent of the freezer compartment shelves, including the bottom of the freezer 54 inches maximum above the floor when the shelves are installed at the maximum heights possible in the compartment. A clear floor space, positioned for a parallel approach to the refrigerator/freezer, shall be provided. The centerline of the clear floor space shall be offset 24 inches maximum from the centerline of the appliance.

1003.13 Windows. Windows shall comply with Section 1003. 13.

1003.13.1 Natural ventilation. Operable windows required to provide natural ventilation shall comply with Sections 309.2 and 309.3.

1003.13.2 Emergency escape. Operable windows required to provide an emergency escape and rescue opening shall comply with Section 309.2.

1003.14 Storage Facilities. Where storage facilities are provided, at least one of each type shall comply with Section 905.
EXCEPTION: Kitchen cabinets shall not be required to comply with Section 1003. 14.

1004 Type B Units

1004.1 General. Type B units shall comply with Section 1004.

1004.2 Primary Entrance. The accessible primary entrance shall be on an accessible route from public and common areas. The primary entrance shall not be to a bedroom unless it is the only entrance.

1004.3 Accessible Route. Accessible routes within Type B units shall comply with Section 1004.3.

1004.3.1 Location. At least one accessible route shall connect all spaces and elements that are a part of the unit. Accessible routes shall coincide with or be located in the same area as a general circulation path.
EXCEPTIONS:
1. An accessible route is not required to unfinished attics and unfinished basements that are part of the unit.
2. One of the following is not required to be on an accessible route:
2.1 A raised floor area in a portion of a living, dining, or sleeping room; or
2.2 A sunken floor area in a portion of a living, dining, or sleeping room; or
2.3 A mezzanine that does not have plumbing fixtures or an enclosed habitable space.

1004.3.2 Components. Accessible routes shall consist of one or more of the following elements: walking surfaces with a slope not steeper than 1:20, doors and doorways, ramps, elevators, and platform lifts.

1004.4 Walking Surfaces. Walking surfaces that are part of an accessible route shall comply with Section 1004.4.

1004.4.1 Clear Width. Clear width of an accessible route shall comply with Section 403.5.

1004.4.2 Changes in Level. Changes in level shall comply with Section 303.
EXCEPTION: Where exterior deck, patio or balcony surface materials are impervious, the finished exterior impervious surface shall be 4 inches maximum below the floor level of the adjacent interior spaces of the unit.

1004.5 Doors and Doorways. Doors and doorways shall comply with Section 1004.5.

1004.5.1 Primary Entrance Door. The primary entrance door to the unit shall comply with Section. 404.
EXCEPTION: Storm and screen doors serving individual dwelling or sleeping units are not required to comply with Section 404.2.5.

1004.5.2 User Passage Doorways. Doorways intended for user passage shall comply with Section 1004.5.2.

1004.5.2.1 Clear Width. Doorways shall have a clear opening of 31 3/4 inches minimum. Clear opening of swinging doors shall be measured between the face of the door and stop, with the door open 90 degrees.

1004.5.2.1.1 Double Leaf Doorways. Where the operable parts on an inactive leaf of a double leaf doorway are located more than 48 inches or less than 15 inches above the floor, the active leaf shall provide the clearance required by Section 1004.5.2.1.

1004.5.2.2 Thresholds. Thresholds shall comply with Section 303.
EXCEPTION: Thresholds at exterior sliding doors shall be permitted to be 3/4 inch maximum in height, provided they are beveled with a slope not steeper than 1:2.

1004.5.2.3 Automatic Doors. Automatic doors shall comply with Section 404.3.

1004.6 Ramps. Ramps shall comply with Section 405.

1004.7 Elevators. Elevators within the unit shall comply with Section 407.408, or 409.

1004.8 Platform Lifts. Platform lifts within the unit shall comply with Section 410.

1004.9 Operable Parts. Lighting controls, electrical switches and receptacle outlets, environmental controls, electrical panelboards, and user controls for security or intercom systems shall comply with Sections 309.2 and 309.3.
EXCEPTIONS:
1. Receptacle outlets serving a dedicated use.
2. Where two or more receptacle outlets are provided in a kitchen above a length of counter top that is uninterrupted by a sink or appliance, one receptacle outlet shall not be required to comply with Section 309.
3. Floor receptacle outlets.
4. HVAC diffusers.
5. Controls mounted on ceiling fans.
6. Controls or switches mounted on appliances.
7. Plumbing fixture controls.
8. Reset buttons and shut-offs serving appliances, piping and plumbing fixtures.
9. Where redundant controls other than light switches are provided for a single element, one control in each space shall not be required to be accessible.
10. Within kitchens and bathrooms, lighting controls, electrical switches and receptacle outlets are permitted to be located over cabinets with counter tops 36 inches maximum in height and 25 1/2 inches maximum in depth.

1004.10 Laundry Equipment. Washing machines and clothes dryers shall comply with Section 1004.10.

1004.10.1 Clear Floor Space. A clear floor space complying with Section 305.3 shall be provided. A parallel approach shall be provided for a top loading machine. A forward or parallel approach shall be provided for a front loading machine.

1004.11 Toilet and Bathing Facilities. Toilet and bathing fixtures shall comply with Section 1004.11.
EXCEPTION: Fixtures on levels not required to be accessible.

1004.11.1 Grab Bar and Shower Seat Reinforcement. Reinforcement shall be provided for the future installation of grab bars and shower seats at water closets, bathtubs, and shower compartments. Where walls are located to permit the installation of grab bars and seats complying with Section 604.5 at water closets; grab bars complying with Section 607.4 at bathtubs; and for grab bars and shower seats complying with sections. 608.3, 608.2.1.3, 608.2.2.3 and 608.2.3.2 at shower compartments; reinforcement shall be provided for the future installation of grab bars and seats complying with those requirements.
EXCEPTIONS:
1. In a room containing only a lavatory and a water closet, reinforcement is not required provided the room does not contain the only lavatory or water closet on the accessible level of the unit.
2. At water closets reinforcement for the side wall vertical grab bar component required by Section 604.5 is not required.
3. At water closets where wall space will not permit a grab bar complying with Section 604.5.2, reinforcement for a rear wall grab bar 24 inches minimum in length centered on the water closet shall be provided.
4. At water closets where a side wall is not available for a 42-inch grab bar complying with Section 604.5.1, reinforcement for a sidewall grab bar, 24 inches minimum in length, located 12 inches maximum from the rear wall, shall be provided.
5. At water closets where a side wall is not available for a 42-inch grab complying with Section 604.5.1 reinforcement for a swing-up grab bar complying with Section 1004.11.1.1 shall be permitted.
6. At water closets where a side wall is not available for a 42-inch grab complying with Section 604.5.1 reinforcement for two swingup grab bars complying with Section 1004.11.1.1 shall be permitted to be installed in lieu of reinforcement for rear wall and side wall grab bar.
7. In shower compartments larger than 36 inches in width and 36 inches in depth reinforcement for a shower seat is not required.

1004.11.1.1 Swing-Up Grab Bars. A clearance of 18 inches minimum from the centerline of the water closet to any side wall or obstruction shall be provided where reinforcement for swing-up bars is provided. When the approach to the water closet is from the side, the 18 inches minimum shall be on the side opposite the direction of approach. Reinforcement shall accommodate a swing-up grab bar centered 15 3/4 inches from the centerline of the water closet and 28 inches minimum in length, measure from the wall to the end of the horizontal portion of the grab bar. Reinforcement shall accommodate a swing-up grab bar with a height in the down position of 33 inches minimum and 36 inches maximum. Reinforcement shall be adequate to resist forces in accordance with Section 609.8.
EXCEPTION: Where the water closet is positioned with a wall to the rear and to one side, the centerline of the water closet shall be 16 inches minimum and 18 inches maximum from the sidewall.

1004.11.2 Clear Floor Space. Clear floor spaces required by Section 1004.11.3.1 (Option A) or 1004.11.3.2 (Option B) shall comply with Sections 1004.11.2 and 305.3.

1004.11.2.1 Doors. Doors shall not swing into the clear floor space or clearance for any fixture.
EXCEPTION: Where a clear floor space complying with Section 305.3, excluding knee and toe clearances under elements, is provided within the room beyond the arc of the door swing.

1004.11.2.2 Knee and Toe Clearance. Clear floor space at fixtures shall be permitted to include knee and toe clearance complying with Section 306.

1004.11.3 Toilet and Bathing Areas. Either all toilet and bathing areas provided shall comply with Section 1004.11.3.1 (Option A) or one toilet and bathing area shall comply with Section 1004.11.3.2 (Option B).

1004.11.3.1 Option A. Each fixture provided shall comply with Section 1004.11.3.1.
EXCEPTIONS:
1. Where multiple lavatories are provided in a single toilet and bathing area such that travel between fixtures does not required travel through other parts of the unit, not more than one lavatory is required to comply with Section 1004.11.3.1.
2. A lavatory and a water closet in a room containing only a lavatory and water closet, provided the room does not contain the only lavatory or water closet on the accessibly level of the unit.

1004.11.3.1.1 Lavatory. A clear floor space complying with Section 305.3, positioned for a parallel approach, shall be provided at a lavatory. The clear floor space shall be centered on the lavatory.

EXCEPTION: A lavatory complying with Section 606 shall be permitted. Cabinetry shall be permitted under the lavatory provided the following criteria are met:
(a) The cabinetry can be removed without removal or replacement of the lavatory; and
(b) The floor finish extends under the cabinetry; and
(c) The walls behind and surrounding the cabinetry are finished.

1004.11.3.1.2 Water Closet. The water closet shall comply with Section 1004.11.3.1.2.

1004.11.3.2.1 Location. The centerline of the water closet shall be 16 inches and 18 inches maximum from one side of the required clearance.

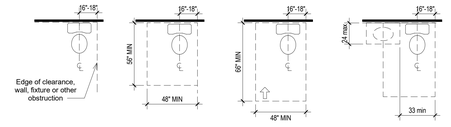
1004.11.3.1.2.2 Clearance. Clearance around the water closet shall comply with Sections 1004.11.3.1.2.2.1 through 1004.11.3.1.2.2.3
EXCEPTION: Clearance complying with Sections 1003.11.2.4.2 through 1003.11.2.4.4.

1004.11.3.1.2.2.1 Clearance Width. Clearance around the water closet shall be 48 inches minimum in width, measure perpendicular from the side of the clearance that is 16 inches minimum and 18 inches maximum from the water closet centerline.

1004.11.3.1.2.2.2 Clearance Depth. Clearance around the water closet shall be 56 inches minimum in depth, measured perpendicular from the rear wall.

1004.11.3.1.2.2.3 Increased Clearance Depth at Forward Approach. Where a forward approach is provided, the clearance shall be 66 inches minimum in depth, measured perpendicular from the rear wall

1004.11.3.1.2.2.4 Clearance Overlap. A vanity or other obstruction 24 inches maximum in depth, measured perpendicular from the rear wall, shall be permitted to overlap the required clearance, provided the width of the remaining clearance at the water closet is 33 inches minimum.

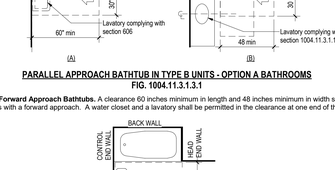


(A) Water closet location (B) Clearance width and depth (C) Clearance width and depth-forward approach (D) Clearance with lavatory overlap

WATER CLOSETS IN TYPE B UNITS FIG. 1004.11.3.1.2

1004.11.3.1.3 Bathing Fixtures. Where provided, a bathtub shall comply with Section 1004.11.3.1.3.1 or 1004.11.3.1.3.2 and a shower compartment shall comply with Section 1004.11.3.1.3.3.

1004.11.3.1.3.1 Parallel Approach Bathtubs. A clearance 60 inches minimum in length and 30 inches minimum in width shall be provided in front of bathtubs with a parallel approach. Lavatories complying with Section 606 shall be permitted in the clearance. A lavatory complying with Section 1004.11.3.1.1 shall be permitted at one end of the bathtub if a clearance 48 inches minimum in length and 30 inches minimum in width provided in front of the bathtub.



(A) (B)

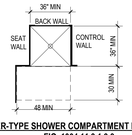
PARALLEL APPROACH BATHTUB IN TYPE B UNITS - OPTION A BATHROOMS FIG. 1004.11.3.1.3.1

1004.11.3.1.3.2 Forward Approach Bathtubs. A clearance 60 inches minimum in length and 48 inches minimum in width shall be provided in front of bathtubs with a forward approach. A water closet and a lavatory shall be permitted in the clearance at one end of the bathtub.



FORWARD APPROACH BATHTUB IN TYPE B UNITS - OPTION A BATHROOMS FIG. 1004.11.3.1.3.2

1004.11.3.1.3.3 Shower Compartment. If a shower compartment is the only bathing facility, the shower compartment shall have dimensions of 36 inches minimum in width and 36 inches minimum in depth. A clearance of 48 inches minimum in length, measured perpendicular from the shower head wall, and 30 inches minimum in depth, measured from the face of the shower compartment, shall be provided. Reinforcing for a shower seat is not required in shower compartment larger than 36 inches in width and 36 inches in depth.

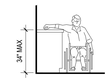


TRANSFER-TYPE SHOWER COMPARTMENT IN TYPE B UNITS FIG. 1004.11.3.1.3.3

1004.11.3.2 Option B. One of each type of fixture provided shall comply with Section 1004.11.3.2. The accessible fixtures shall be in a single toilet/bathing area, such that travel between fixtures does not require travel through other parts of the unit.

1004.11.3.2.1 Lavatory. Lavatories shall comply with Sections 1004.11.3.1.1 and 1004.11.3.2.1.1.

1004.11.3.2.1.1 Height. The front of the lavatory shall be 34 inches maximum above the floor, measured to the higher of the rim or counter surface.



LAVATORY IN TYPE B UNITS - OPTION B BATHROOMS
FIG. 1004.11.3.2.1

1004.11.3.2.2 Water Closet. The water closet shall comply with Section 1004.11.3.1.2.

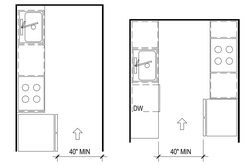
1004.11.3.2.3 Bathing Fixtures. The accessible bathing fixture shall be a bathtub complying with Section 1004.11.3.2.3.1 or a shower compartment complying with Section 1004.11.3.2.3.2.

1004.11.3.2.3.1 Bathtub. A clearance 48 inches minimum in length measured perpendicular from the control end of the bathtub, and 30 inches minimum in width shall be provided in front of bathtubs.



BATHTUB CLEARANCE IN TYPE B UNITS - OPTION B BATHROOMS FIG. 1004.11.3.2.3.1

1004.11.3.2.3.2 Shower Compartment. A shower compartment shall comply with Section 1004.11.3.1.3.3.
1004.12 Kitchens and kitchenettes. Kitchens and kitchenettes shall comply with Section 1004. 12.
1004.12.1 Clearance. Clearance complying with Section 1004.12.1 shall be provided.
1004.12.1.1 Minimum Clearance. Clearance between all opposing base cabinets, counter tops, appliances, or walls within kitchen work areas shall be 40 inches minimum.



(A) (B)

MINIMUM KITCHEN CLEARANCE IN TYPE B UNITS FIG. 1004.12.1.1

1004.12.1.2 U-Shaped Kitchens. In kitchens with counters, appliances, or cabinets on three contiguous sides, clearance between all opposing base cabinets, countertops, appliances, or walls within kitchen work areas shall be 60 inches minimum.



U-SHAPED KITCHEN CLEARANCE IN TYPE B UNITS FIG 1004.12.1.2

1004.12.2 Clear Floor Space. Clear floor space at appliances shall comply with Sections 1004.12.2 and 305.3.

1004.12.2.1 Sink. A clear floor space, positioned for a parallel approach to the sink, shall be provided. The clear floor space shall be centered on the sink bowl.
EXCEPTION: A sink with a forward approach complying with Section 1003.12.4.1.

1004.12.2.2 Dishwasher. A clear floor space, positioned for a parallel or forward approach to the dishwasher, shall be provided. The dishwasher door in the open position shall not obstruct the clear floor space for the dishwasher.

1004.12.2.3 Cooktop. cooktop shall comply with Section 1004.12.2.3.

1004.12.2.3.1 Approach. A clear floor space, positioned for a parallel or forward approach to the cooktop, shall be provided.

1004.12.2.3.2 Forward approach. Where the clear floor space is positioned for a forward approach, knee and toe clearance complying with Section 306 shall be provided. The underside of the cooktop shall be insulated or otherwise configured to prevent burns, abrasions, or electrical shock.

1004.12.2.3.3 Parallel approach. Where the clear floor space is positioned for a parallel approach, the clear floor space shall be centered on the appliance.

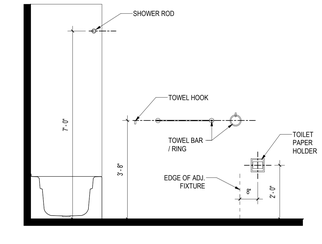
1004.12.2.4 Oven. A clear floor space, positioned for a parallel or forward approach adjacent to the oven shall be provided. The oven door in the open position shall not obstruct the clear floor space for the oven.

1004.12.2.5 Refrigerator/Freezer. A clear floor space, positioned for a parallel approach to the refrigerator/freezer, shall be provided. The centerline of the clear floor space shall be offset 24 inches maximum from the centerline of the appliance.

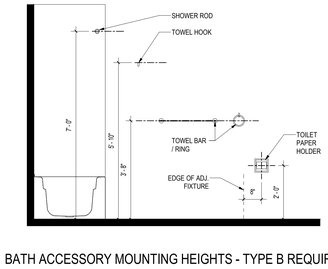
1004.12.2.6 Trash Compactor. A clear floor space, positioned for a parallel or forward approach to the trash compactor, shall be provided.

LEGEND

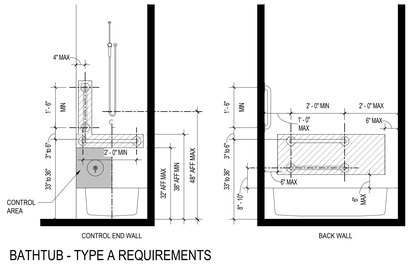
- BLOCKING LOCATIONS
- CONTROL LOCATIONS
- CLEARANCES
- FIXTURE LOCATIONS
- CENTERLINE



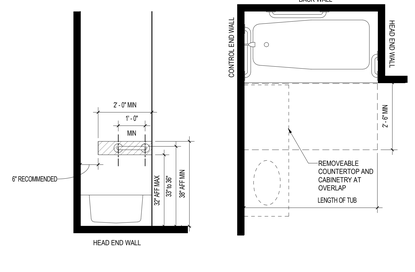
BATH ACCESSORY MOUNTING HEIGHTS - TYPE A REQUIREMENTS

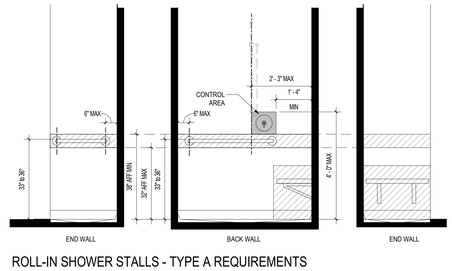


BATH ACCESSORY MOUNTING HEIGHTS - TYPE B REQUIREMENTS

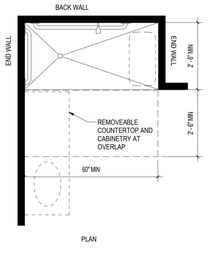


BATHTUB - TYPE A REQUIREMENTS





ROLL-IN SHOWER STALLS - TYPE A REQUIREMENTS



ARCHITECT:
lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:

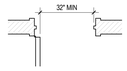


FIGURE # 01

USABLE DOOR

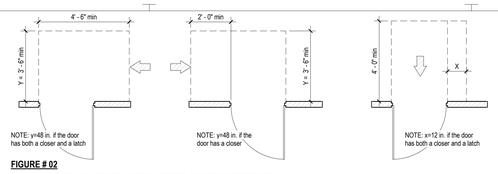


FIGURE # 02

CLEARANCE AT DWELLING UNIT ENTRY DOOR ON ACCESSIBLE ROUTE ON EXTERIOR SIDE

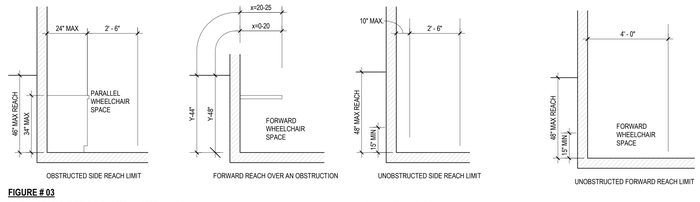


FIGURE # 03

REACH LIMITS FOR WHEELCHAIR USERS NOTE: x-reach depth, y=reach height, z= clear knee space, z is the clear space below the obstruction which shall be at least as deep as the reach distance, x.

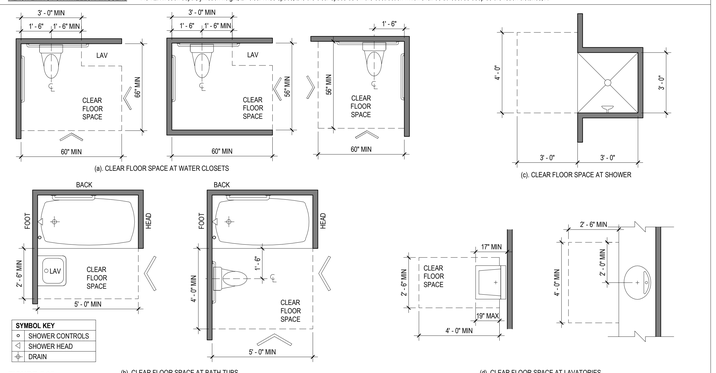


FIGURE # 05

CLEAR FLOOR SPACE FOR ADAPTABLE BATHROOMS

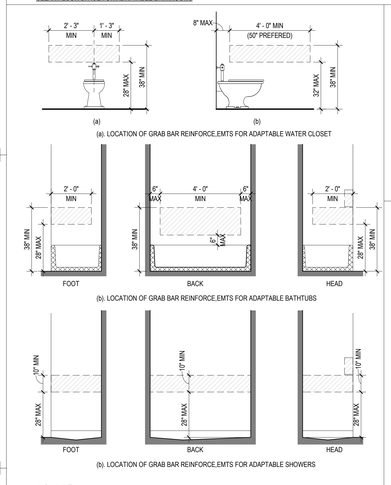


FIGURE # 04

LOCATION OF GRAB BAR REINFORCEMENTS

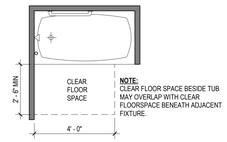


FIGURE # 06

ALTERNATE CLEAR FLOOR SPACE AT BATHTUB

FAIR HOUSING ACT DESIGN (1998 EDITION) FOR TYPE B UNITS

FAIR HOUSING ACT DESIGN MANUAL FHADM (1998 EDITION) WITH ANSI A117.1-2009

GENERAL

Information contained on sheet FHA-1 is intended to provide detailed technical provisions for features within a dwelling unit. Scope requirements are provided within these specifications.

These specifications in no way relieve the contractor from obtaining and conforming with the standards referenced herein.

The act is a federal civil rights law, and as such all new construction must comply with the act. Where state and local codes differ in technical aspects and or scope requirements with the act, the more stringent shall be followed.

The act applies to all covered multi-family dwellings containing 4 or more dwelling units if such buildings have one or more elevators, and all ground floor dwelling units in other buildings containing four or more units.

Note: for a unit to fall within the act, all finished living space must be on the same floor. Multi-story dwelling units are covered on the primary entry level in buildings with elevators.

II TECHNICAL REQUIREMENTS

Requirements 1 - Accessible Building Entrance on an Accessible Route.

At least one building entrance shall be on an accessible route. See architectural plans for designation of accessible entrance if more than one entrance is provided. This requirement provides scope and technical requirements of the site. See civil engineer drawings for further information.

Requirement 2 - Accessible and Usable Public and Common Use Areas

All common and public use spaces must comply with the technical requirements of ANSI A117.1 - 1986 Standard, or later edition provided the requirements of the later edition provides an equivalent or stricter standard.

In residential projects common spaces which are open to the public (in addition to resident and guest use) are considered "public accommodation", and must comply with Americans with Disabilities Act (ADA) Requirements, in addition to Fair Housing Requirements. See additional requirements for public and common use areas elsewhere in the construction documents.

Requirements 3.0 Usable Doors

3.1 On accessible routes in public and common use areas, and the exterior side of the primary entrance into dwelling units, doors shall comply with all the requirements of ANSI A 4.13, except floor area on public side of door only shall comply with [Figure #2]. The doors shall also have a minimum 32" clear opening per [Figure #1].

3.2 Within the dwelling unit all passage doors must provide a 32" clear opening. [See Figure # 1]

Requirement 4 Accessible Route Into and Through the Covered Dwelling Units.

1. A minimum clear width of 36 inches is provided.

2. In single-story dwelling units, changes in level within the dwelling unit with heights between 1/4 inch and 1/2 inch are beveled with a slope no greater than 1:2. Where a single story dwelling unit has special design features, all portions of the single-story unit, except the loft or the sunken or raised area, are on an accessible route; and
   (a) In single-story dwellings with lofts, all spaces other than the loft are on an accessible route.
   (b) Design features such as sunken or raised functional areas do not interrupt the accessible route through the remainder of the dwelling unit.

Note: Attached garages and basements to the dwelling unit must have a usable door, but are not required to be on an accessible route as non-living spaces.

3. In multistory dwelling units in buildings with elevators, the story of the unit that is served by the building elevator (a) is the primary entry to the unit, (b) complies with Requirements 2 through 7 with respect to the rooms located on the entry/accessible floor; and (c) contains a bathroom or powder room which complies with Requirements 7. (Note: multistory dwelling units in non-elevator buildings are not covered dwelling units because, in such cases, there is no ground floor unit.)

4. Except as provided in paragraphs (5) and (6) below, thresholds at exterior doors, including sliding door tracks, are no higher than 3/4 inch. Thresholds and changes in level at these locations are beveled with a slope no greater than 1:2.

5. Exterior deck, patio, or balcony surfaces are no more than 1/2 inch below the floor level of the interior of the dwelling units, unless they are constructed of impervious material such as concrete, brick or flagstone. In such case, the surface is no more than 4 inches below the floor level of the interior of the dwelling unit, or lower if required by local building code.

6. At the primary entry door to dwelling units with direct exterior access, outside landing surfaces constructed of impervious materials such as concrete, brick or flagstone, are no more than 1/2 inch below the floor level of the interior of the dwelling unit. The finished surface of this area that is located immediately outside the entry may be area that is located immediately outside the entry may be sloped, up to 1/8 per foot (12 inches), for drainage.

Requirement 5 Light Switches, Electrical Outlets, Thermostats and Other Environment Controls in Accessible Locations.

The operable parts of light switches, electrical outlets, thermostats and other environmental controls shall be located no higher than 48 inches, and no lower than 15 inches, above the floor. If the reach is over an obstruction (for example, an overhanging shelf) between 20 and 25 inches in depth, the maximum height is reduced to 44 inches for forward approach; or 46 inches for side approach, provided the obstruction (for example, a kitchen base cabinet) is no more than 24 inches in depth. Obstructions should not extend more than 25 inches form the wall beneath a control. [Figure # 3]

Note: Circuit breakers, appliance controls and outlets dedicated to specific appliances are not covered by FHA.

Requirement 6 Reinforced Walls for Grab Bars.

Provide reinforced bathroom walls to allow later installation of grab bars around the toilet, tub, shower stall and shower seat, where such facilities are provided. [Figure # 4]. Where the toilet is not placed adjacent to a side wall, the bathroom would comply if provision was made for installation of floor mounted, foldaway or similar alternative grab bars.

Powder rooms (a room with a toilet and sink) are not required to have grab bar reinforcing unless the powder room is the only toilet facility located on an accessible level of a multistory dwelling unit.

Note: Installation of bathtubs is not limited by [figure # 4], a tub may have shelves or benches at either end, or a tub may be installed without surrounding walls, if there is provision for alternative mounting of grab bars. For example, a sunken tub placed away from walls could have reinforced areas for installation of floor-mounted grab bars. The same principle applies to shower stalls – e.g., glass-walled stalls could be planned to allow floor-mounted grab bars to be installed later.

See architectural drawings for reinforcing at special conditions.

Reinforcement for grab bars may be provided in a variety of ways (for example, by plywood or wood blocking) so long as the necessary reinforcement is placed so as to permit later installation of appropriate grab bars.

Requirement 7 Usable kitchens and bathrooms.

1. Usable kitchens shall provide the following:

   (a) A clear floor space at least 30 inches by 48 inches that allows a centered parallel approach by a person in a wheel chair is provided at the range or cooktop and sink, and either a parallel or forward approach is provided at oven, dishwasher, refrigerator/freezer of trash compactor.

   (b) Clearance between counters and all opposing base cabinets, countertops, appliances or walls is at least 40 inches.

   (c) In U-shaped kitchens with sink or range or cooktop at the base of the "U", a 60-inch turning radius is provided to allow centered parallel approach, or base cabinets are removable at that location to allow knee space for a forward approach.

2. Usable bathrooms shall provide the following:

   All bathrooms in the dwelling unit comply with the provisions of paragraph (a); or

   At least one bathroom in the dwelling unit complies with the provisions of paragraph (b), and all other bathrooms and powder rooms within the dwelling unit must be on an accessible route with usable entry doors in accordance with the guidelines for Requirements 3 and 4.

   However, in multistory dwelling units, only those bathrooms on the accessible level are subject to the requirements of the act. Where a powder room is the only facility provided on the accessible level of a multistory dwelling unit, the powder room must comply with provisions of paragraph (a) or paragraph (b). Powder rooms that are subject to the requirements of the act must have reinforcements for grab bars as provided in the guideline for Requirement 6.

   See architectural drawings for designation of type bathroom provided.

(a) Bathrooms that have reinforced walls for grab bars (see Requirement 6) would meet the act if:

   (i) Sufficient maneuvering space is provided within the bathroom for a person using a wheelchair or other mobility aid to enter and close the door, use the fixtures, reopen the door and exit. Doors may swing into the clear floor space provided at any fixture if the maneuvering space is provided. Maneuvering spaces may include any kneespace or toespace available below bathroom fixtures.

   (ii) Clear floor space is provided at fixtures as shown in [Fig. # 5]. Clear floor space at fixtures may overlap.

   (iii) If the shower stall is the only bathing facility provided in the covered dwelling unit, the shower stall measures at least 36 inches x 36 inches.

   Note:
   Cabinets under lavatories are acceptable provided the bathroom has space to allow a parallel approach by a person in a wheelchair; if parallel approach is not possible within the space, any cabinets provided would have to be removable to afford the necessary knee clearance for forward approach.

(b) Bathrooms that have reinforced walls for grab bars (see Requirement 6) would meet the act if:

   (i) Where the door swings into the bathroom, there is a clear space (approximately, 2'6" by 4'0") within the room to position a wheelchair or other mobility aid clear of the path of the door as it is closed and to permit use of fixtures. This clear space can include any kneespace and toespace available below bathroom fixtures.

   (ii) Where the door swings out, a clear space is provided within the bathroom for a person using a wheelchair or other mobility aid to position the wheelchair such that the person is allowed use of fixtures. There also shall be clear space to allow persons using wheelchairs to reopen the door to exit.

   (iii) When both tub and shower fixtures are provided in the bathroom, at least one is made accessible. When two or more lavatories in a bathroom are provided, at least one is made accessible.

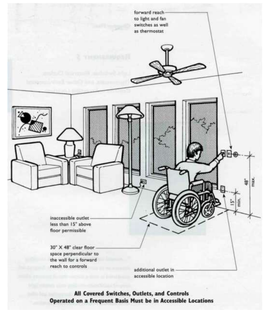
   (iv) Toilets are located within bathrooms in a manner that permit a grab bar to be installed on one side of the fixture. In locations where toilets are adjacent to walls or bathtubs, the center line of the fixture is a minimum of 1'-6" from the obstacle. The other (non grab bar) side of the toilet fixture is a minimum of 1'-3"from the finished surface of adjoining walls, vanities or from the edge of a lavatory. [See Figure # 5(a)].

   (v) Vanities and lavatories are installed with the centerline of the fixture a minimum of 1'-3" horizontally from an adjoining wall or fixture. The top of the fixture rim is a maximum height of 2'-10"above the finished floor. If kneespace is provided below the vanity, the bottom of the apron is at least 2'-3"above the floor. If provided, full kneespace (for front approach) is at least 1'-5"deep. [See Figure # 5(c)].

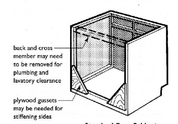
   (vi) Bathtubs and tub/showers located in the bathroom provide a clear access aisle adjacent to the lavatory that is at least 2'-6"wide and extends for a length of 4'-0"measured from the foot of the bathtub). [See Figure # 6.]

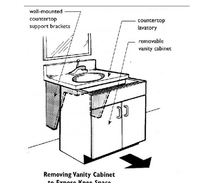
   (vii) Stall showers in the bathroom may be of any size or configuration. A minimum clear floor space 2'-6" wide by 4'-0" should be available outside the stall. [See Figure # 5(d)]. If the shower stall is the only bathing facility provided in the covered dwelling unit, or on the accessible level of a covered multistory unit, and measures a nominal 36x36, the shower stall must have reinforcing to allow for installation of an optional wall hung bench seat.

BASIC COMPONENTS FOR ACCESSIBLE AND USABLE PUBLIC AND COMMON USE AREAS OR FACILITIES		
Accessible element or space	ANSI 2009 A117.1 section	Application
1. Accessible route(s)	4.3	Within the boundary of the site: (a) From public transportation stops, accessible parking spaces, accessible passenger loading zones, and public streets or sidewalks to accessible building entrances (subject to site considerations described in section 5). (b) Connecting accessible buildings, facilities, elements and spaces that are on the same site. On-grade walks or paths between separate buildings with covered multifamily dwellings, while not required, should be accessible unless the slope of finish grade exceeds 8.33% at any point along the route. Handrails are not required on these accessible walks. (c) Connecting accessible building or facility entrances with accessible spaces and elements within the building or facility, including adaptable dwelling units. (d) Where site or legal contents prevent a route accessible to wheelchair users between covered multifamily dwellings and public or common-use facilities elsewhere on the site, an acceptable alternative is the provision of access via a vehicular route so long as there is accessible parking on an accessible route to at least 2% of covered dwelling units, and necessary site provisions such as parking and curb cuts are available at the public or common use facility.
2. Protruding objects	4.4	Accessible routes or maneuvering space including, but not limited to halls, corridors, passageways, or aisles.
3. Ground and floor surface treatments	4.5	Accessible routes, rooms and spaces, including floors, walks, ramps, stairs, and curb ramps.
4. Parking and passenger-loading zones	4.6	If provided at the site, designated accessible parking at the dwelling unit on request of residents with handicaps, on the same terms and with the full range of choices (e.g., surface parking or garage) that are provided for other residents of the project, with accessible parking on a route accessible to wheelchairs for at least 2% of the covered dwelling units; accessible visitor parking sufficient to provide access to grade-level entrances of covered multifamily dwellings; and accessible parking at facilities (e.g., swimming pools) that serve accessible buildings.
5. Curb ramps	4.7	Accessible routes crossing curbs.
6. Ramps	4.8	Accessible routes with slopes greater than 1:20.
7. Stairs	4.9	Stairs on accessible routes connecting levels not connected by an elevator.
8. Elevator	4.10	If provided.
9. Platform lift	4.11	May be used in lieu of an elevator or ramp under certain conditions.
10. Drinking fountains and water coolers	4.15	Fifty percent of fountains and coolers on each floor, or at least one, if provided in the facility or at the site.
11. Toilet rooms and bathing facilities	4.22	Where provided in public-use and common-use facilities, at least one of (including water closets, each fixture provided per room. toilet rooms and stalls, urinals, lavatories and mirrors, bathtubs, shower stalls, and sinks.)
12. Seating, tables, or work surfaces	4.30	If provided in accessible spaces, at least one of each type provided
13. Places of assembly.	4.31	If provided in the facility or at the site.
14. Common-use spaces and Facilities: (incl. swimming pools,playgrounds, entrances, rental offices, lobbies, elevators, mailbox areas, lounges, halls, and corridors, and the like)	4.1 through 4.30	If provided in the facility or at the site: (a) Where multiple recreational facilities (e.g., tennis courts) are provided sufficient accessible facilities of each type to assure equitable opportunity for use by persons with handicaps. (b) Where practical, access to all or a portion of nature trails and jogging paths.
15. Laundry rooms.	4.32.6	If provided in the facility or at the site, at least one of each type of appliance provided in each laundry area, except that laundry rooms serving covered multifamily dwellings would not be required to have front-loading washers in order to meet the requirements of the Fair Housing Act. (Where front loading washers are not provided, management will be expected to provide assertive devices on request if necessary to permit a resident to use a top loading washer.)



SWITCHES, OUTLETS, AND CONTROLS





REMOVABLE CABINET

BATHROOM PLANS AND FIXTURE HEIGHTS - FAIR HOUSING REQUIREMENTS

NOTES:

1. ALL GRAB BARS OR OTHER ACCESSIBILITY ISSUES MUST CONFORM TO FAIR HOUSING REQUIREMENTS. REINFORCING MUST BE PLACED TO FULFILL ANY AND ALL REQUIREMENTS

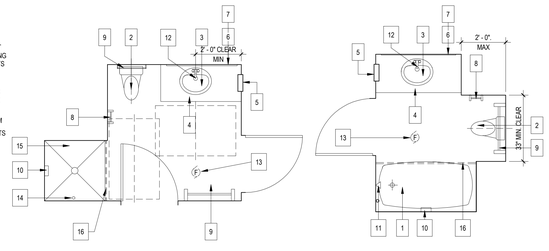
2. AT LEAST ONE TOILET AND BATHING FACILITY IN THE TYPE B DWELLING UNIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOILET AND BATHING FACILITIES REQUIREMENTS OF SECTION 1003.11 (TYPE A) OF THE ICC ANSI 117.1 BCNYS 1107.2.2.

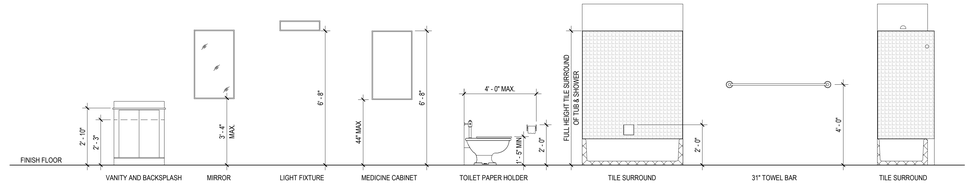
3. NOT ALL SHOWN DIMENSIONS ARE REQUIRED BY FHADM

ALL UNITS TO COMPLY WITH FAIR HOUSING REQUIREMENTS

LEGEND

1	BATHTUB
2	WATER CLOSET
3	COUNTERTOPS & INTEGRAL BOWL
4	CABINETRY
5	MEDICINE CABINET
6	MIRROR
7	STRIP LIGHT - ABOVE
8	TOILET PAPER HOLDER
9	TOWEL HOLDER - BAR
10	SOAP DISH
11	TUB CONTROL
12	LAVATORY FAUCET
13	EXHAUST FAN - ABOVE
14	SHOWER CONTROLS
15	PREFABRICATED SHOWER PAN
16	SHOWER CURTAIN BAR





ARCHITECT:

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P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

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OWNER:

28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

FAIR HOUSING ACT - MOUNTING HEIGHTS AND DESIGN CRITERIA

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKC.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:45:26 AM
FILE NAME:

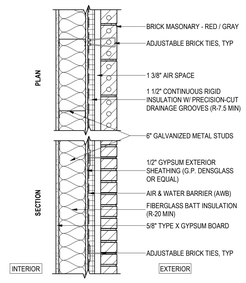
G-022

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EXTERIOR WALL ASSEMBLIES

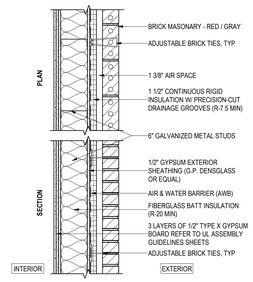
1 HOUR RATED EXTERIOR WALL W/ MASONRY VENEER



1 HOUR RATED WALL
UL DESIGN U423 - BEARING WALL
STC 49 W/INSULATION TEST# USG-810937

SB 01 — 6" METAL STUDS

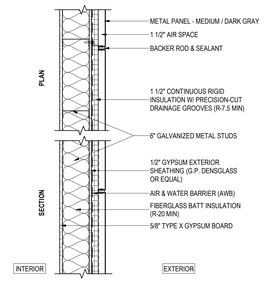
2 HOUR RATED EXTERIOR WALL W/ MASONRY VENEER



1 HOUR RATED WALL
UL DESIGN U423 - BEARING WALL
STC 49 W/INSULATION TEST# USG-810937

SB 65 — 6" METAL STUDS

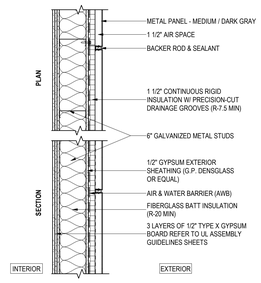
NON-RATED AND 1 HOUR RATED EXTERIOR WALL W/ METAL PANEL



1 HOUR RATED WALL
UL DESIGN U423 - BEARING WALL
STC 49 W/INSULATION TEST# USG-810937

SB 91 — 6" METAL STUDS

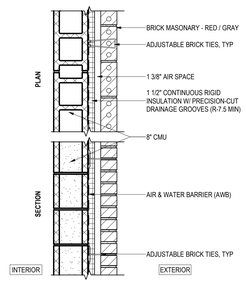
2 HOUR RATED EXTERIOR WALL W/ METAL PANEL



1 HOUR RATED WALL
UL DESIGN U423 - BEARING WALL
STC 49 W/INSULATION TEST# USG-810937

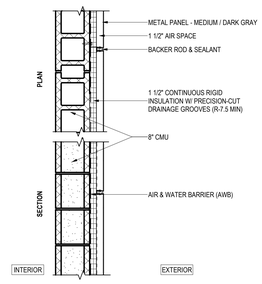
SB 95 — 6" METAL STUDS

2 / 3 HOUR RATED EXTERIOR MASONRY WALL W/ MASONRY VENEER



MO 65 / MO 66 — 8" CMU

2 HOUR RATED EXTERIOR MASONRY WALL W/ METAL PANEL



MO 95 — 8" CMU

FURRING CHANNEL

FO 01 — 7/8" METAL FURRING CHANNEL

TYPICAL FURRING PARTITION

SO 10 / SB 10 / SS 10 — 1 5/8" METAL STUD
SO 20 / SB 20 / SS 20 — 2 1/2" METAL STUD
SO 30 / SB 30 / SS 30 — 3 5/8" METAL STUD
SO 50 / SB 50 / SS 50 — 6" METAL STUD

TYPICAL INTERIOR NON BEARING WALL

SO 21 / SB 21 / SS 21 — 2 1/2" METAL STUD
SO 31 / SB 31 / SS 31 — 3 5/8" METAL STUD
SO 51 / SB 51 / SS 51 — 6" METAL STUD
W/ INSULATION STC-44 - SIM TO TEST # NRC 66, 1968

1 HOUR RATED INTERIOR WALL

1 HOUR RATED WALL
UL DESIGN U 419 - NON LOAD BEARING
UL DESIGN U 423 - BEARING WALL
STC 40 W/O INSULATION TEST# USG-860808
STC 49 W/INSULATION TEST# SA-870-717

SO 32 / SB 32 / SS 32 — 3 5/8" METAL STUD
SO 52 / SB 52 / SS 52 — 6" METAL STUD

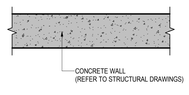
2 HOURS RATED INTERIOR WALL

2 HOUR RATED WALL
UL DESIGN U 419 - NON LOAD BEARING
STC 53 W/ INSULATION TEST# RAL-TL-11-176

UL DESIGN U 423 - BEARING WALL
STC 51 W/O INSULATION TEST# USG-810061
STC 61 W/ INSULATION TEST# USG-810937

SO 33 / SB 33 / SS 33 — 3 5/8" METAL STUD
SO 53 / SB 53 / SS 53 — 6" METAL STUD

CONCRETE WALL



TYPICAL 721.2.1.1 (2018 IBC)
MINIMUM EQUIVALENT THICKNESS OF CAST-IN-PLACE OR PRECAST CONCRETE WALLS, LOAD-BEARING OR NONLOAD-BEARING

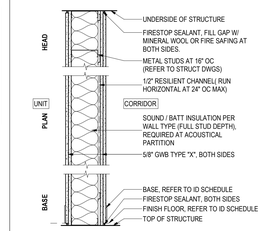
CONCRETE TYPE	MINIMUM SLAB THICKNESS (INCHES) FOR FIRE RESISTANCE RATING OF				
	1-HOUR	1 1/2-HOUR	2-HOUR	3-HOUR	4-HOUR
SILICEOUS	3.5	4.3	5.0	6.2	7.0
CARBONATE	3.2	4.0	4.6	5.7	6.6
SAND-LIGHTWEIGHT	2.7	3.3	3.8	4.6	5.4
LIGHTWEIGHT	2.5	3.1	3.6	4.4	5.1

FOR SI: 1 INCH = 25.4mm

CONCRETE WALL

CO 01 — 1 HR RATED AS PER IBC 2018 TABLE 721.2.1.1
CO 02 — 2 HR RATED AS PER IBC 2018 TABLE 721.2.1.1
CO 03 — 3 HR RATED AS PER IBC 2018 TABLE 721.2.1.1
CO 04 — 3 HR RATED AS PER IBC 2018 TABLE 721.2.1.1

1 HOUR RATED WALL BETWEEN UNIT AND CORRIDOR

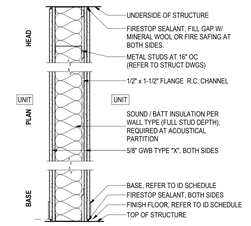


2 HOUR RATED WALL
UL DESIGN U 419 - NONBEARING
STC 54 W/ INSULATION TEST# RAL-TL-83-216

UL DESIGN U 423 - BEARING WALL
STC 50 W/ INSULATION TEST# SA-830628

SS 34 — 3 5/8" METAL STUD
SS 56 — 6" METAL STUD

1 HOUR RATED UNIT DEMISING WALL

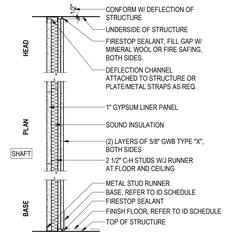


2 HOUR RATED WALL
UL DESIGN U 419 - NONBEARING
STC 54 W/ INSULATION TEST# RAL-TL-83-216

UL DESIGN U 423 - BEARING WALL
STC 50 W/ INSULATION TEST# SA-830628

SS 57 — 6" METAL STUD

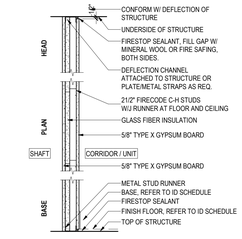
TYPICAL VERTICAL SHAFT PARTITION



2 HOUR RATED SHAFT WALL
UL DESIGN - U438

SO 02 — W/O INSULATION STC 38 - TEST # USG - 040917
SS 02 — W/ INSULATION GA FILE WP - 7117 STC 44 - TEST # USG-040911 BASED ON 4" C-H STUDS 25 GAUGE

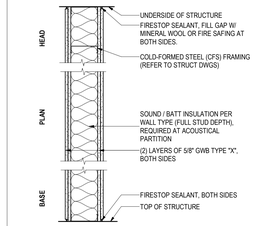
TYPICAL VERTICAL SHAFT PARTITION



2 HOUR RATED SHAFT WALL
UL DESIGN - U467
GA FILE WP - 7117
STC 44 W/O INSULATION, TEST # USG-040911
BASED ON 4" C-H STUDS

SO 03 — W/ INSULATION GA FILE WP - 7117 STC 44 - TEST # USG-040911 BASED ON 4" C-H STUDS 25 GAUGE

2 HOURS RATED STAIR & ELEVATOR SHAFT WALL



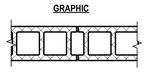
2 HOUR RATED WALL
UL DESIGN U 419 - NON LOAD BEARING
STC 53 W/ INSULATION TEST# RAL-TL-11-176

UL DESIGN U 423 - BEARING WALL
STC 51 W/O INSULATION TEST# USG-810061
STC 61 W/ INSULATION TEST# USG-810937

SS 58 — 6" METAL STUD

CMU WALL ASSEMBLIES

GRAPHIC



CONCRETE MASONRY UNITS FINISH AS SCHEDULED

2 HOUR / 3 HOUR RATED WALL
UL DESIGN U905

	4" CONC MASONRY UNITS 3 5/8" X 7 5/8" X 7 5/8" OR 3 5/8"X7 5/8" X 15 5/8" KAL 359-1-66, 1966	6" CONC MASONRY UNITS 5 5/8" X 7 5/8" X 7 5/8" OR 5 5/8" X 7 5/8" X 15 5/8"	8" CONC MASONRY UNITS 7 5/8" X 7 5/8" X 7 5/8" OR 7 5/8" X 7 5/8" X 15 5/8" STC 45-55	10" CONC MASONRY UNITS 9 5/8" X 7 5/8" X 7 5/8" OR 9 5/8" X 7 5/8" X 15 5/8" STC 50 TO 60	12" CONC MASONRY UNITS 11 5/8" X 7 5/8" X 7 5/8" OR 11 5/8" X 7 5/8" X 15 5/8"
NON RATED WALL	MO 01	MO 02	MO 03	MO 04	MO 05
1 HOUR RATED WALL	MO 06	MO 07	MO 08	MO 09	MO 10
2 HOUR RATED WALL UL DESIGN U905	MO 11 STC 35 - TEST # KAL 359-2-66, 1966	MO 12	MO 13	MO 14	MO 15
3 HOUR RATED WALL UL DESIGN U904	MO 16	MO 17	MO 18	MO 19	MO 20

TABLE 722.3.2 (2018 IBC AS ADOPTED BY 2020 BCNYS)

MINIMUM EQUIVALENT THICKNESS (inches) OF BEARING OR NON-BEARING CONCRETE MASONRY WALLS

TYPE OF AGGREGATE	FIRE-RESISTANCE RATING (Hours)												
	½	¾	1	1 ⅓	1 ½	1 ⅔	2	2 ⅓	2 ½	2 ⅔	3	3 ⅓	3 ½	3 ⅔	4
PUMICE OR EXPANDED SLAG	1.5	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.7
EXPANDED SHALE, CLAY OR SLATE	1.8	2.2	2.6	2.9	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1
LIMESTONE, CINDERS OR UNEXPANDED SLAG	1.9	2.3	2.7	3.	3.4	3.7	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9
CALCAREOUS OR SILICEOUS GRAVEL	2.0	2.4	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.2

FOR SI: 1 INCH = 25.4mm

a. Values between those shown in the table can be determined by direct interpolation.

b. Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown in the table.

c. Requirements of ASTM C 55, ASTM C 73, ASTM C 90 or ASTM C 744 shall apply.

d. Minimum required equivalent thickness corresponding to the hourly fire-resistance rating for units with a combination of aggregate shall be determined by linear interpolation based on the percent by volume of each aggregate used in manufacture.

GENERAL NOTE

A. GENERAL CONTRACTOR NOTE:

1. ALL WALLS SHOWN ON U.L. ASSEMBLIES SHALL BE FACED GA+GYPSUM BOARD ASSOCIATION 5/8" TYPE "X" GYPSUM BOARD OR APPROVE OTHERWISE BY THE UL ASSEMBLIES, GA FILES ASSEMBLIES.

B. EXTERIOR WALL PARTITION STUDS & PLATES:

1. CONSULT WITH VENEER MANUFACTURE LATEST PRODUCT INFORMATION FOR ANY ADDITIONAL WALL REQUIREMENTS.

C. INTERIOR NON-RATED WALL PARTITION STUDS:

1. INTERIOR PARTITION STUDS SPACED AT MAXIMUM OF 16" ON CENTER (O.C.)

D. FIRE RATED WALLS:

1. FIRE RESISTANCE DIRECTORY TO BE BY UNDERWRITERS LABORATORIES, INC., GA FILES ASSEMBLIES AND / OR IBC SECTION 720 PERSCRIPTIVE FIRE RESISTANCE AND / OR IBC SECTION 721 CALCULATED FIRE RESISTANCE.

2. WHEN NON-RATED FIRE WALLS INTERSECT FIRE RATED WALLS; CARRY CONSTRUCTION OF RATED WALLS THROUGH.

3. IF RATED WALL OCCURS BEHIND PLUMBING INSTALLATION, INSTALL GYPSUM BOARD BEFORE FIXTURES.

4. EXTEND FIRE RATED PARTITIONS FROM FLOOR SLAB TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE AND COVER W/ TYPE 'X' GYP BOARD FULL HEIGHT. SEAL AT BOTTOM AND TOP.

5. PROVIDE FIRE STOPPING AT PENETRATION OF FIRE RATED WALLS. CUTOUTS FOR ELECTRICAL OUTLETS ON OPPOSITE SIDES OF FIRE RATED WALLS IN SAME STUD SPACE IS NOT ALLOWED.

E. SOUND INSULATED WALLS:

1. FIRE RESISTANCE SOUND CONTROL DESIGN MANUAL TO BE BY GYPSUM ASSOCIATIONS.

2. PROVIDE CONTINUOUS 3 1/2" SOUND INSULATION IN STUD WALLS ENCLOSING MECHANICAL ROOMS.

3. PROVIDE CONTINUOUS FULL CAVITY INSULATION IN TENANT SEPARATION WALLS.

4. PROVIDE CONTINUOUS FULL CAVITY SOUND INSULATION IN WALLS SEPARATING UNITS FROM COMMON AREAS.

5. STAGGER CUTOUTS FOR ELECTRICAL SWITCHES AND OUTLETS TO ALLOW SOUND INSULATION TO PASS AROUND BOXES AT INSULATED WALLS.

6. GYPSUM ASSOCIATION FIRE RESISTANT & SOUND CONTROL DESIGN MANUAL.

F. BLOCKING:

1. PROVIDE SOLID WOOD BLOCKING (FRT REQUIRED FOR NON-COMBUSTIBLE CONSTRUCTION) OR METAL STRAPPING IN AREAS BEHIND GYPSUM BOARD (IN STUD WALLS) FOR ATTACHMENT OF BATHROOM ACCESSORIES, STAIR RAILINGS, SPECIALTRIM DETAILS, WALL CABINETS AND OTHER WALL MOUNTED ITEMS.

2. PROVIDE BLOCKING FOR FUTURE INSTALLATION OF GRAB BARS AT ALL UNIT BATHROOM PER FAIR HOUSING.

KEY LEGEND

WALL ASSEMBLY

XXX (YY)

1ST LETTER INDICATES STRUCTURAL MATERIAL

W WOOD STUD
S METAL STUD
M MASONRY UNIT (CMU)
C CONCRETE
F FURRING PARTITION

2ND LETTER INDICATES INSULATION

O NO INSULATION
B BATT INSULATION
S SOUND INSULATION

CORNER SHADING INDICATES FIRE RATING

0 CORNER_____ 0 HOUR — XX / XX
1 CORNER_____ 1 HOUR — XX / XX
2 CORNER_____ 2 HOUR — XX / XX
3 CORNER_____ 3 HOUR — XX / XX

FLOOR ASSEMBLY

FCA 25

NAMING CONVENTION

FCA FLOOR CEILING ASSEMBLY
BCA BALCONY CEILING ASSEMBLY
RCA ROOF CEILING ASSEMBLY
CA CEILING ASSEMBLY

CORNER SHADING INDICATES FIRE RATING

1 CORNER_____ 1 HOUR — XXX XX
2 CORNER_____ 2 HOUR — XXX XX
3 CORNER_____ 3 HOUR — XXX XX

NUMBER INDICATES VARIATIONS

W	20-49	1 1/2" (2 X 4)	WOOD STUD
	50-59	5 1/2" (2 X 6)	WOOD STUD
	60-69	BRICK VENEER	WOOD STUD
	70-79	STONE VENEER	WOOD STUD
	80-89	CEMENTITIOUS PANEL/SIDING	WOOD STUD
	90-99	METAL PANEL	WOOD STUD
	100-109	STUCCO	WOOD STUD
	110-119	ARCH. MASONRY BLOCKS	WOOD STUD
	120-129	EIFS	WOOD STUD
	130-139	CMU/CONC. VENEER	WOOD STUD
	140-149	CULTURED STONE	WOOD STUD
M	00-59		MASONRY WALL
	60-69	BRICK VENEER	MASONRY WALL
	70-79	STONE VENEER	MASONRY WALL
	80-89	CEMENTITIOUS PANEL/SIDING	MASONRY WALL
	90-99	METAL PANEL	MASONRY WALL
	100-109	STUCCO	MASONRY WALL
	110-119	ARCH. MASONRY BLOCKS	MASONRY WALL
	120-129	EIFS	MASONRY WALL
	130-139	_____	MASONRY WALL
	140-149	CULTURED STONE	
		MASONRY WALL	
	150-169	FIRE WALL	MASONRY WALL
	170-179	BOTH SIDE MASONRY	MASONRY WALL
S	10-19	1 5/8"	METAL STUD
	20-29	2 1/2"	METAL STUD
	30-39	3 5/8"	METAL STUD
	50-59	6"	METAL STUD
	60-69	BRICK VENEER	METAL STUD
	70-79	STONE VENEER	METAL STUD
	80-89	CEMENTITIOUS PANEL/SIDING	METAL STUD
	90-99	METAL PANEL	METAL STUD
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	60-69	BRICK	CONCRETE WALL
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	130-139	CMU BLOCKS	CONCRETE WALL
	140-149	CULTURED STONE	CONCRETE WALL
	150-169	FIRE WALL	CONCRETE WALL
	170-179	BOTH SIDE MASONRY	CONCRETE WALL

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OWNER:
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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

TYPICAL WALL ASSEMBLIES

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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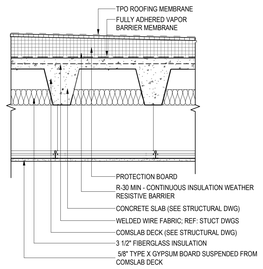
G-030

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INTERIOR WALL ASSEMBLIES

CEILING ASSEMBLY

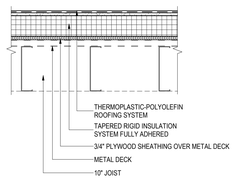
1 HOUR ROOF CEILING ASSEMBLY



UL DESIGN - D989 - 1 HOURS RATED ASSEMBLY

RCA 10

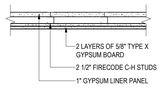
ROOF FLOOR ASSEMBLY



RCA 12

FLOOR/CEILING ASSEMBLY

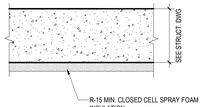
2 HOUR RATED TYPICAL CEILING ASSEMBLY



2 HOUR RATED ROOF / CEILING ASSEMBLY
UL DESIGN U417, FIRE TEST WHI 651-0306.4

CA 10

3 HOUR CONCRETE SLAB



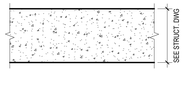
CONCRETE SLAB FLOOR (FOR THICKNESS REFER TO STRUCT DRAWINGS)

NOTE: A) PROVIDE MOISTURE RESISTANT GYP BD OR CEILING TIES AT GARAGE OR AREAS EXPOSED TO EXTERIOR AIR.
B) R-30 BATT AND ACT (HEATED PLENUM)
C) SEALED CONCRETE FOR EXPOSED CONCRETE SURFACE.

3 HOUR RATED AS PER (2018 IBC AS ADOPTED BY 2020 BCNYS)
TABLE 720.2.2.1

FCA 10

2 HOUR CONCRETE SLAB



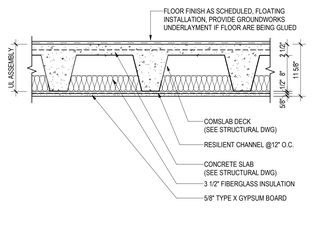
CONCRETE SLAB FLOOR (FOR THICKNESS REFER TO STRUCT DRAWINGS)

USE SEALED CONCRETE FOR EXPOSED CONCRETE SURFACE.

2 HOUR RATED AS PER (2018 IBC AS ADOPTED BY 2020 BCNYS)
TABLE 720.2.2.1

FCA 12

COMSLAB FLOOR ASSEMBLY



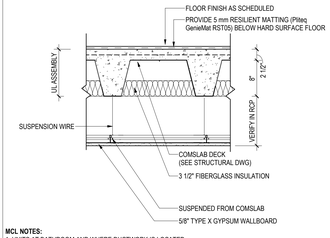
MCL NOTES: COMPLIES WITH IBC (STC 50). TYPICAL IN LR AND BR IN UNITS AND WHERE WE DONT' HAVE DUCTWORK.

STC 54 NGC#5010116_R1
IIC 24 NGC#7010130_R1

UL DESIGN - D904 - 2 HOUR RATED ASSEMBLY

FCA 16

COMSLAB FLOOR ASSEMBLY



MCL NOTES:
1. UNITS AT BATHROOM AND WHERE DUCTWORK IS LOCATED
2. CONFIRM ID CONDITIONS.

STC 55 NGC#5010127_R1
IIC 24 NGC#7010171_R1

UL DESIGN - D904 - 2 HOUR RATED ASSEMBLY

FCA 17

SLAB ON GRADE ASSEMBLY

SLAB ON GRADE

* ADD R10 MIN RIGID INSULATION AT BUILDING PERIMETER AND EXTEND IT 2'-0" HORIZONTALLY AND VERTICALLY AT CONDITIONED SPACES ONLY

5" CONCRETE SLAB

SSA 01

GENERAL NOTE

A. GENERAL CONTRACTOR NOTE:

1. ALL WALLS SHOWN ON U.L. ASSEMBLIES SHALL BE FACED GA+GYPSUM BOARD ASSOCIATION 5/8" TYPE "X" GYPSUM BOARD OR APPROVE OTHERWISE BY THE UL ASSEMBLIES, GA FILES ASSEMBLIES.

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1. CONSULT WITH VENEER MANUFACTURE LATEST PRODUCT INFORMATION FOR ANY ADDITIONAL WALL REQUIREMENTS.

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1. INTERIOR PARTITION STUDS SPACED AT MAXIMUM OF 16" ON CENTER (O.C.)

D. FIRE RATED WALLS:

1. FIRE RESISTANCE DIRECTORY TO BE BY UNDERWRITERS LABORATORIES, INC., GA FILES ASSEMBLIES AND / OR IBC_SECTION 720 PERSCRIPTIVE FIRE RESISTANCE AND / OR IBC SECTION 721 CALCULATED FIRE RESISTANCE.

2. WHEN NON-RATED FIRE WALLS INTERSECT FIRE RATED WALLS; CARRY CONSTRUCTION OF RATED WALLS THROUGH.

3. IF RATED WALL OCCURS BEHIND PLUMBING INSTALLATION, INSTALL GYPSUM BOARD BEFORE FIXTURES.

4. EXTEND FIRE RATED PARTITIONS FROM FLOOR SLAB TO UNDERSIDE OF FLOOR OR ROOF DECK ABOVE AND COVER W/ TYPE 'X' GYP BOARD FULL HEIGHT. SEAL AT BOTTOM AND TOP.

5. PROVIDE FIRE STOPPING AT PENETRATION OF FIRE RATED WALLS. CUTOUTS FOR ELECTRICAL OUTLETS ON OPPOSITE SIDES OF FIRE RATED WALLS IN SAME STUD SPACE IS NOT ALLOWED.

E. SOUND INSULATED WALLS:

1. FIRE RESISTANCE SOUND CONTROL DESIGN MANUAL TO BE BY GYPSUM ASSOCIATIONS.

2. PROVIDE CONTINUOUS 3 1/2" SOUND INSULATION IN STUD WALLS ENCLOSING MECHANICAL ROOMS.

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2. PROVIDE BLOCKING FOR FUTURE INSTALLATION OF GRAB BARS AT ALL UNIT BATHROOM PER FAIR HOUSING.

KEY LEGEND

WALL ASSEMBLY

XXX XX

1ST LETTER INDICATES STRUCTURAL MATERIAL

W	WOOD STUD
S	METAL STUD
M	MASONRY UNIT (CMU)
C	CONCRETE
F	FURRING PARTITION

2ND LETTER INDICATES INSULATION

O	NO INSULATION
B	BATT INSULATION
S	SOUND INSULATION

CORNER SHADING INDICATES FIRE RATING

0	CORNER_____	0 HOUR XX / XX
1	CORNER_____	1 HOUR XX / XX
2	CORNER_____	2 HOUR XX / XX
3	CORNER_____	3 HOUR XX / XX

FLOOR ASSEMBLY

FCA 20

NAMING CONVENTION

FCA	FLOOR CEILING ASSEMBLY
BCA	BALCONY CEILING ASSEMBLY
RCA	ROOF CEILING ASSEMBLY
CA	CEILING ASSEMBLY

CORNER SHADING INDICATES FIRE RATING

1	CORNER_____	1 HOUR XXX XX
2	CORNER_____	2 HOUR XXX XX
3	CORNER_____	3 HOUR XXX XX

NUMBER INDICATES VARIATIONS

W	20-49	1 1/2" (2 X 4)	WOOD STUD
	50-59	5 1/2" (2 X 6)	WOOD STUD
	60-69	BRICK VENEER	WOOD STUD
	70-79	STONE VENEER	WOOD STUD
	80-89	CEMENTITIOUS PANEL/SIDING	WOOD STUD
	90-99	METAL PANEL	WOOD STUD
	100-109	STUCCO	WOOD STUD
	110-119	ARCH. MASONRY BLOCKS	WOOD STUD
	120-129	EIFS	WOOD STUD
	130-139	CMU/CONC. VENEER	WOOD STUD
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M	00-59		MASONRY WALL
	60-69	BRICK VENEER	MASONRY WALL
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	80-89	CEMENTITIOUS PANEL/SIDING	MASONRY WALL
	90-99	METAL PANEL	MASONRY WALL
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	120-129	EIFS	MASONRY WALL
	130-139	_____	MASONRY WALL
	140-149	CULTURED STONE	
	MASONRY WALL		
	150-169	FIRE WALL	MASONRY WALL
	170-179	BOTH SIDE MASONRY	MASONRY WALL
S	10-19	1 5/8"	METAL STUD
	20-29	2 1/2"	METAL STUD
	30-39	3 5/8"	METAL STUD
	50-59	6"	METAL STUD
	60-69	BRICK VENEER	METAL STUD
	70-79	STONE VENEER	METAL STUD
	80-89	CEMENTITIOUS PANEL/SIDING	METAL STUD
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C	00-59		CONCRETE WALL
	60-69	BRICK	CONCRETE WALL
	70-79	STONE	CONCRETE WALL
	110-119	ARCH. MASONRY BLOCKS	CONCRETE WALL
	130-139	CMU BLOCKS	CONCRETE WALL
	140-149	CULTURED STONE	CONCRETE WALL
	150-169	FIRE WALL	CONCRETE WALL
	170-179	BOTH SIDE MASONRY	CONCRETE WALL

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OWNER:

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

TYPICAL FLOOR / ROOF ASSEMBLIES

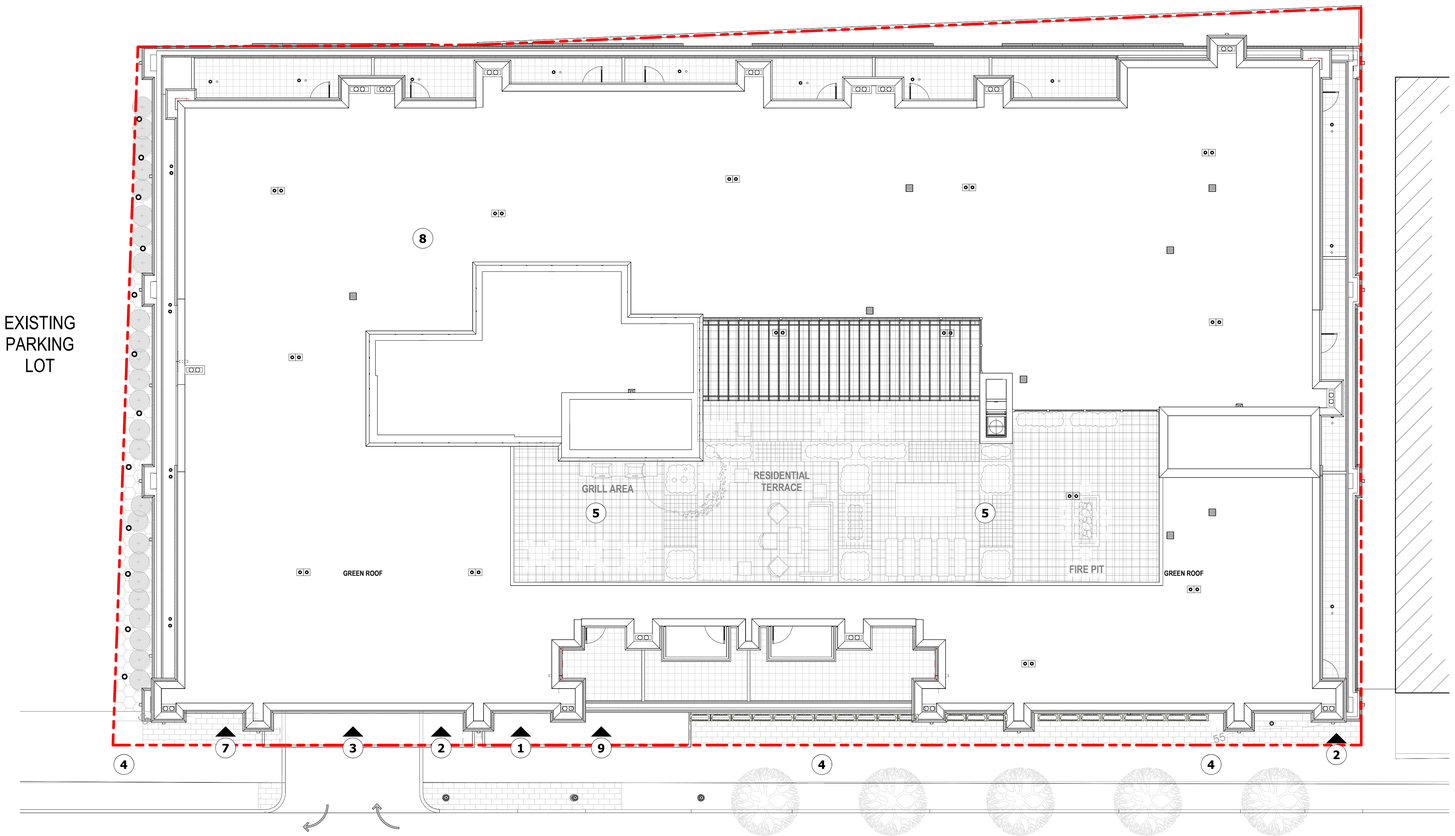
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PLOT DATE: 2/7/2025 9:45:28 AM
FILE NAME:

G-031

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1 A-001 SITE PLAN
Scale: 1/8" = 1'-0"

SITE PLAN KEY NOTES

1. RESIDENTIAL LOBBY ENTRANCE
2. PEDESTRIAN ENTRANCE / EXIT
3. GARAGE VEHICULAR ENTRANCE / EXIT
4. REFER TO LANDSCAPE AND CIVIL DRAWINGS FOR PLANTERS, SIDEWALKS, CONCRETE STEPS, BENCHES AT REAR AND ALONG ALLEY.
5. REFER TO LANDSCAPE FOR ROOF TOP ACTIVITY AREA
6. FIRE HYDRANT AND GATE VALVE
7. TRANSFORMER ROOM
8. GENERATOR (ROOF TOP)
9. FCC

ARCHITECT:
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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

ARCHITECTURAL SITE PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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A-001

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1 A-101 CELLAR 1 FLOOR PLAN
Scale: 1/8" = 1'-0"

2 A-101 CELLAR 2 FLOOR PLAN
Scale: 1/8" = 1'-0"

Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St(SAC001A - ARCH - 28 Pearl Street.rvt

PARKING NOTES

1. THE PARKING AREAS OF ALL BUILDINGS AND FACILITIES, INCLUDING THE BUILDINGS AND FACILITIES OF STATE AND LOCAL GOVERNMENT, SHALL IDENTIFY EACH ACCESSIBLE PARKING PACE BY A SIGN.
2. IF THE SIGN IN D(1) OF THIS REGULATION IS:
2.A. NOT PLACED FLUSH AGAINST A BUILDING, STRUCTURE, OR OTHER LOCATION THAT DOES NOT OBSTRUCT VEHICLE OR PEDESTRIAN TRAFFIC, IT SHALL BE AT LEAST 7 FEET ABOVE THE GROUND;
2.B. PLACED FLUSH AGAINST A BUILDING STRUCTURE OR OTHER LOCATION THAT DOES NOT OBSTRUCT VEHICLE OR PEDESTRIAN TRAFFIC, IT SHALL BE AT LEAST 6 FEET, AND NOT MORE THAN 10 FEET, ABOVE THE GROUND;

PARKING LEGEND

S	STANDARD PARKING
C	COMPACT PARKING
HC	HANDICAP PARKING
HC VAN	VAN HANDICAP PARKING

KEY NOTES

1. BOLLARD
2. TRENCH DRAIN
3. 72" TALL WOOD SCREEN -REFER TO LANDSCAPE DRAWINGS
4. KNOX BOX -COLOR BLACK
5. TWO-WAY COMMUNICATION BY ELEVATOR MANUFACTURER
6. 42" ALUMINUM GUARDRAIL -REFER TO LANDSCAPE DRAWINGS

LEGEND

FCO	FLOOR CLEAN OUT (SEE PLUMBING DWGS)
FD	FLOOR DRAIN (SEE PLUMBING DWGS)
GD	GARAGE DRAIN (SEE PLUMBING DWGS)
HP	HIGH POINT
LP	LOW POINT
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
FDC	FREE STANDING FIRE DEPARTMENT CONNECTION
DS	DOWNSPOUT
OS	OVERFLOW SCUPPER
EJ	EXPANSION JOINT
FOP	FACE OF METAL PANEL
FOB	FACE OF BRICK
FOD	FACE OF DRYVIT FINISH
FOC	FACE OF CONCRETE
FOS	FACE OF STONE
FEC	FIRE EXTINGUISHER CABINET
TD	TRENCH DRAIN (SEE PLUMBING DWGS)
CG	CORNER GUARD

WALL TYPE LEGEND

- CONCRETE WALL (REFER TO STRUCTURAL DWGS)
- BEARING WALL (REFER TO STRUCTURAL DWGS)
- SHEAR WALL (REFER TO STRUCTURAL DWGS)
- DEMISING WALL

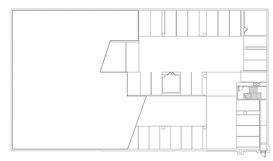
PARKING SCHEDULE - CELLAR 2 FLOOR PLAN

TYPE	SIZE	TOTAL	Level
C	COMPACT - 7'-6" x 16'-0"	7	CELLAR 2
S	STANDARD - 8'-0" x 18'-0"	26	CELLAR 2
		33	

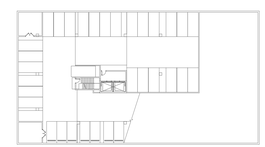
PARKING SCHEDULE - CELLAR 1 FLOOR PLAN

TYPE	SIZE	TOTAL	Level
C	COMPACT - 7'-6" x 16'-0"	19	CELLAR 1
S	STANDARD - 8'-0" x 18'-0"	8	CELLAR 1
		27	

CELLAR 1 - KEYPLAN



CELLAR 2 - KEYPLAN



PROJECT NORTH

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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

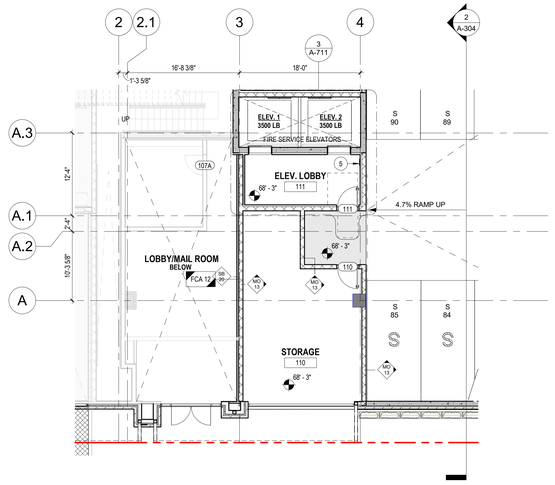
CELLAR 2 & CELLAR 1 FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:54:49 AM
FILE NAME:

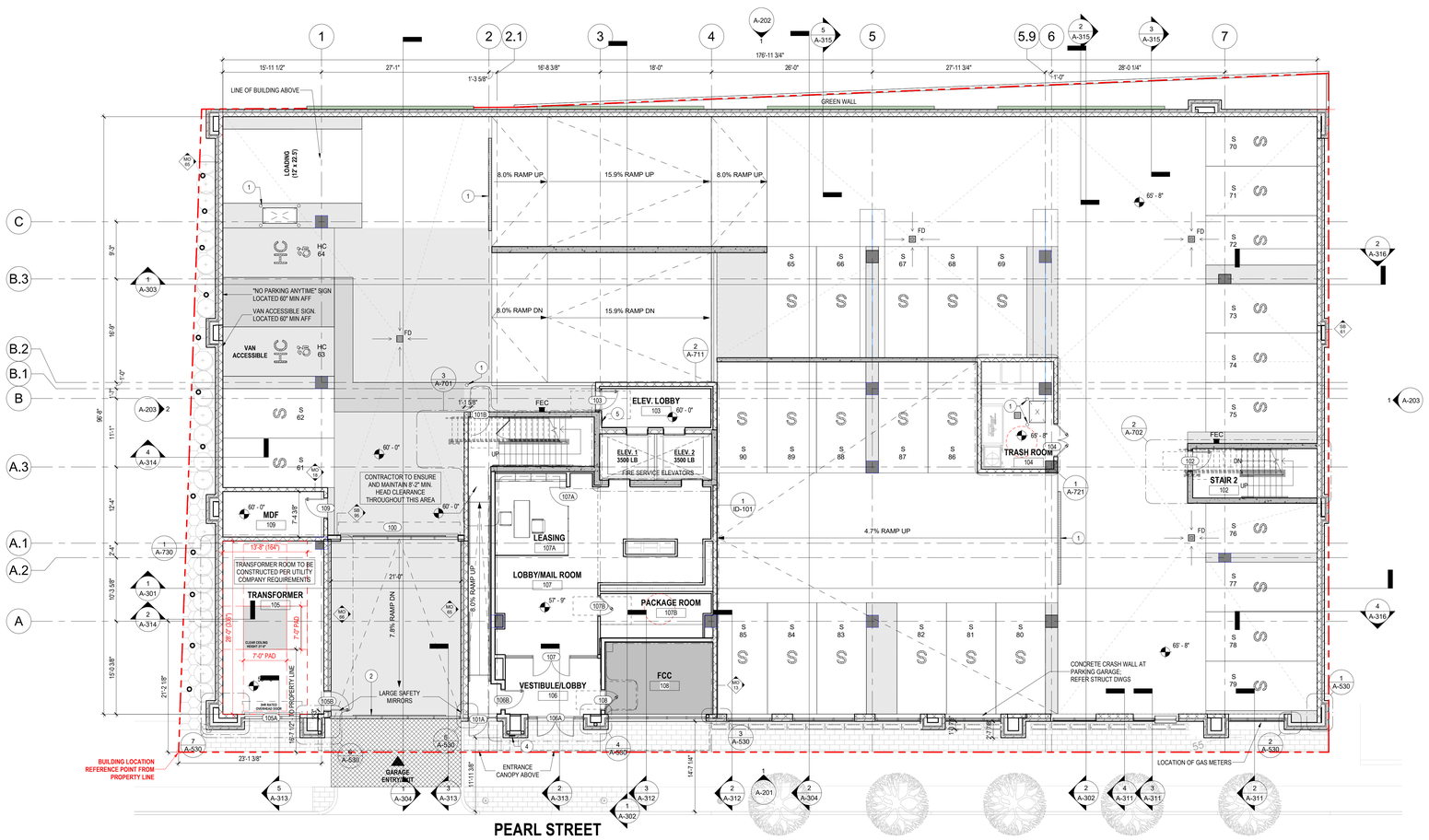
A-101

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2 A-102 FIRST FLOOR UPPER ELEV. LOBBY & STORAGE PLAN

Scale: 1/8" = 1'-0"



1 A-102 FIRST FLOOR PLAN

Scale: 1/8" = 1'-0"

PARKING NOTES

1. THE PARKING AREAS OF ALL BUILDINGS AND FACILITIES, INCLUDING THE BUILDINGS AND FACILITIES OF STATE AND LOCAL GOVERNMENT, SHALL IDENTIFY EACH ACCESSIBLE PARKING PACE BY A SIGN.

2. IF THE SIGN IN D(1) OF THIS REGULATION IS:

2.A. NOT PLACED FLUSH AGAINST A BUILDING, STRUCTURE, OR OTHER LOCATION THAT DOES NOT OBSTRUCT VEHICLE OR PEDESTRIAN TRAFFIC, IT SHALL BE AT LEAST 7 FEET ABOVE THE GROUND;

2.B. PLACED FLUSH AGAINST A BUILDING STRUCTURE OR OTHER LOCATION THAT DOES NOT OBSTRUCT VEHICLE OR PEDESTRIAN TRAFFIC, IT SHALL BE AT LEAST 6 FEET, AND NOT MORE THAN 10 FEET, ABOVE THE GROUND;

PARKING LEGEND

S	STANDARD PARKING
C	COMPACT PARKING
HC	HANDICAP PARKING
HC VAN	VAN HANDICAP PARKING

KEY NOTES

1. BOLLARD
2. TRENCH DRAIN
3. 72" TALL WOOD SCREEN -REFER TO LANDSCAPE DRAWINGS
4. KNOX BOX -COLOR BLACK
5. TWO-WAY COMMUNICATION BY ELEVATOR MANUFACTURER
6. 42" ALUMINUM GUARDRAIL -REFER TO LANDSCAPE DRAWINGS

LEGEND

FCO	FLOOR CLEAN OUT (SEE PLUMBING DWGS)
FD	FLOOR DRAIN (SEE PLUMBING DWGS)
GD	GARAGE DRAIN (SEE PLUMBING DWGS)
HP	HIGH POINT
LP	LOW POINT
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
FDC	FREE STANDING FIRE DEPARTMENT CONNECTION
DS	DOWNSPOUT
OS	OVERFLOW SCUPPER
EJ	EXPANSION JOINT
FOP	FACE OF METAL PANEL
FOB	FACE OF BRICK
FOD	FACE OF DRYVIT FINISH
FOC	FACE OF CONCRETE
FOS	FACE OF STONE
FEC	FIRE EXTINGUISHER CABINET
TD	TRENCH DRAIN (SEE PLUMBING DWGS)
CG	CORNER GUARD

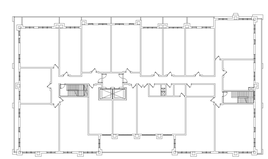
WALL TYPE LEGEND

- CONCRETE WALL (REFER TO STRUCTURAL DWGS)
- BEARING WALL (REFER TO STRUCTURAL DWGS)
- SHEAR WALL (REFER TO STRUCTURAL DWGS)
- DEMISING WALL

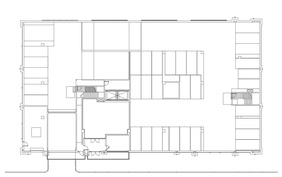
PARKING SCHEDULE - FIRST FLOOR PLAN

TYPE	SIZE	TOTAL	Level
HC	HC -8'-0" x 18'-0"	2	1ST FLOOR
S	STANDARD - 8'-0" x 18'-0"	28	1ST FLOOR
		30	

2ND FLOOR - KEYPLAN



FIRST FLOOR - KEYPLAN



PROJECT NORTH

ARCHITECT:
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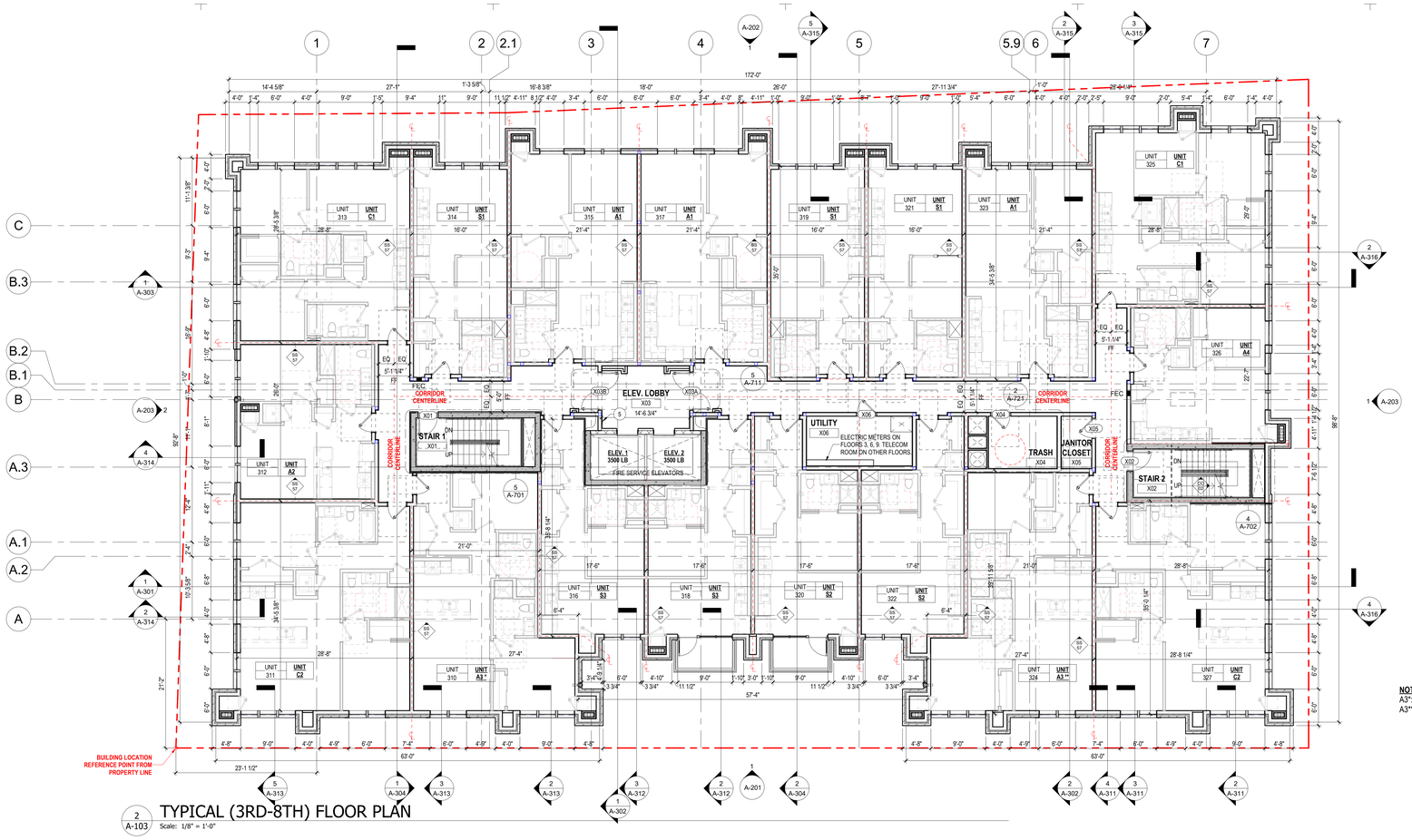
FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:54:52 AM
FILE NAME:

A-102

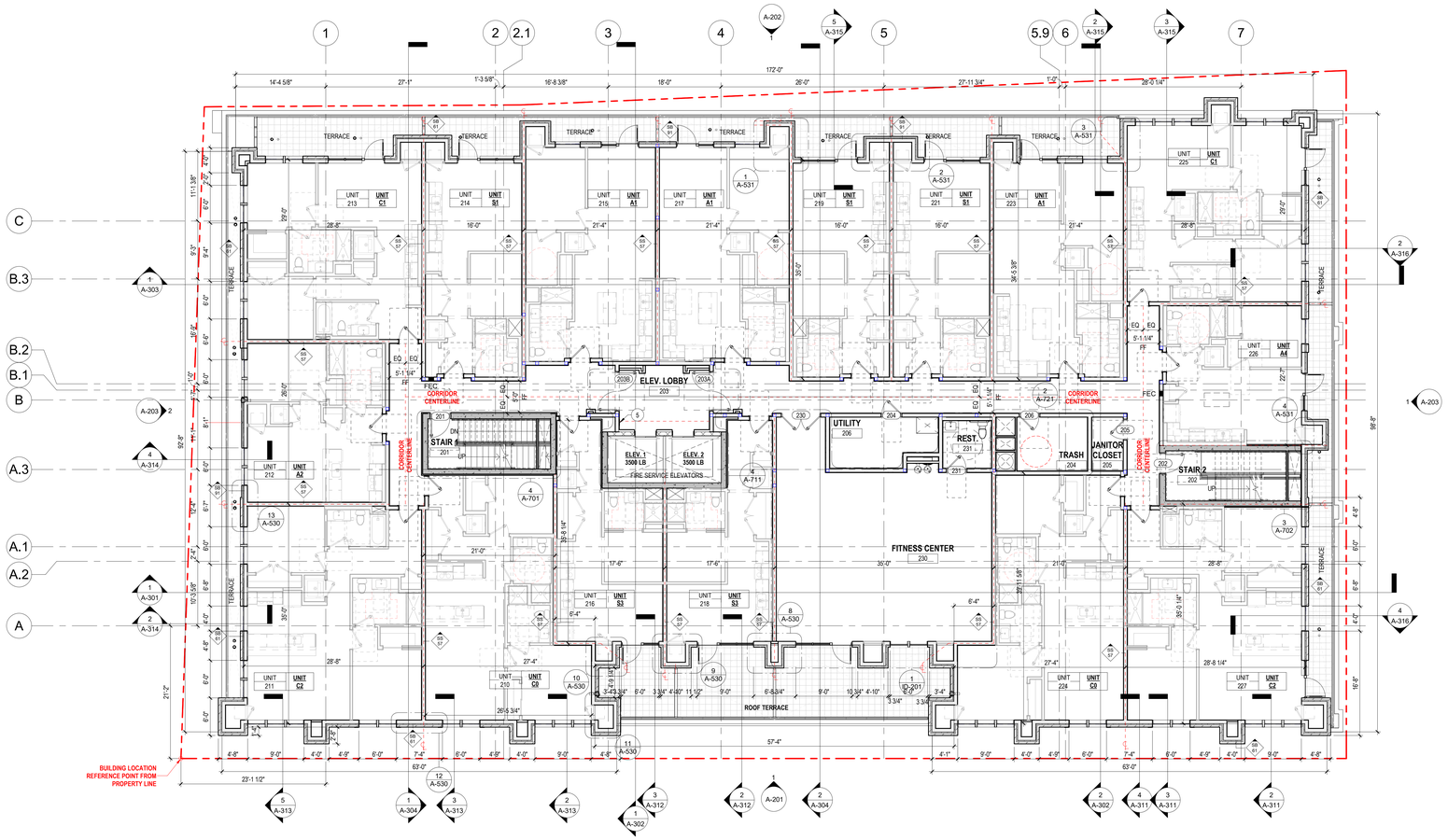
Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKG001A - ARCH - 28 Pearl Street.rvt



2 A-103 TYPICAL (3RD-8TH) FLOOR PLAN

Scale: 1/8" = 1'-0"

NOTE:
A3*: 2BR/2BA ON R2 AND R3 LEVELS (UNIT C0)
A3**: 2BR/ 2BA ON R2 LEVEL (UNIT C0)



1 A-103 2ND FLOOR PLAN

Scale: 1/8" = 1'-0"

PARKING NOTES

1. THE PARKING AREAS OF ALL BUILDINGS AND FACILITIES, INCLUDING THE BUILDINGS AND FACILITIES OF STATE AND LOCAL GOVERNMENT, SHALL IDENTIFY EACH ACCESSIBLE PARKING PACE BY A SIGN.
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2.B. PLACED FLUSH AGAINST A BUILDING STRUCTURE OR OTHER LOCATION THAT DOES NOT OBSTRUCT VEHICLE OR PEDESTRIAN TRAFFIC, IT SHALL BE AT LEAST 6 FEET, AND NOT MORE THAN 10 FEET, ABOVE THE GROUND;

PARKING LEGEND

S	STANDARD PARKING
C	COMPACT PARKING
HC	HANDICAP PARKING
HC VAN	VAN HANDICAP PARKING

KEY NOTES

1. BOLLARD
2. TRENCH DRAIN
3. 72" TALL WOOD SCREEN -REFER TO LANDSCAPE DRAWINGS
4. KNOX BOX -COLOR BLACK
5. TWO-WAY COMMUNICATION BY ELEVATOR MANUFACTURER
6. 42" ALUMINUM GUARDRAIL -REFER TO LANDSCAPE DRAWINGS

LEGEND

FCO	FLOOR CLEAN OUT (SEE PLUMBING DWGS)
FD	FLOOR DRAIN (SEE PLUMBING DWGS)
GD	GARAGE DRAIN (SEE PLUMBING DWGS)
HP	HIGH POINT
LP	LOW POINT
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
FDC	FREE STANDING FIRE DEPARTMENT CONNECTION
DS	DOWNSPOUT
OS	OVERFLOW SCUPPER
EJ	EXPANSION JOINT
FOP	FACE OF METAL PANEL
FOB	FACE OF BRICK
FOD	FACE OF DRYVIT FINISH
FOC	FACE OF CONCRETE
FOS	FACE OF STONE
FEC	FIRE EXTINGUISHER CABINET
TD	TRENCH DRAIN (SEE PLUMBING DWGS)
CG	CORNER GUARD

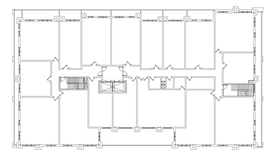
WALL TYPE LEGEND

- CONCRETE WALL (REFER TO STRUCTURAL DWGS)
- BEARING WALL (REFER TO STRUCTURAL DWGS)
- SHEAR WALL (REFER TO STRUCTURAL DWGS)
- DEMISING WALL

PARKING SCHEDULE - FIRST FLOOR PLAN

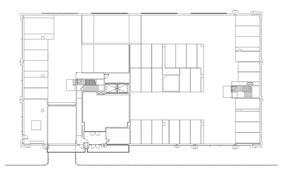
TYPE	SIZE	TOTAL	Level
HC	HC -8'-0" x 18'-0"	2	1ST FLOOR
S	STANDARD - 8'-0" x 18'-0"	28	1ST FLOOR
		30	

2ND FLOOR - KEYPLAN



PEARL ST.

FIRST FLOOR - KEYPLAN



PEARL ST.

PROJECT NORTH

ARCHITECT:
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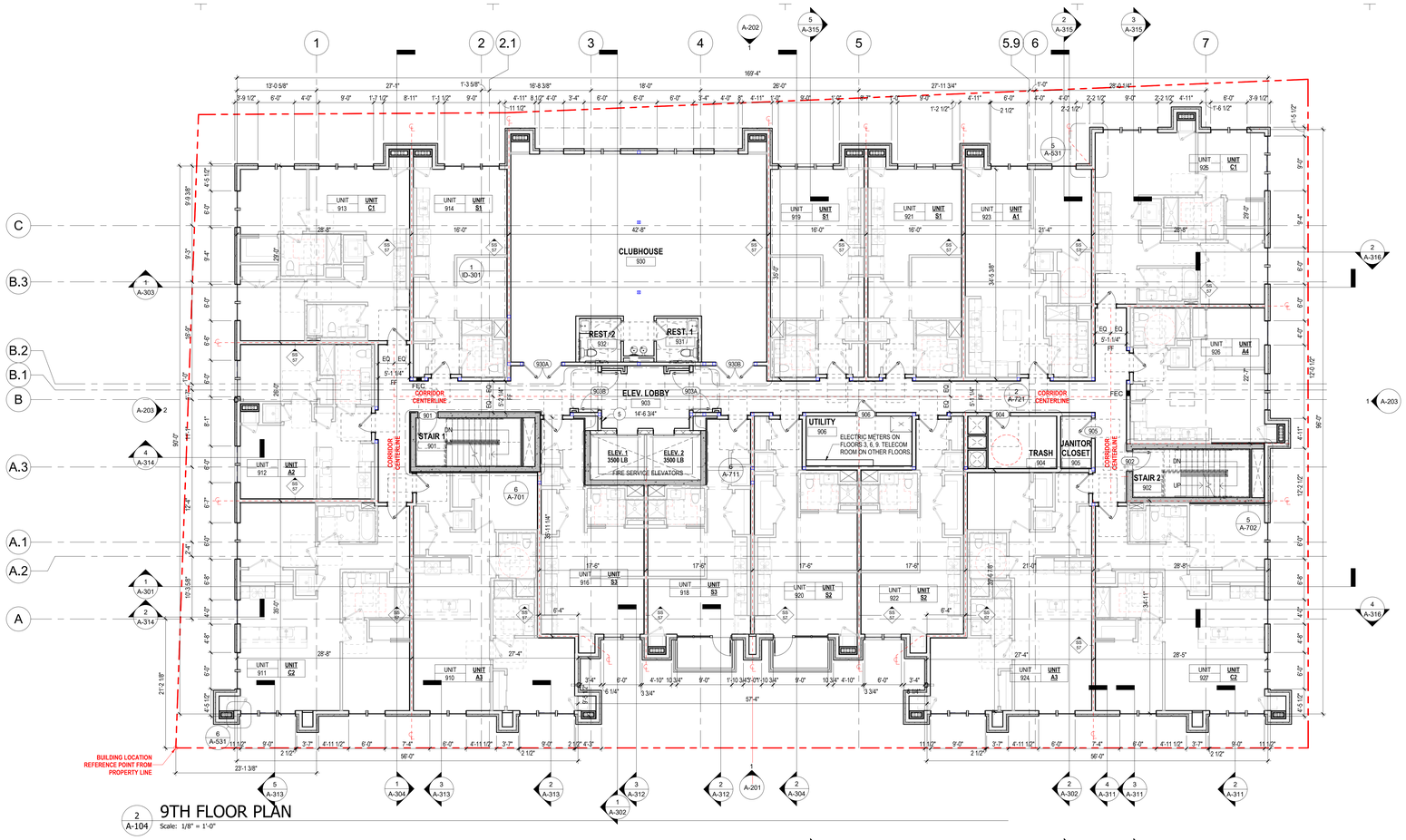
2ND & TYPICAL (3RD-7TH) FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

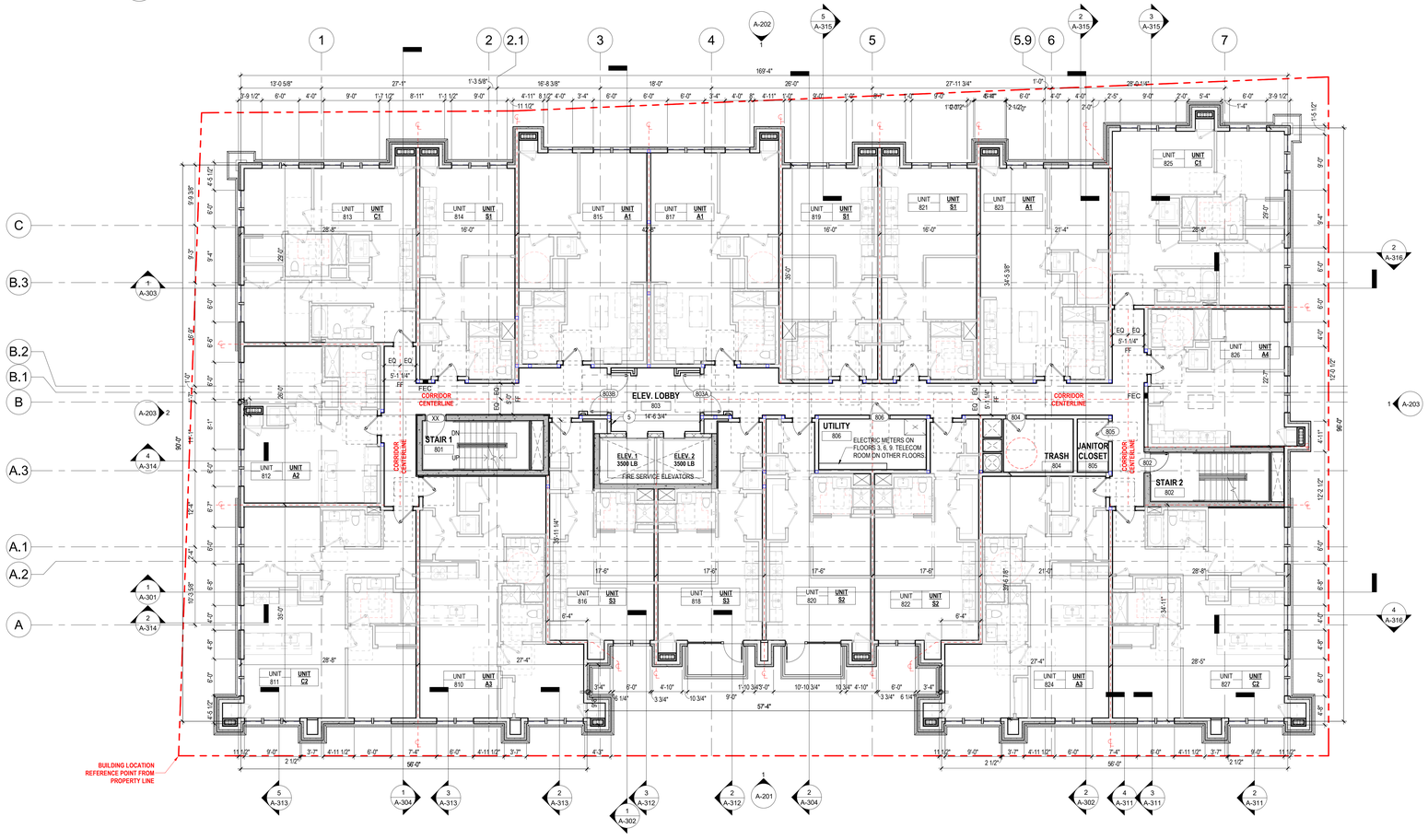
PROJECT No:	SKG-0028
DRAWN BY:	Author
CHECKED BY:	Checker
PLOT DATE:	2/7/2025 1:25:42 PM
FILE NAME:	

A-103

Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKG001A - ARCH - 28 Pearl Street.rvt



2 A-104 9TH FLOOR PLAN
Scale: 1/8" = 1'-0"



1 A-104 8TH FLOOR PLAN (DD/CD)
Scale: 1/8" = 1'-0"

PARKING NOTES

1. THE PARKING AREAS OF ALL BUILDINGS AND FACILITIES, INCLUDING THE BUILDINGS AND FACILITIES OF STATE AND LOCAL GOVERNMENT, SHALL IDENTIFY EACH ACCESSIBLE PARKING PACE BY A SIGN.
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PARKING LEGEND

S	STANDARD PARKING
C	COMPACT PARKING
HC	HANDICAP PARKING
HC VAN	VAN HANDICAP PARKING

KEY NOTES

1. BOLLARD
2. TRENCH DRAIN
3. 72" TALL WOOD SCREEN -REFER TO LANDSCAPE DRAWINGS
4. KNOX BOX -COLOR BLACK
5. TWO-WAY COMMUNICATION BY ELEVATOR MANUFACTURER
6. 42" ALUMINUM GUARDRAIL -REFER TO LANDSCAPE DRAWINGS

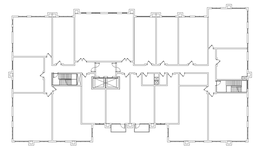
LEGEND

FCO	FLOOR CLEAN OUT (SEE PLUMBING DWGS)
FD	FLOOR DRAIN (SEE PLUMBING DWGS)
GD	GARAGE DRAIN (SEE PLUMBING DWGS)
HP	HIGH POINT
LP	LOW POINT
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
FDC	FREE STANDING FIRE DEPARTMENT CONNECTION
DS	DOWNSPOUT
OS	OVERFLOW SCUPPER
EJ	EXPANSION JOINT
FOP	FACE OF METAL PANEL
FOB	FACE OF BRICK
FOD	FACE OF DRYVIT FINISH
FOC	FACE OF CONCRETE
FOS	FACE OF STONE
FEC	FIRE EXTINGUISHER CABINET
TD	TRENCH DRAIN (SEE PLUMBING DWGS)
CG	CORNER GUARD

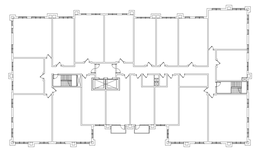
WALL TYPE LEGEND

- CONCRETE WALL (REFER TO STRUCTURAL DWGS)
- BEARING WALL (REFER TO STRUCTURAL DWGS)
- SHEAR WALL (REFER TO STRUCTURAL DWGS)
- DEMISING WALL

9TH FLOOR - KEYPLAN



(3RD-8TH) FLOOR - KEYPLAN



PROJECT NORTH

ARCHITECT:
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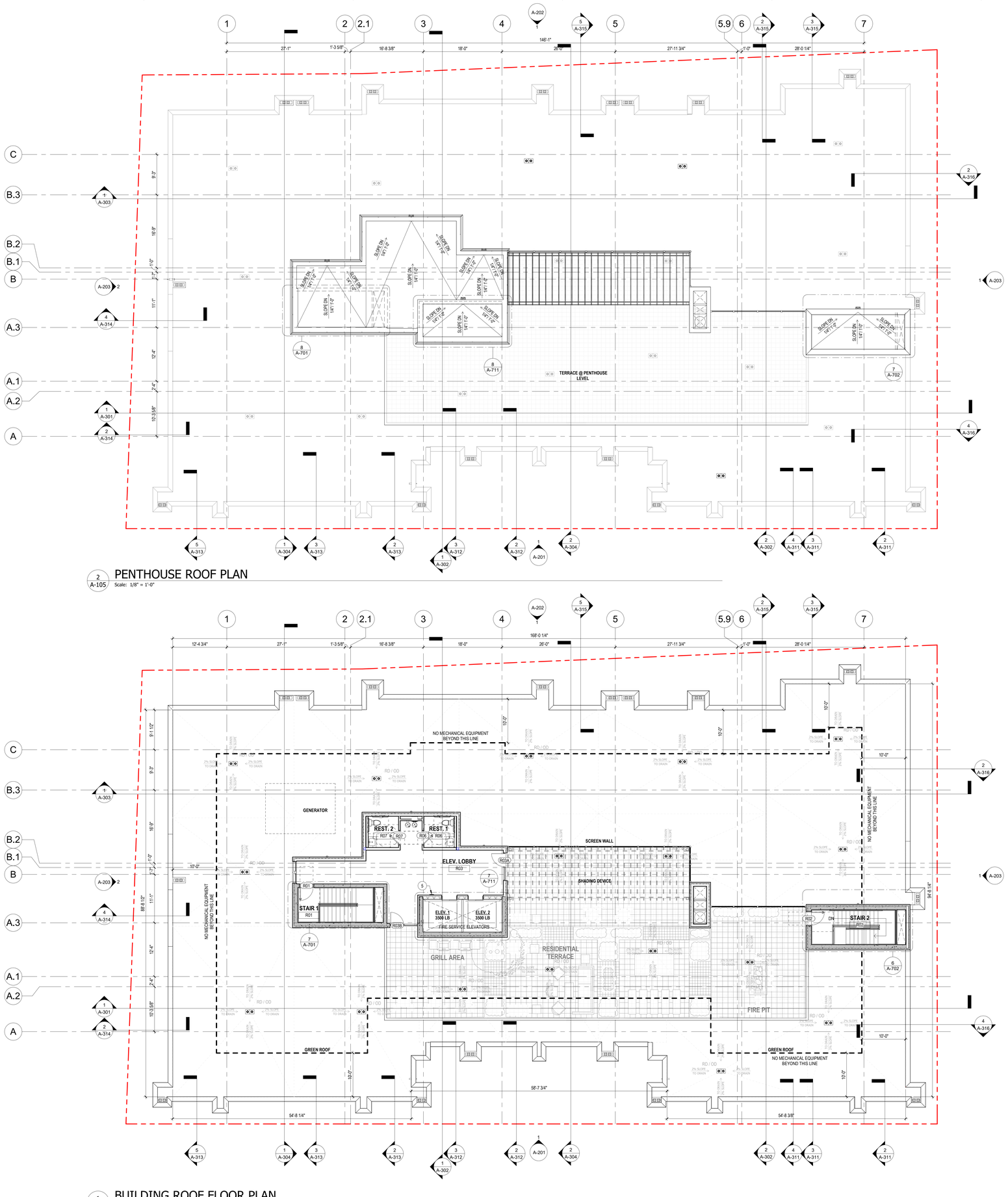
8TH & 9TH FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No:	SKG.0028
DRAWN BY:	Author
CHECKED BY:	Checker
PLOT DATE:	2/7/2025 9:55:05 AM
FILE NAME:	

A-104

Autodesk Docs://Pearl Development - SKC001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt



2 A-105 PENTHOUSE ROOF PLAN
Scale: 1/8" = 1'-0"

1 A-105 BUILDING ROOF FLOOR PLAN
Scale: 1/8" = 1'-0"

PARKING NOTES

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PARKING LEGEND

S	STANDARD PARKING
C	COMPACT PARKING
HC	HANDICAP PARKING
HC VAN	VAN HANDICAP PARKING

KEY NOTES

1. BOLLARD
2. TRENCH DRAIN
3. 72" TALL WOOD SCREEN -REFER TO LANDSCAPE DRAWINGS
4. KNOX BOX -COLOR BLACK
5. TWO-WAY COMMUNICATION BY ELEVATOR MANUFACTURER
6. 42" ALUMINUM GUARDRAIL -REFER TO LANDSCAPE DRAWINGS

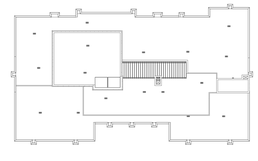
LEGEND

FCO	FLOOR CLEAN OUT (SEE PLUMBING DWGS)
FD	FLOOR DRAIN (SEE PLUMBING DWGS)
GD	GARAGE DRAIN (SEE PLUMBING DWGS)
HP	HIGH POINT
LP	LOW POINT
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
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DS	DOWNSPOUT
OS	OVERFLOW SCUPPER
EJ	EXPANSION JOINT
FOP	FACE OF METAL PANEL
FOB	FACE OF BRICK
FOD	FACE OF DRYVIT FINISH
FOC	FACE OF CONCRETE
FOS	FACE OF STONE
FEC	FIRE EXTINGUISHER CABINET
TD	TRENCH DRAIN (SEE PLUMBING DWGS)
CG	CORNER GUARD

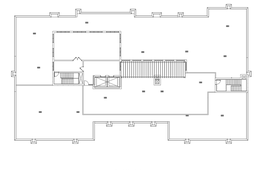
WALL TYPE LEGEND

- CONCRETE WALL (REFER TO STRUCTURAL DWGS)
- BEARING WALL (REFER TO STRUCTURAL DWGS)
- SHEAR WALL (REFER TO STRUCTURAL DWGS)
- DEMISING WALL

PENTHOUSE - KEYPLAN



ROOF - KEYPLAN



PROJECT NORTH

ARCHITECT:
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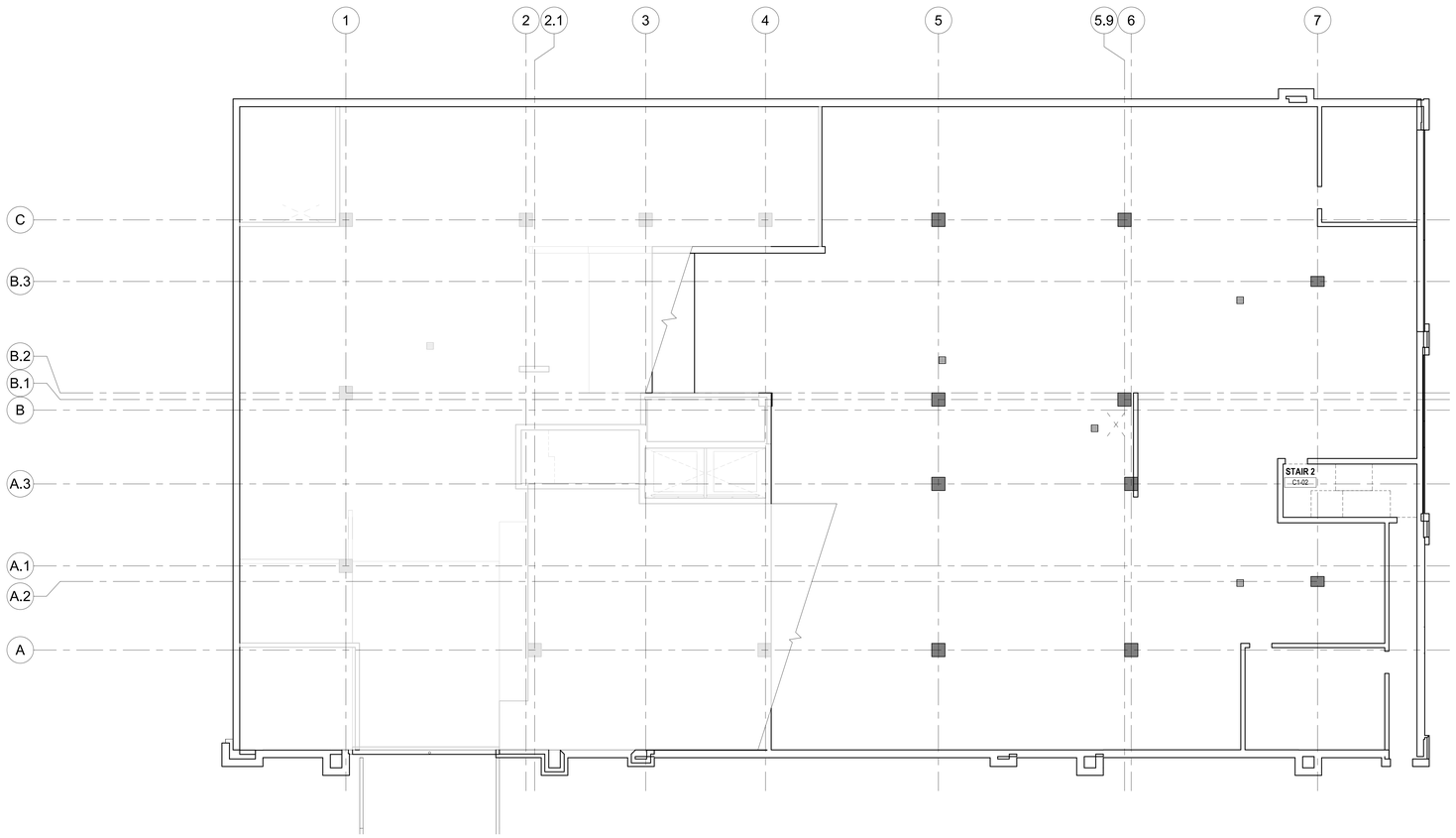
BUILDING ROOF & PENTHOUSE ROOF FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 9:55:08 AM
FILE NAME:

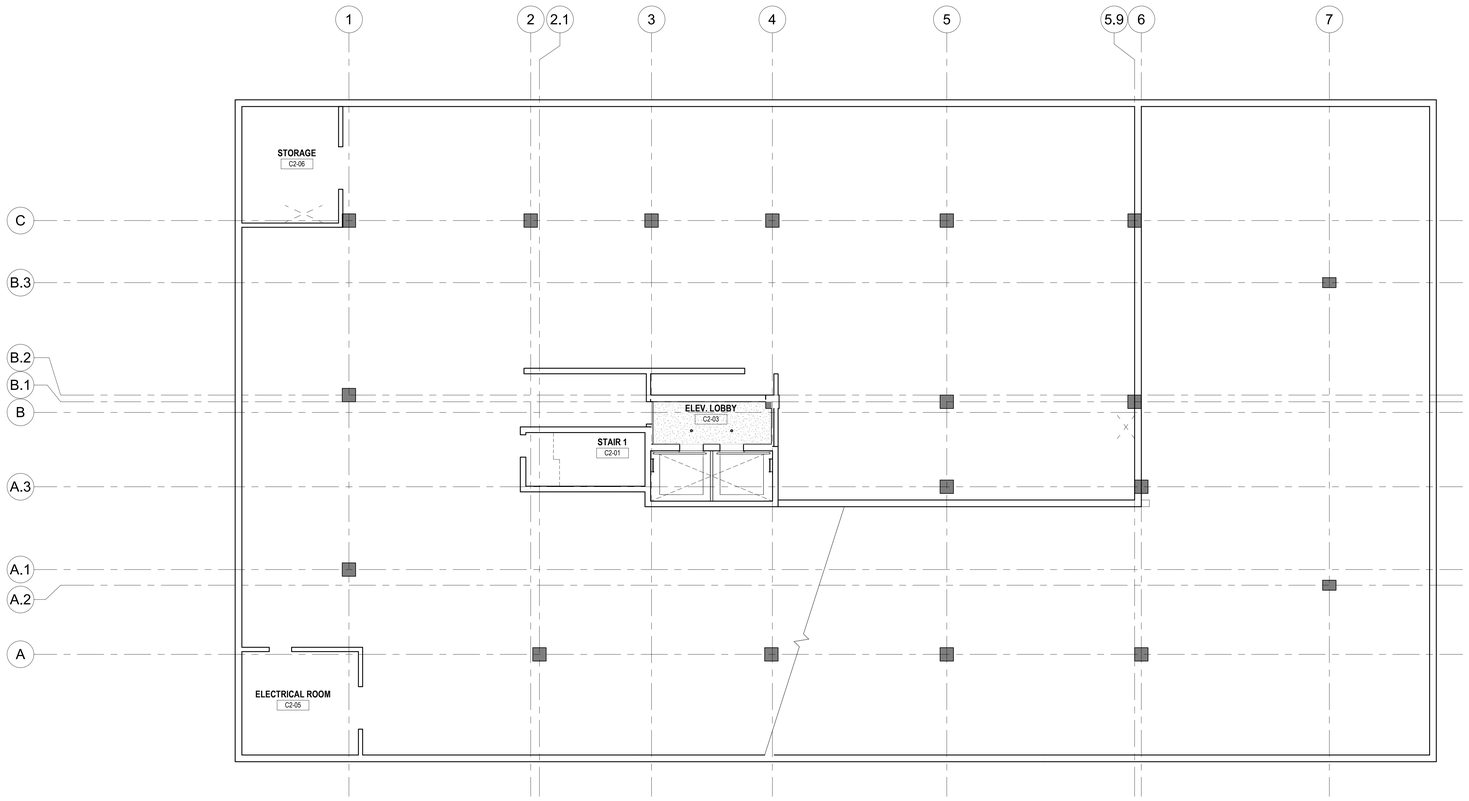
A-105

Autodesk Docs://Pearl Development - SKC091A - 28 Pearl St(SKC091A - ARCH - 28 Pearl Street.rvt



1 A-131 CELLAR 1 RCP PLAN

Scale: 1/8" = 1'-0"



2 A-131 CELLAR 2 RCP PLAN

Scale: 1/8" = 1'-0"

RCP GENERAL NOTES

1. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH INTERIOR DESIGN DRAWINGS.
2. SEE A-400 SERIES DRAWINGS FOR ENLARGED UNIT REFLECTED CEILING PLANS.
3. CEILING MOUNTED LIGHT FIXTURES SHOWN FOR GENERAL LOCATION ONLY. REFER TO ELECTRICAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION.

RCP LEGEND

- DROP GYPSUM CEILING
- R-15 MIN. CLOSED CELL SPRAY FOAM INSULATION

MECAHNICAL ELEMENTS LEGEND

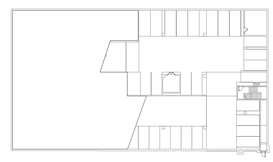
- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

CORRIDOR & EXTERIOR LIGHT FIXTURE LEGEND

(REFER TO ID & ELECTRICAL DWGS. FOR LIGHT FIXTURE DESCRIPTIONS)

- LAC-1 RECESSED DOWNLIGHT
- CAN-1 RECESSED LED DOWNLIGHT
- A/B GARAGE/ UTILITY LED LIGHT
- LT-18 UNIT ENTRY WALL SCONCE

CELLAR 1 - KEYPLAN



CELLAR 2 - KEYPLAN



PROJECT NORTH

ARCHITECT:

lessard DESIGN INC. P.C.

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

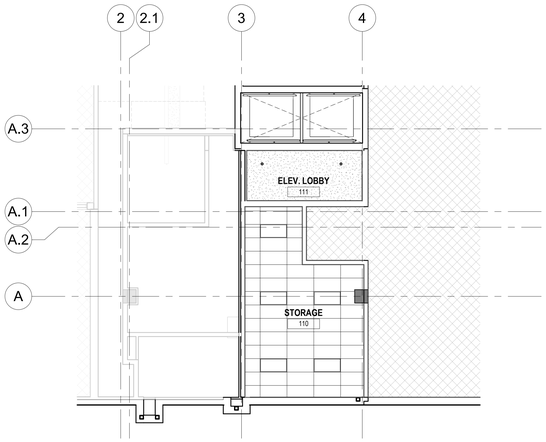
CELLAR 2 & CELLAR 1 RCP

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
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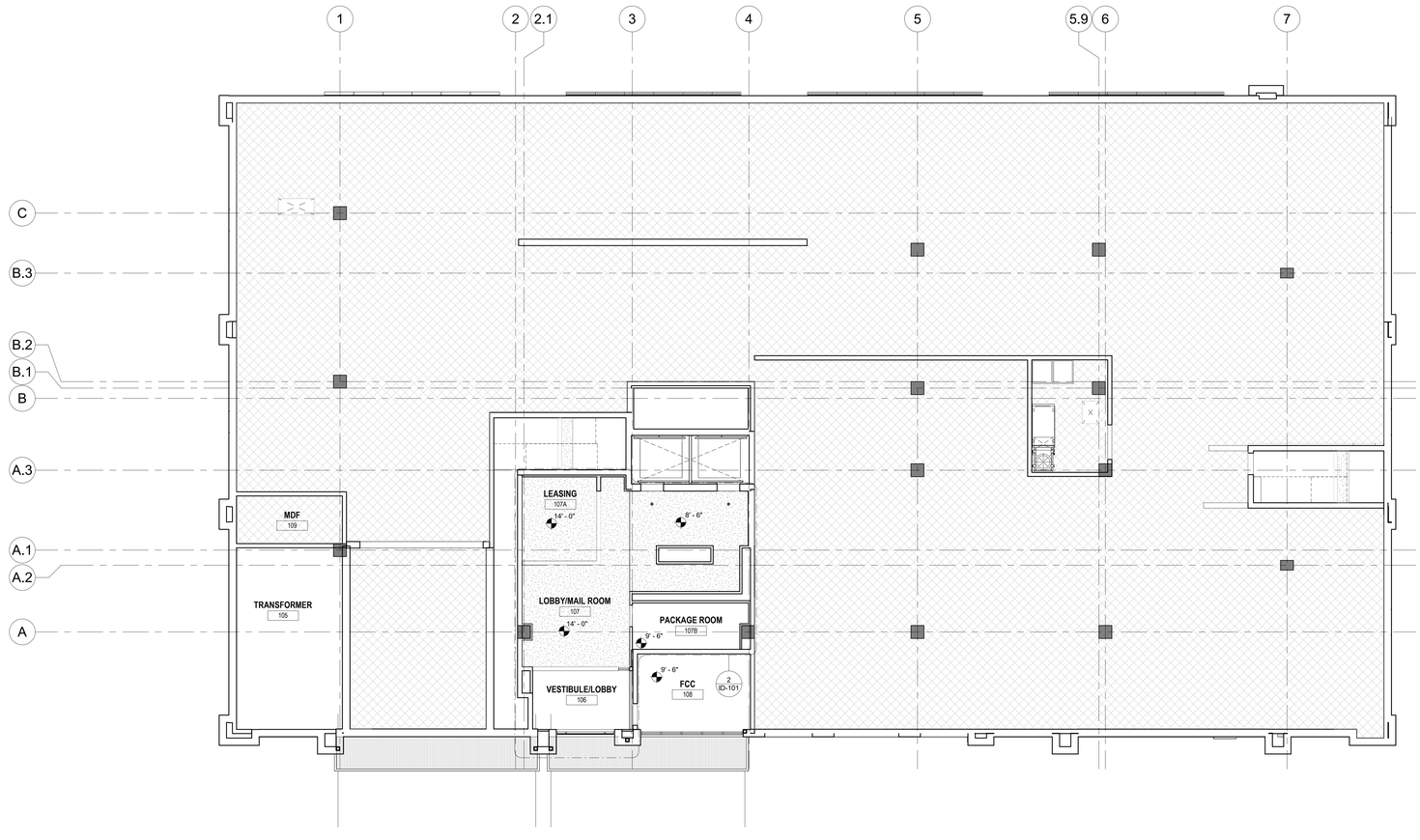
A-131

Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKG001A - ARCH - 28 Pearl Street.rvt



3 A-132 FIRST FLOOR UPPER ELEV. LOBBY & STORAGE RCP

Scale: 1/8" = 1'-0"



1 A-132 FIRST FLOOR RCP

Scale: 1/8" = 1'-0"

RCP GENERAL NOTES

1. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH INTERIOR DESIGN DRAWINGS.
2. SEE A-400 SERIES DRAWINGS FOR ENLARGED UNIT REFLECTED CEILING PLANS.
3. CEILING MOUNTED LIGHT FIXTURES SHOWN FOR GENERAL LOCATION ONLY. REFER TO ELECTRICAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION.

RCP LEGEND

- DROP GYPSUM CEILING
- R-15 MIN. CLOSED CELL SPRAY FOAM INSULATION

MECAHNICAL ELEMENTS LEGEND

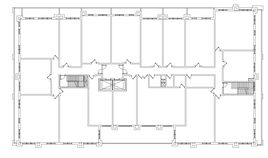
- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- (S) SMOKE DETECTOR DEVICE

CORRIDOR & EXTERIOR LIGHT FIXTURE LEGEND

(REFER TO ID & ELECTRICAL DWGS. FOR LIGHT FIXTURE DESCRIPTIONS)

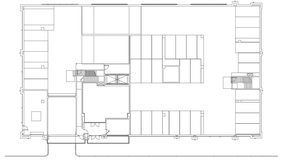
LAC-1	RECESSED DOWNLIGHT
CAN-1	RECESSED LED DOWNLIGHT
A/B	GARAGE/ UTILITY LED LIGHT
LT-18	UNIT ENTRY WALL SCONCE

2ND FLOOR - KEYPLAN



PEARL ST.

FIRST FLOOR - KEYPLAN



PEARL ST.

PROJECT NORTH

ARCHITECT:

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

FIRST FLOOR & UPPER ELEVATOR LOBBY RCP

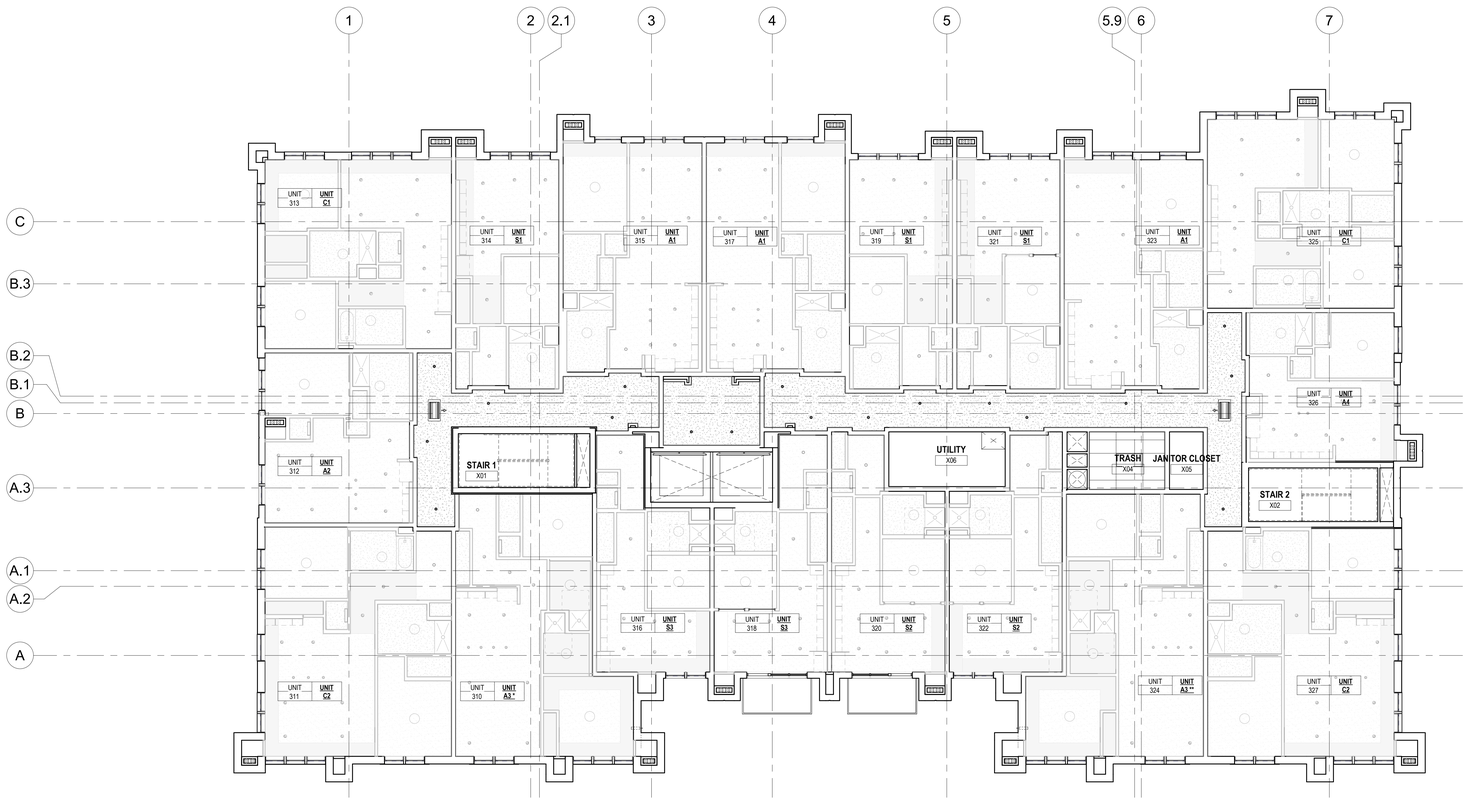
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A-132

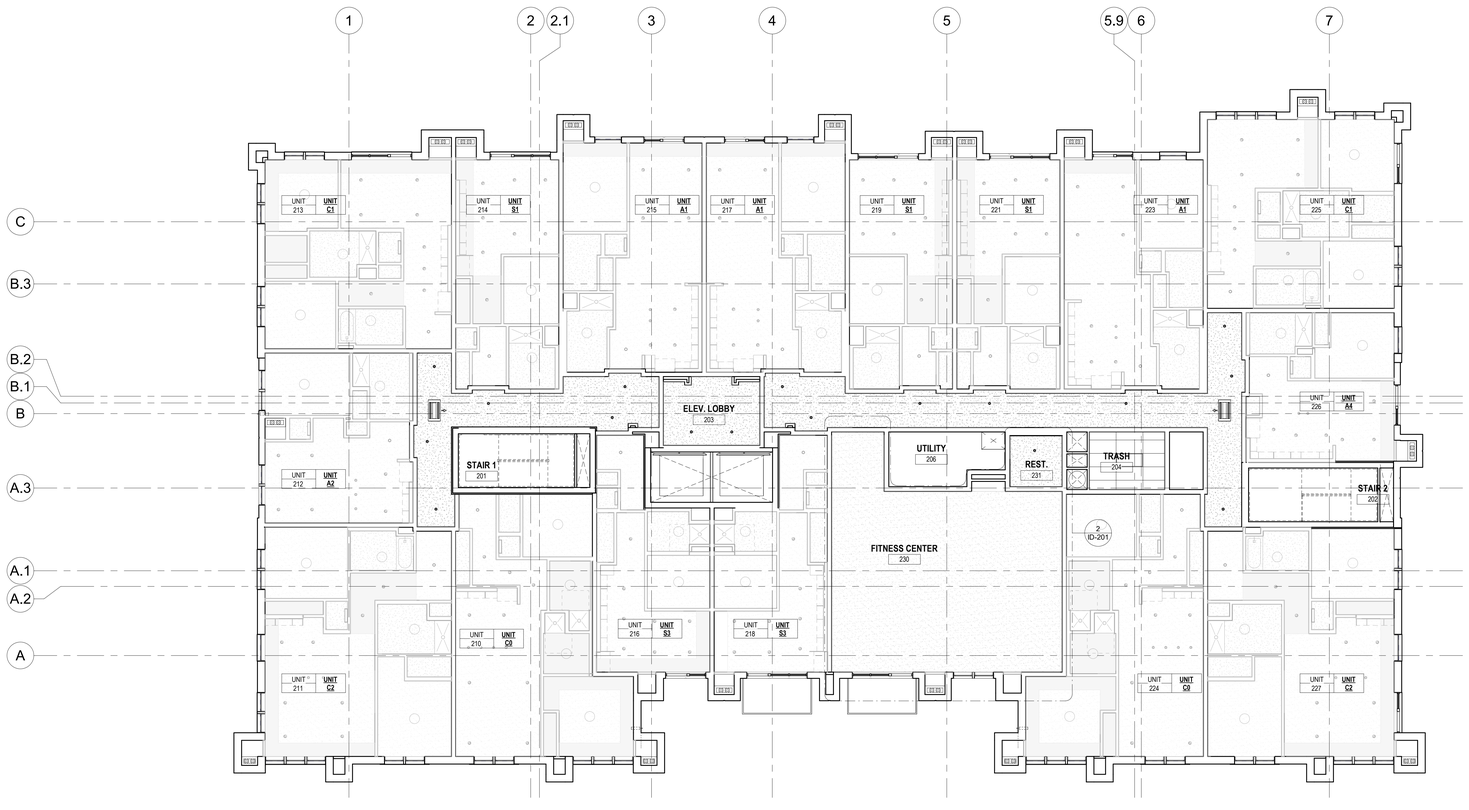
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1 A-133 TYPICAL (3RD-7TH) FLOOR RCP PLAN

Scale: 1/8" = 1'-0"



2 A-133 2ND FLOOR RCP PLAN

Scale: 1/8" = 1'-0"

RCP GENERAL NOTES

1. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH INTERIOR DESIGN DRAWINGS.
2. SEE A-400 SERIES DRAWINGS FOR ENLARGED UNIT REFLECTED CEILING PLANS.
3. CEILING MOUNTED LIGHT FIXTURES SHOWN FOR GENERAL LOCATION ONLY. REFER TO ELECTRICAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION.

RCP LEGEND

- DROP GYPSUM CEILING
- R-15 MIN. CLOSED CELL SPRAY FOAM INSULATION

MECAHNICAL ELEMENTS LEGEND

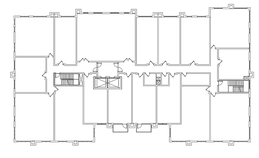
- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- S SMOKE DETECTOR DEVICE

CORRIDOR & EXTERIOR LIGHT FIXTURE LEGEND

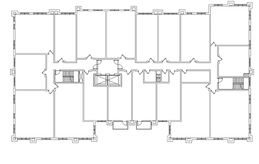
(REFER TO ID & ELECTRICAL DWGS. FOR LIGHT FIXTURE DESCRIPTIONS)

- LAC-1 RECESSED DOWNLIGHT
- CAN-1 RECESSED LED DOWNLIGHT
- A/B GARAGE/ UTILITY LED LIGHT
- LT-18 UNIT ENTRY WALL SCONCE

9TH FLOOR - KEYPLAN



(3RD-8TH) FLOOR - KEYPLAN



PROJECT NORTH

ARCHITECT:

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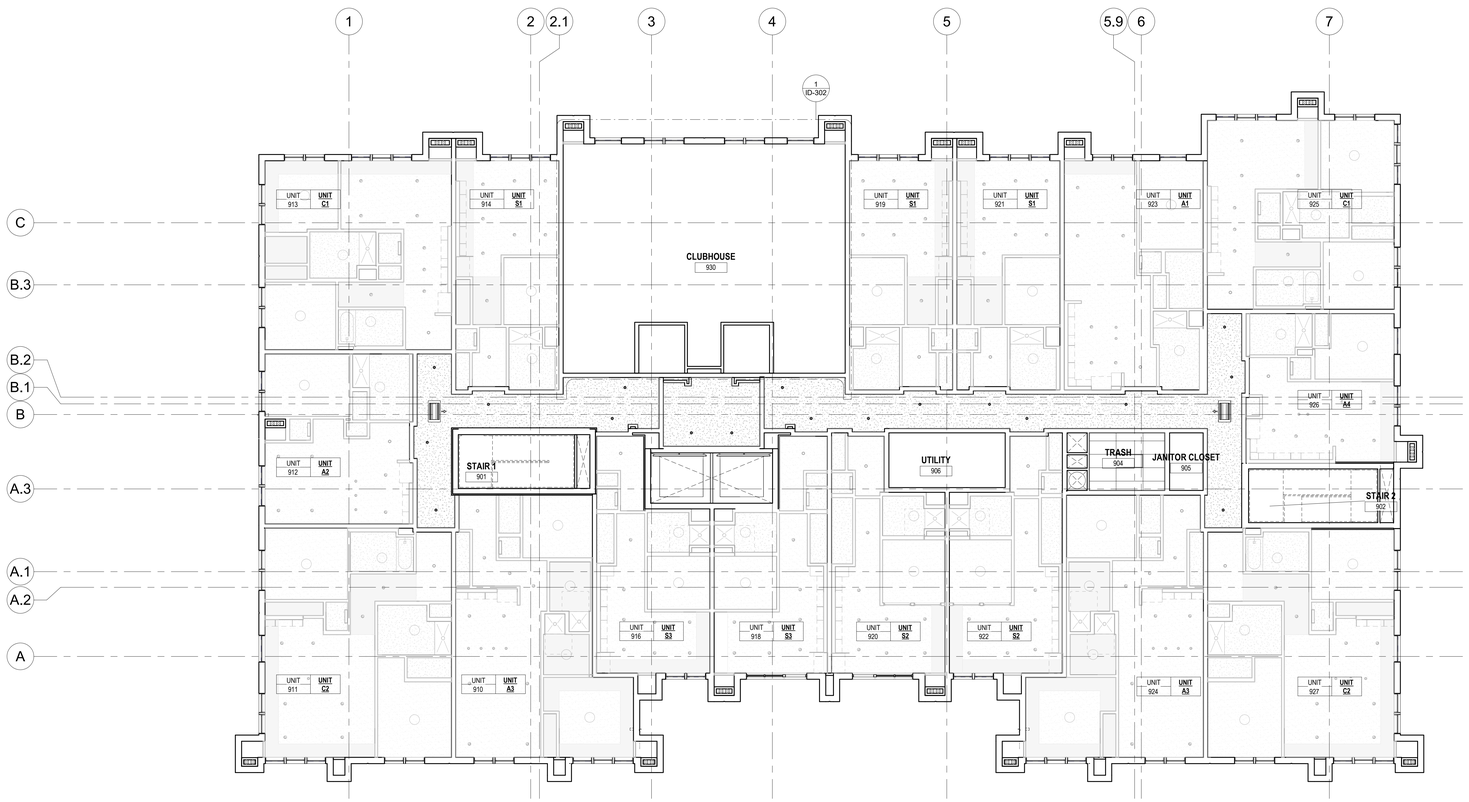
2ND & TYPICAL (3RD-7TH) RCP

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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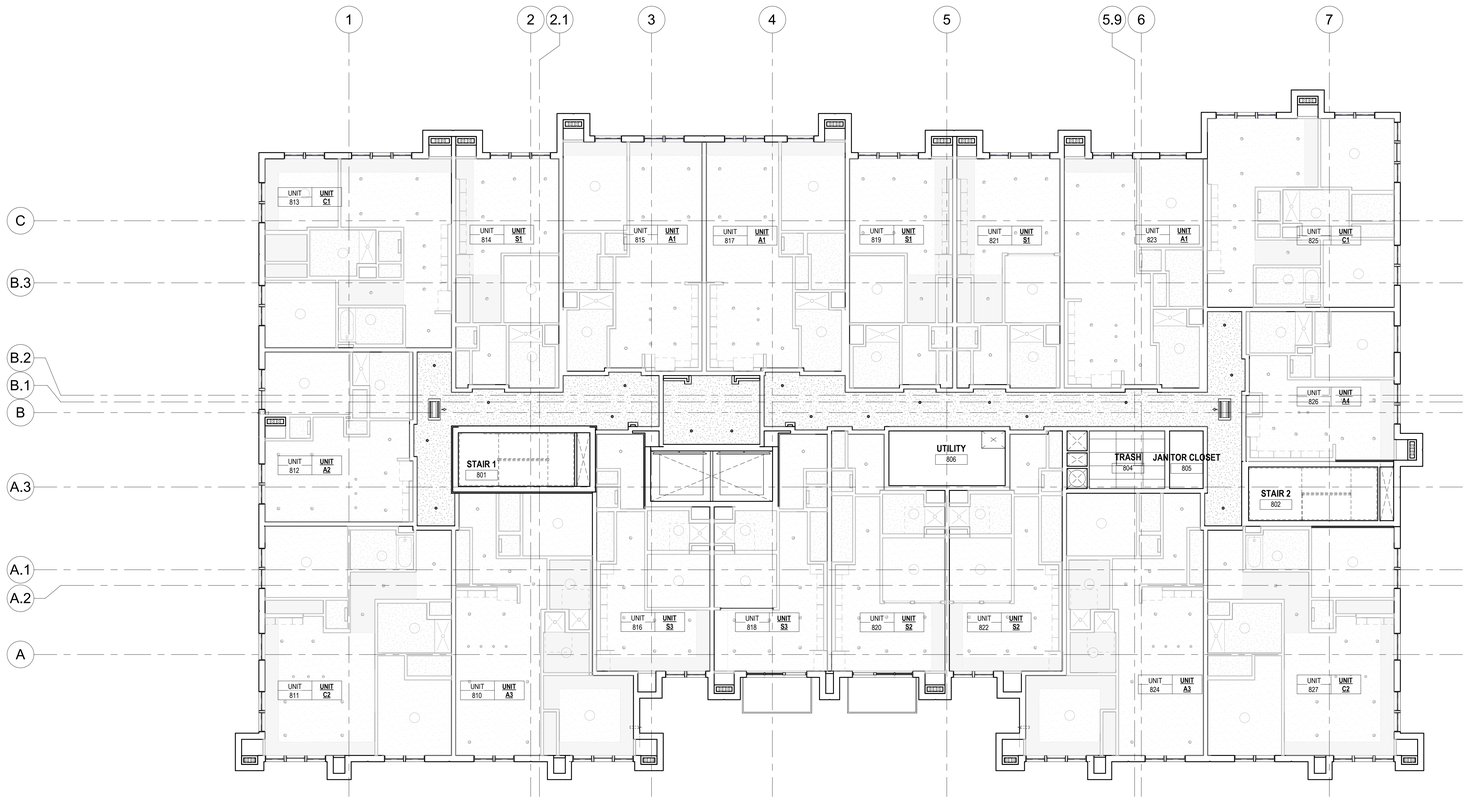
A-133

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2 A-134 9TH FLOOR RCP PLAN

Scale: 1/8" = 1'-0"



1 A-134 8TH FLOOR RCP PLAN

Scale: 1/8" = 1'-0"

RCP GENERAL NOTES

1. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH INTERIOR DESIGN DRAWINGS.
2. SEE A-400 SERIES DRAWINGS FOR ENLARGED UNIT REFLECTED CEILING PLANS.
3. CEILING MOUNTED LIGHT FIXTURES SHOWN FOR GENERAL LOCATION ONLY. REFER TO ELECTRICAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION.

RCP LEGEND

DROP GYPSUM CEILING

R-15 MIN. CLOSED CELL SPRAY FOAM INSULATION

MECAHNICAL ELEMENTS LEGEND

SUPPLY DIFFUSER

MECH. EXHAUST FAN

FIRE ALARM DEVICE

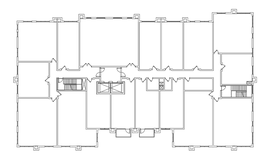
SMOKE DETECTOR DEVICE

CORRIDOR & EXTERIOR LIGHT FIXTURE LEGEND

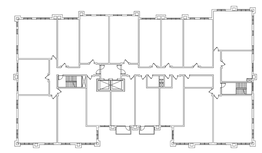
(REFER TO ID & ELECTRICAL DWGS. FOR LIGHT FIXTURE DESCRIPTIONS)

LAC-1	RECESSED DOWNLIGHT
CAN-1	RECESSED LED DOWNLIGHT
A/B	GARAGE/ UTILITY LED LIGHT
LT-18	UNIT ENTRY WALL SCONCE

9TH FLOOR - KEYPLAN



(3RD-8TH) FLOOR - KEYPLAN



PROJECT NORTH

ARCHITECT:

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PORT CHESTER, NY

8TH & 9TH RCP

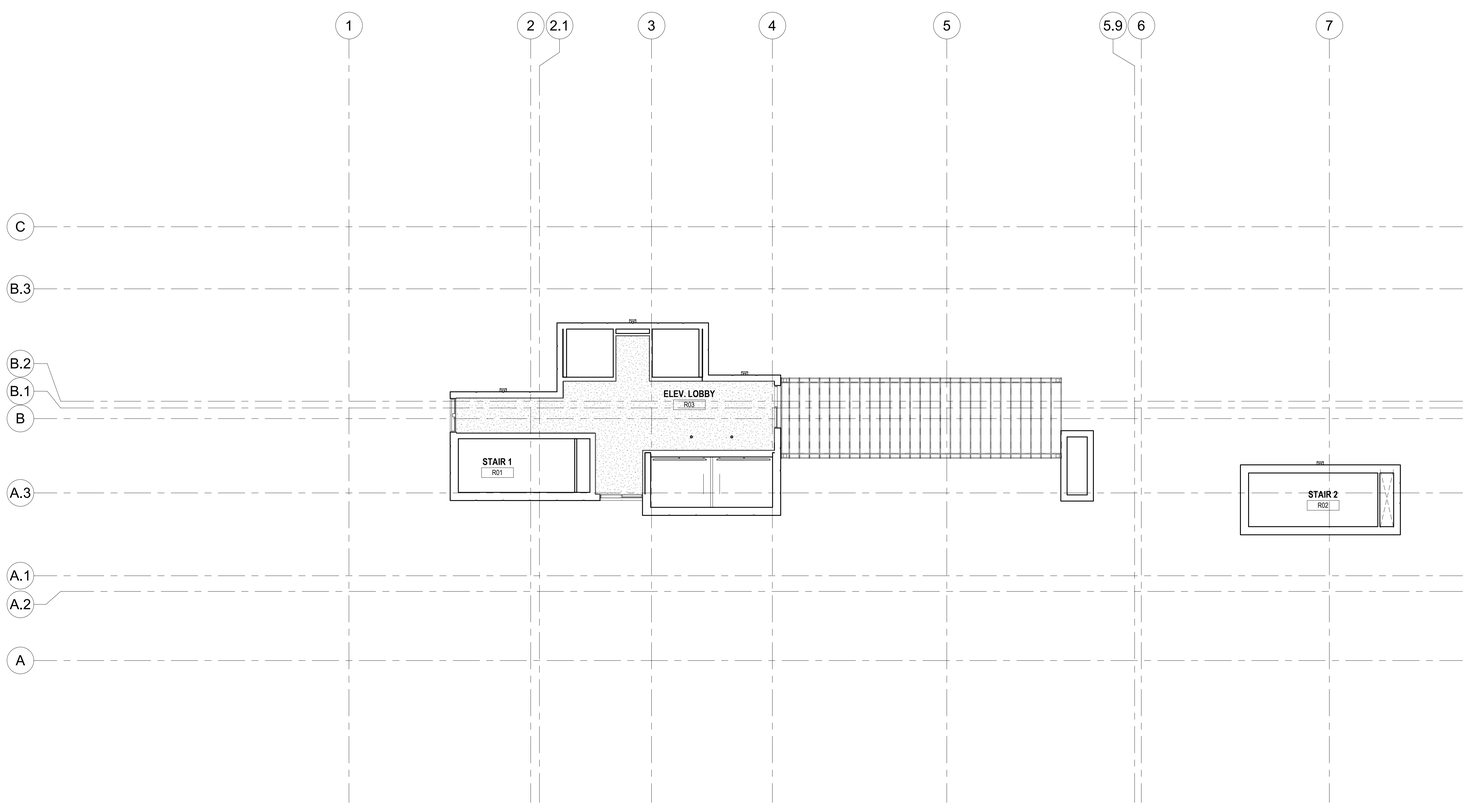
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1 A-135 BUILDING ROOF RCP PLAN
Scale: 1/8" = 1'-0"

RCP GENERAL NOTES

1. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH INTERIOR DESIGN DRAWINGS.
2. SEE A-400 SERIES DRAWINGS FOR ENLARGED UNIT REFLECTED CEILING PLANS.
3. CEILING MOUNTED LIGHT FIXTURES SHOWN FOR GENERAL LOCATION ONLY. REFER TO ELECTRICAL AND INTERIOR DESIGN DRAWINGS FOR ADDITIONAL INFORMATION.

RCP LEGEND

- DROP GYPSUM CEILING
- R-15 MIN. CLOSED CELL SPRAY FOAM INSULATION

MECAHNICAL ELEMENTS LEGEND

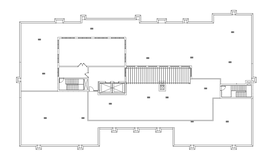
- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

CORRIDOR & EXTERIOR LIGHT FIXTURE LEGEND

(REFER TO ID & ELECTRICAL DWGS. FOR LIGHT FIXTURE DESCRIPTIONS)

LAC-1	RECESSED DOWNLIGHT
CAN-1	RECESSED LED DOWNLIGHT
A/B	GARAGE/ UTILITY LED LIGHT
LT-18	UNIT ENTRY WALL SCONCE

ROOF - KEYPLAN



PEARL ST.

PROJECT NORTH

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

BUILDING ROOF RCP

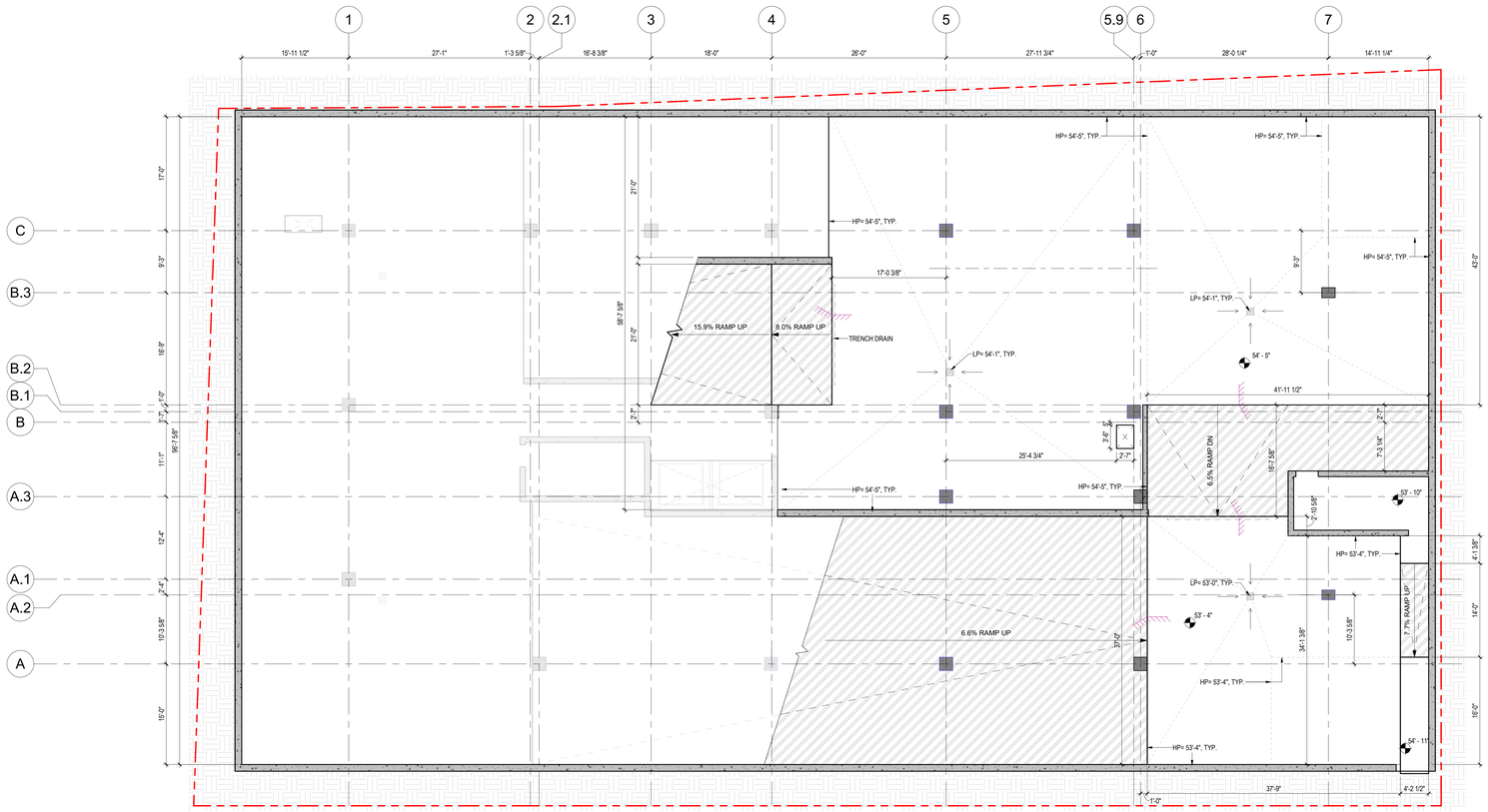
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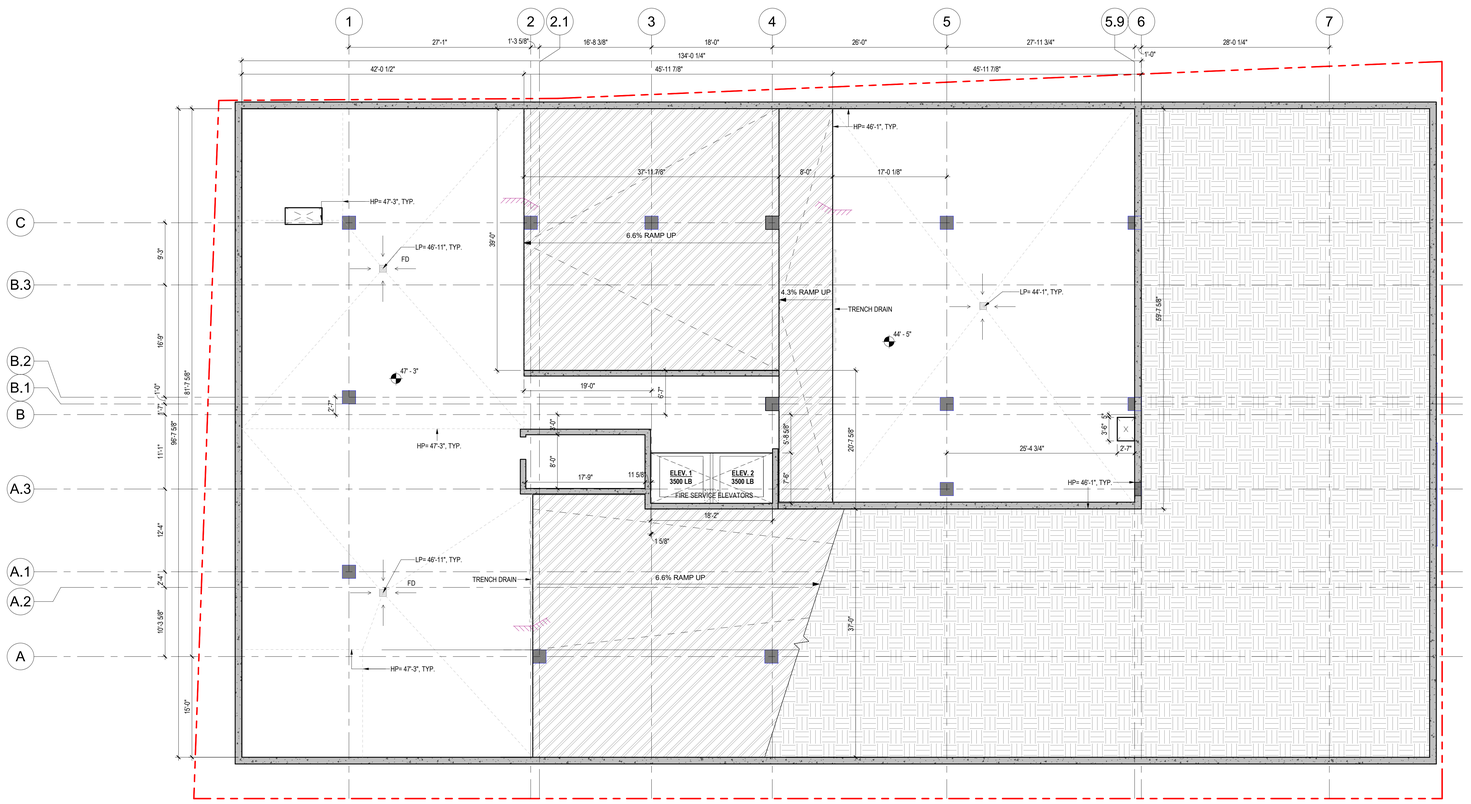
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1 A-141 CELLAR 1 FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"



2 A-141 CELLAR 2 FLOOR PLAN

Scale: 1/8" = 1'-0"

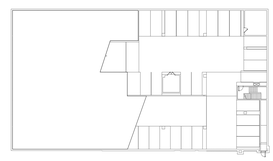
SLAB EDGE PLAN GENERAL NOTES

1. GC TO REVIEW ALL FLOOR FINISHES INCLUDING ARCHITECTURAL PLANS AND INTERIOR DESIGN DRAWINGS AND PROVIDE THE REQUIRED SLAB RECESS TO ACCOMMODATE A FINISHED FLOOR WITHOUT SLOPES OR OTHER VERTICAL TRANSITIONS.
2. 1/2" SLAB STEP AND 1" TAPER FOR DRAINAGE SLOPE AT ALL ELEVATED BALCONY SLABS. REFER TO STRUCTURAL DRAWINGS AND ARCHITECTURAL DETAILS.
3. SLAB EDGE TO BE COORDINATED WITH MEP AND STRUCTURAL WORK.
4. CONTRACTOR SHALL PROVIDE COORDINATION PLANS AS REQUIRED BY SPEC SECTION 01 3100.
5. SEE STRUCTURAL DRAWINGS FOR COLUMN AND BEAM SCHEDULES.
6. DIMENSIONS ARE TO FACE OF CONCRETE, TO HOLD FACE OF COLUMNS AND TO MAIN GRID LINES.
7. SPOT ELEVATIONS INDICATE TOP OF STRUCTURAL SLAB UNLESS OTHERWISE NOTED.
8. CONTRACTOR TO COORDINATE OPENINGS IN CONCRETE WALLS FOR OPENINGS WITH SCHEDULES AND MANUFACTURERS REQUIREMENTS.
9. ARCHITECTURAL SLAB EDGE PLAN DIMENSIONS SUPERCEDE DIMENSIONS ON STRUCTURAL PLANS AND SHALL BE COORDINATED WITH ALL REMAINING ARCHITECTURAL PLANS ACCORDINGLY.
10. IF NOT DIMENSIONED, COLUMNS ARE TO BE CENTERED ON THE GRID LINE SHOWN.

SLAB EDGE PLAN LEGEND

- SLAB OPENING
- ELEVATED BALCONY SLAB
- RAMP
- EARTH FILLING
- 1/2" DOOR NOTCH
- CONCRETE CURB ; REFER TO STRUCT DWGS
- 3'-6" HIGH CONCRETE WALL ; REFER TO STRUCT DWGS
- TOP OF SLAB ELEVATIONS
- DIRECTION OF STRUCTURAL SLAB SLOPE
- STEP IN STRUCTURAL SLAB WITH DIMENSION INDICATED
- COLUMN BELOW
- PLUMBING FIXTURE, SEE PLUMBING DWGS
- FD RD FCO — DRAINS, SEE PLUMBING DWGS
- TD
- CIRCLES REPRESENTS MECHANICAL SLEEVES THROUGH FLOOR AND ROOF SLABS. GC TO COORDINATE WITH MECH. DWGS. CORE DRILL OF SLEEVE LOCATIONS IN AREA ASSIGNED. FIRE SAF PENETRATIONS THROUGH FLOOR TO MAINTAIN ASSEMBLY RATING. FOR EXTENT OF SLEEVE LOCATIONS, REFER TO 400'S SERIES UNIT PLANS.
- R D / O D — ROOF DRAIN/OVERFLOW DRAIN SLEEVE, REFER TO PLUMBING DWGS

CELLAR 1 - KEYPLAN



CELLAR 2 - KEYPLAN



PROJECT NORTH

ARCHITECT:
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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

CELLAR 2 & CELLAR 1 SLAB PLAN

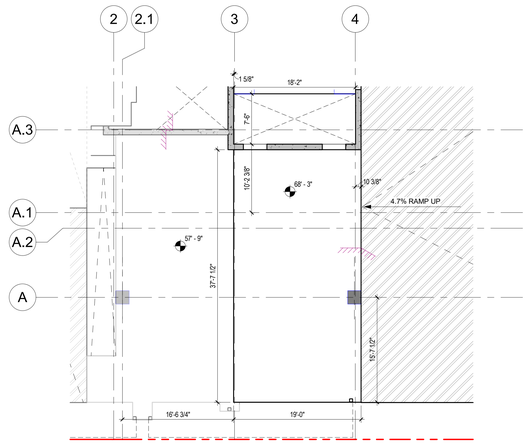
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A-141

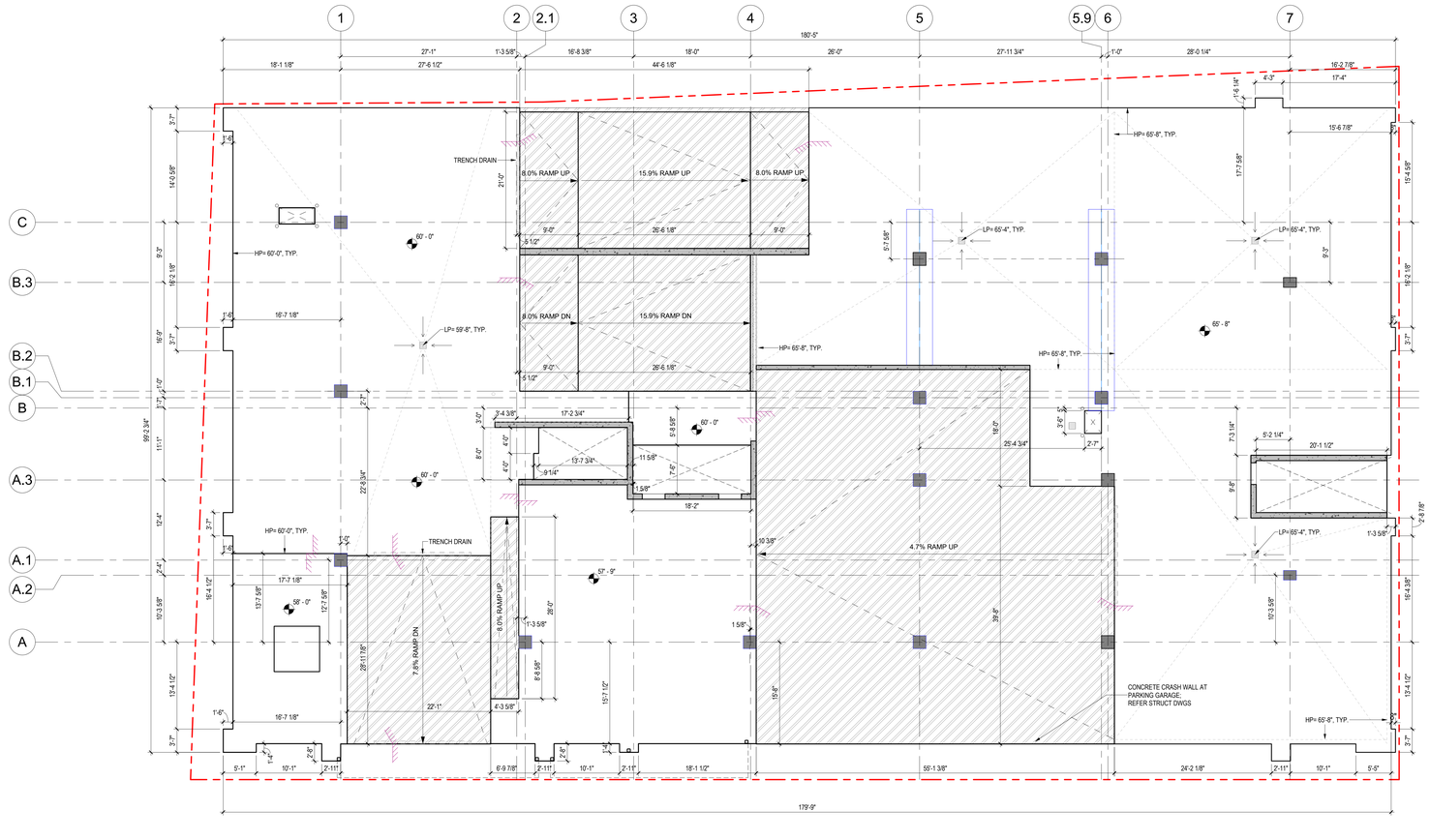
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3 A-142 ELEV. LOBBY & STORAGE @ 68'-3" SLAB PLAN

Scale: 1/8" = 1'-0"



1 A-142 1ST FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"

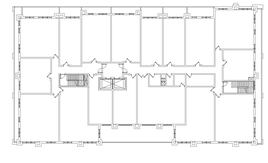
SLAB EDGE PLAN GENERAL NOTES

1. GC TO REVIEW ALL FLOOR FINISHES INCLUDING ARCHITECTURAL PLANS AND INTERIOR DESIGN DRAWINGS AND PROVIDE THE REQUIRED SLAB RECESS TO ACCOMMODATE A FINISHED FLOOR WITHOUT SLOPES OR OTHER VERTICAL TRANSITIONS.
2. 1/2" SLAB STEP AND 1" TAPER FOR DRAINAGE SLOPE AT ALL ELEVATED BALCONY SLABS. REFER TO STRUCTURAL DRAWINGS AND ARCHITECTURAL DETAILS.
3. SLAB EDGE TO BE COORDINATED WITH MEP AND STRUCTURAL WORK.
4. CONTRACTOR SHALL PROVIDE COORDINATION PLANS AS REQUIRED BY SPEC SECTION 01 3100.
5. SEE STRUCTURAL DRAWINGS FOR COLUMN AND BEAM SCHEDULES.
6. DIMENSIONS ARE TO FACE OF CONCRETE, TO HOLD FACE OF COLUMNS AND TO MAIN GRID LINES.
7. SPOT ELEVATIONS INDICATE TOP OF STRUCTURAL SLAB UNLESS OTHERWISE NOTED.
8. CONTRACTOR TO COORDINATE OPENINGS IN CONCRETE WALLS FOR OPENINGS WITH SCHEDULES AND MANUFACTURERS REQUIREMENTS.
9. ARCHITECTURAL SLAB EDGE PLAN DIMENSIONS SUPERCEDE DIMENSIONS ON STRUCTURAL PLANS AND SHALL BE COORDINATED WITH ALL REMAINING ARCHITECTURAL PLANS ACCORDINGLY.
10. IF NOT DIMENSIONED, COLUMNS ARE TO BE CENTERED ON THE GRID LINE SHOWN.

SLAB EDGE PLAN LEGEND

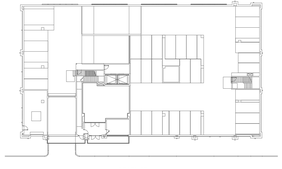
- SLAB OPENING
- ELEVATED BALCONY SLAB
- RAMP
- EARTH FILLING
- 1/2" DOOR NOTCH
- CONCRETE CURB ; REFER TO STRUCT DWGS
- 3'-6" HIGH CONCRETE WALL ; REFER TO STRUCT DWGS
- TOP OF SLAB ELEVATIONS
- DIRECTION OF STRUCTURAL SLAB SLOPE
- STEP IN STRUCTURAL SLAB WITH DIMENSION INDICATED
- COLUMN BELOW
- PLUMBING FIXTURE, SEE PLUMBING DWGS
- FD RD FCO — DRAINS, SEE PLUMBING DWGS
- TD
- CIRCLES REPRESENTS MECHANICAL SLEEVES THROUGH FLOOR AND ROOF SLABS. GC TO COORDINATE WITH MECH. DWGS. CORE DRILL OF SLEEVE LOCATIONS IN AREA ASSIGNED. FIRE SAF PENETRATIONS THROUGH FLOOR TO MAINTAIN ASSEMBLY RATING. FOR EXTENT OF SLEEVE LOCATIONS, REFER TO 400'S SERIES UNIT PLANS.
- R.D / O.D — ROOF DRAIN/OVERFLOW DRAIN SLEEVE, REFER TO PLUMBING DWGS

2ND FLOOR - KEYPLAN



PEARL ST.

FIRST FLOOR - KEYPLAN



PEARL ST.

PROJECT NORTH

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

FIRST FLOOR & UPPER ELEVATOR LOBBY SLAB PLAN

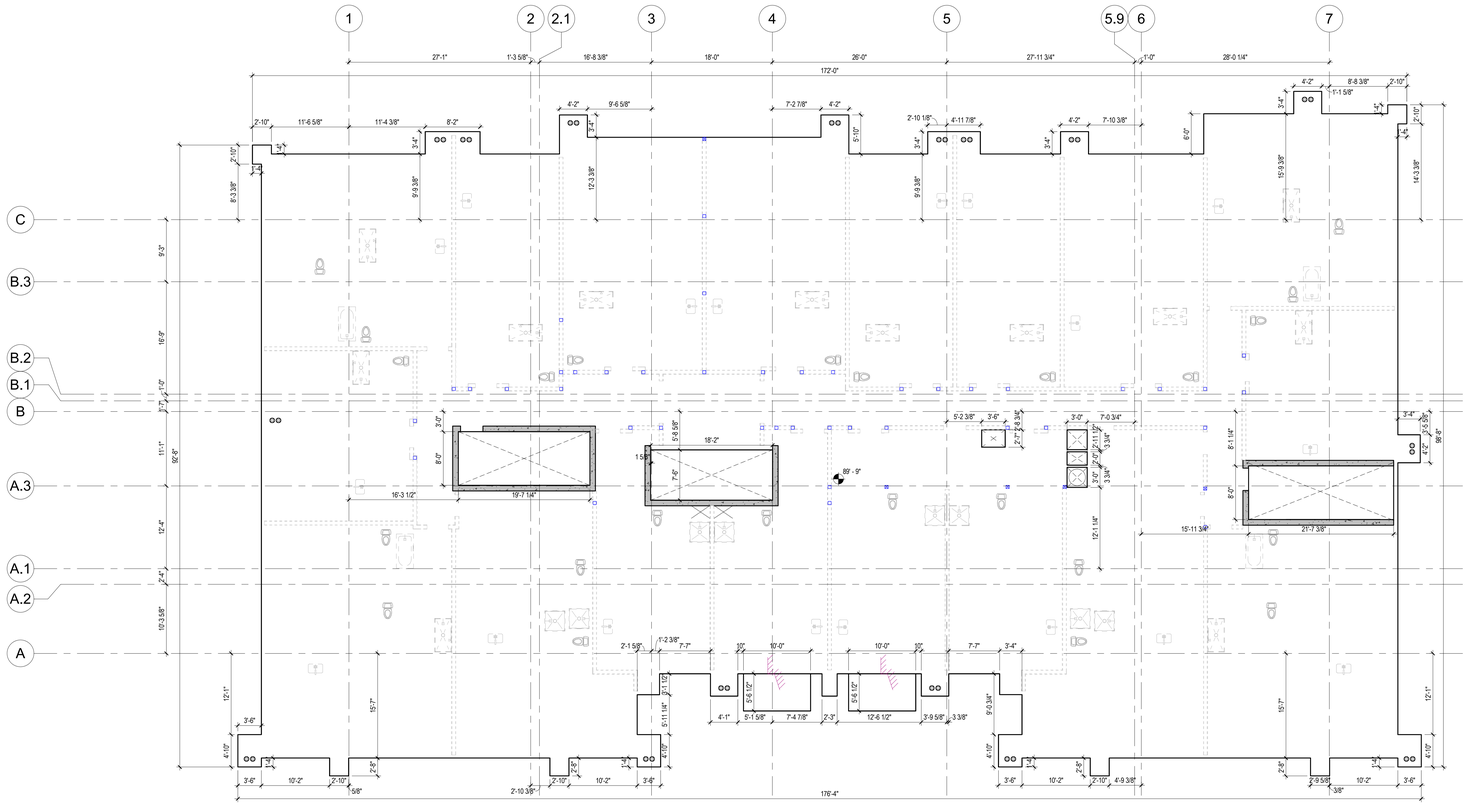
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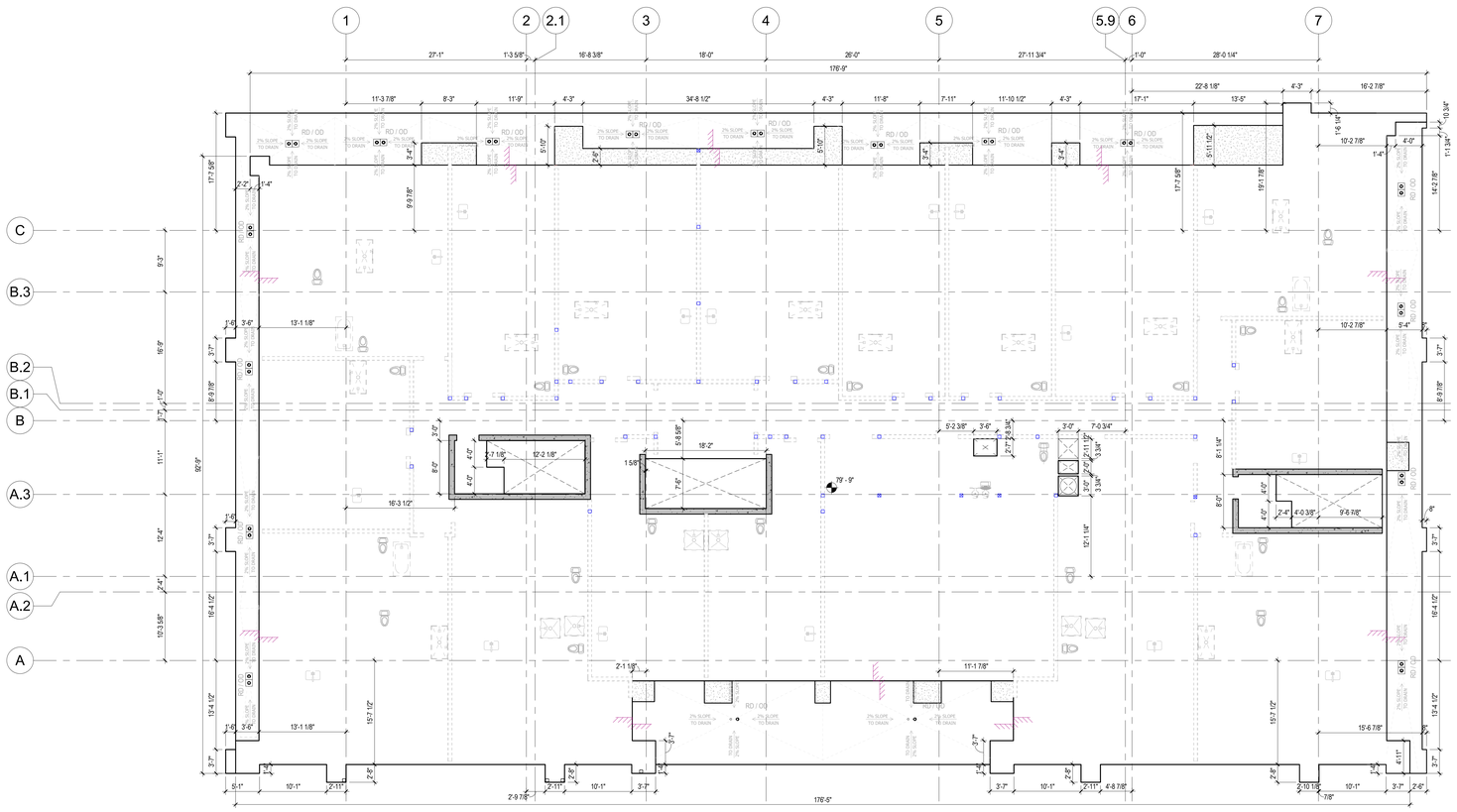
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1 A-143 TYPICAL (3RD-7TH) FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"



2 A-143 2ND FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"

SLAB EDGE PLAN GENERAL NOTES

1. GC TO REVIEW ALL FLOOR FINISHES INCLUDING ARCHITECTURAL PLANS AND INTERIOR DESIGN DRAWINGS AND PROVIDE THE REQUIRED SLAB RECESS TO ACCOMMODATE A FINISHED FLOOR WITHOUT SLOPES OR OTHER VERTICAL TRANSITIONS.
2. 1/2" SLAB STEP AND 1" TAPER FOR DRAINAGE SLOPE AT ALL ELEVATED BALCONY SLABS. REFER TO STRUCTURAL DRAWINGS AND ARCHITECTURAL DETAILS.
3. SLAB EDGE TO BE COORDINATED WITH MEP AND STRUCTURAL WORK.
4. CONTRACTOR SHALL PROVIDE COORDINATION PLANS AS REQUIRED BY SPEC SECTION 01 3100.
5. SEE STRUCTURAL DRAWINGS FOR COLUMN AND BEAM SCHEDULES.
6. DIMENSIONS ARE TO FACE OF CONCRETE, TO HOLD FACE OF COLUMNS AND TO MAIN GRID LINES.
7. SPOT ELEVATIONS INDICATE TOP OF STRUCTURAL SLAB UNLESS OTHERWISE NOTED.
8. CONTRACTOR TO COORDINATE OPENINGS IN CONCRETE WALLS FOR OPENINGS WITH SCHEDULES AND MANUFACTURERS REQUIREMENTS.
9. ARCHITECTURAL SLAB EDGE PLAN DIMENSIONS SUPERCEDE DIMENSIONS ON STRUCTURAL PLANS AND SHALL BE COORDINATED WITH ALL REMAINING ARCHITECTURAL PLANS ACCORDINGLY.
10. IF NOT DIMENSIONED, COLUMNS ARE TO BE CENTERED ON THE GRID LINE SHOWN.

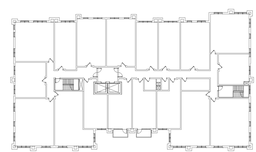
SLAB EDGE PLAN LEGEND

- SLAB OPENING
- ELEVATED BALCONY SLAB
- RAMP
- EARTH FILLING
- 1/2" DOOR NOTCH
- CONCRETE CURB ; REFER TO STRUCT DWGS
- 3'-6" HIGH CONCRETE WALL ; REFER TO STRUCT DWGS
- TOP OF SLAB ELEVATIONS
- DIRECTION OF STRUCTURAL SLAB SLOPE
- STEP IN STRUCTURAL SLAB WITH DIMENSION INDICATED
- COLUMN BELOW
- PLUMBING FIXTURE, SEE PLUMBING DWGS
- FD RD FCO — DRAINS, SEE PLUMBING DWGS
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- R D / O D — ROOF DRAIN/OVERFLOW DRAIN SLEEVE, REFER TO PLUMBING DWGS

9TH FLOOR - KEYPLAN



(3RD-8TH) FLOOR - KEYPLAN



PROJECT NORTH

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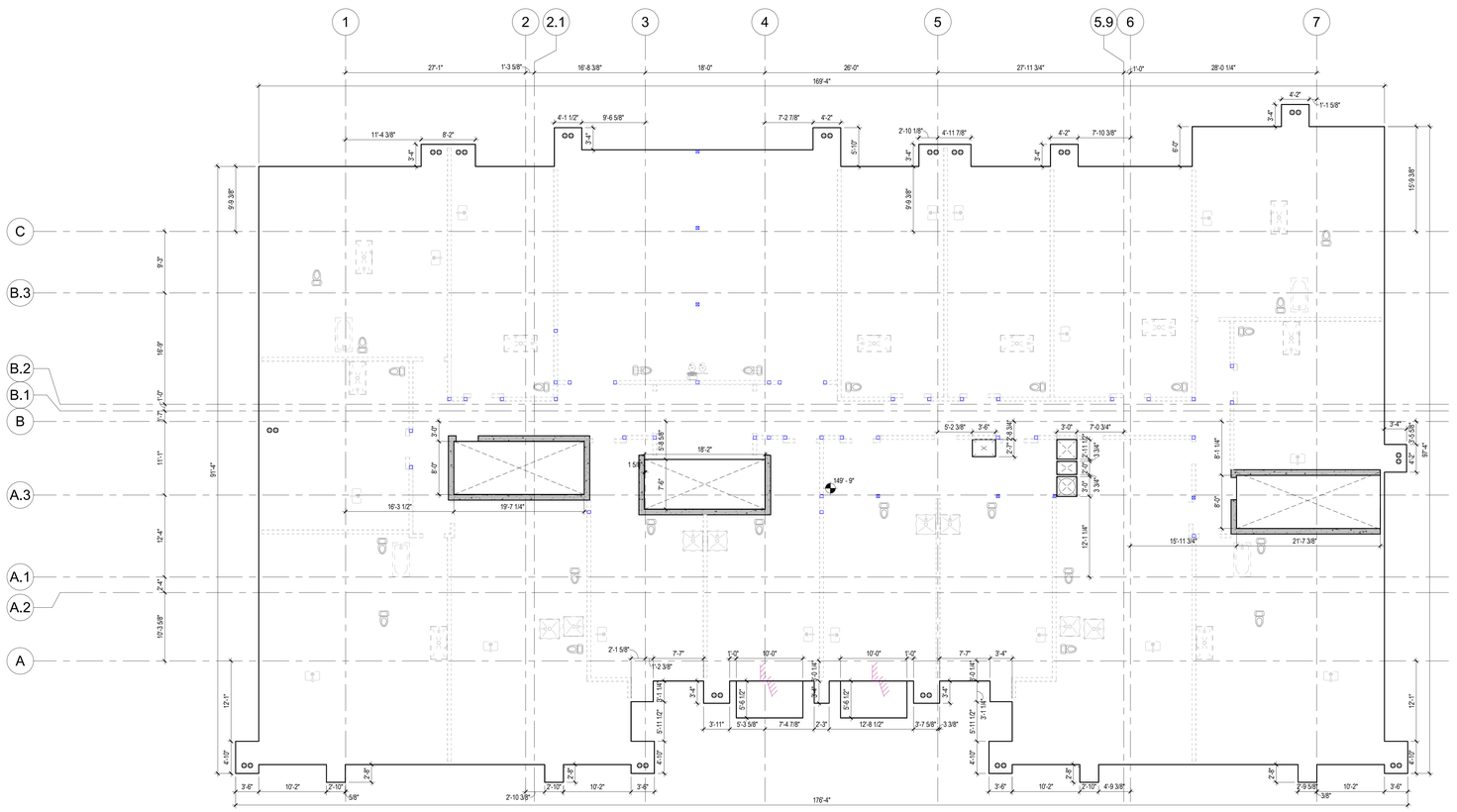
2ND & TYPICAL (3RD-7TH) SLAB PLAN

NO.	DESCRIPTION	DATE
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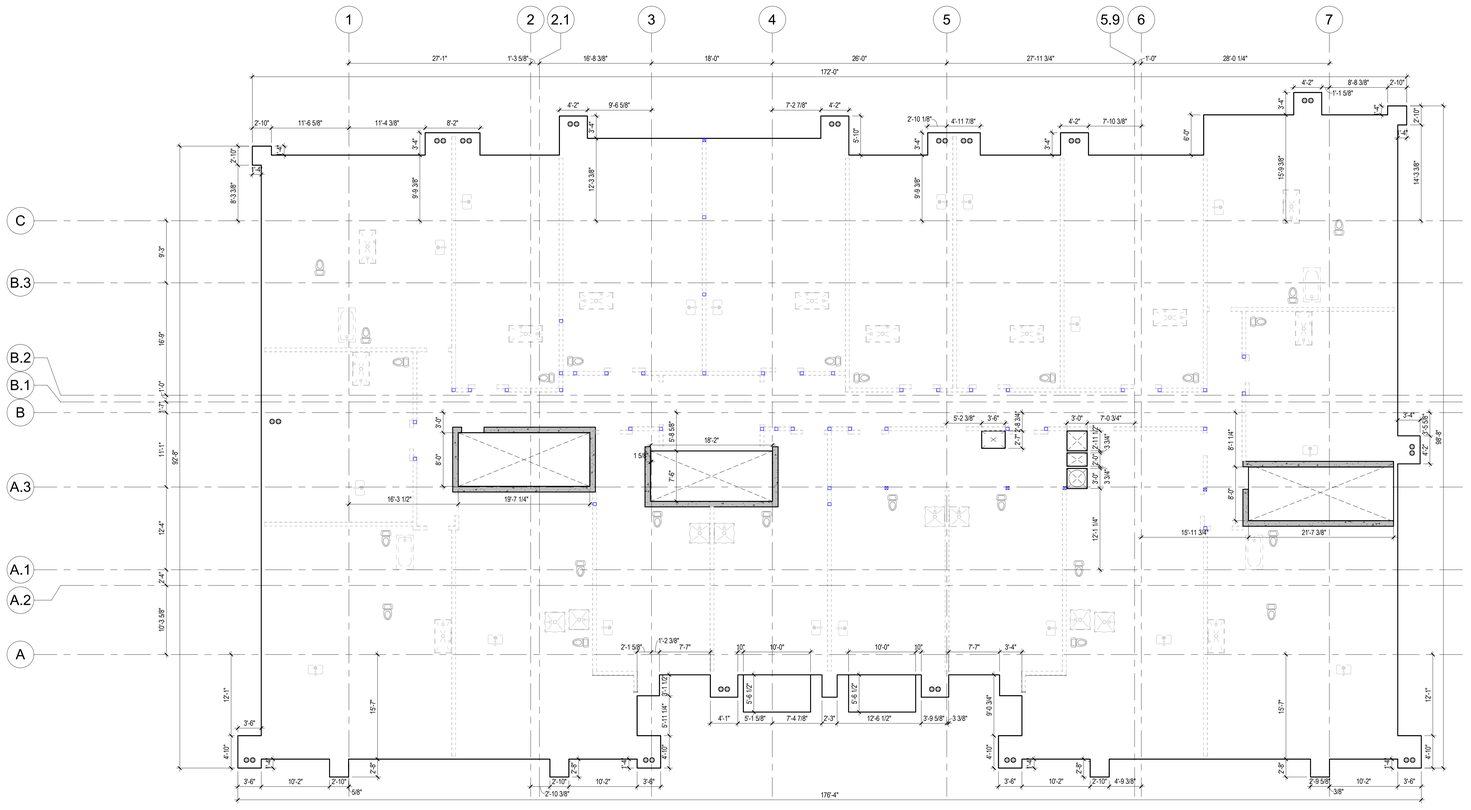
A-143

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2 A-144 9TH FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"



1 A-144 8TH FLOOR SLAB PLAN

Scale: 1/8" = 1'-0"

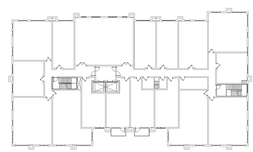
SLAB EDGE PLAN GENERAL NOTES

1. GC TO REVIEW ALL FLOOR FINISHES INCLUDING ARCHITECTURAL PLANS AND INTERIOR DESIGN DRAWINGS AND PROVIDE THE REQUIRED SLAB RECESS TO ACCOMMODATE A FINISHED FLOOR WITHOUT SLOPES OR OTHER VERTICAL TRANSITIONS.
2. 1/2" SLAB STEP AND 1" TAPER FOR DRAINAGE SLOPE AT ALL ELEVATED BALCONY SLABS. REFER TO STRUCTURAL DRAWINGS AND ARCHITECTURAL DETAILS.
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4. CONTRACTOR SHALL PROVIDE COORDINATION PLANS AS REQUIRED BY SPEC SECTION 01 3100.
5. SEE STRUCTURAL DRAWINGS FOR COLUMN AND BEAM SCHEDULES.
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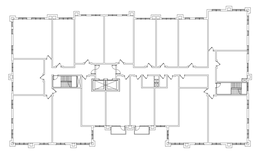
SLAB EDGE PLAN LEGEND

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- ELEVATED BALCONY SLAB
- RAMP
- EARTH FILLING
- 1/2" DOOR NOTCH
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- DIRECTION OF STRUCTURAL SLAB SLOPE
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- R D / O D — ROOF DRAIN/OVERFLOW DRAIN SLEEVE, REFER TO PLUMBING DWGS

9TH FLOOR - KEYPLAN



(3RD-8TH) FLOOR - KEYPLAN



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Port Chester, NY 10573

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8TH & 9TH SLAB PLAN

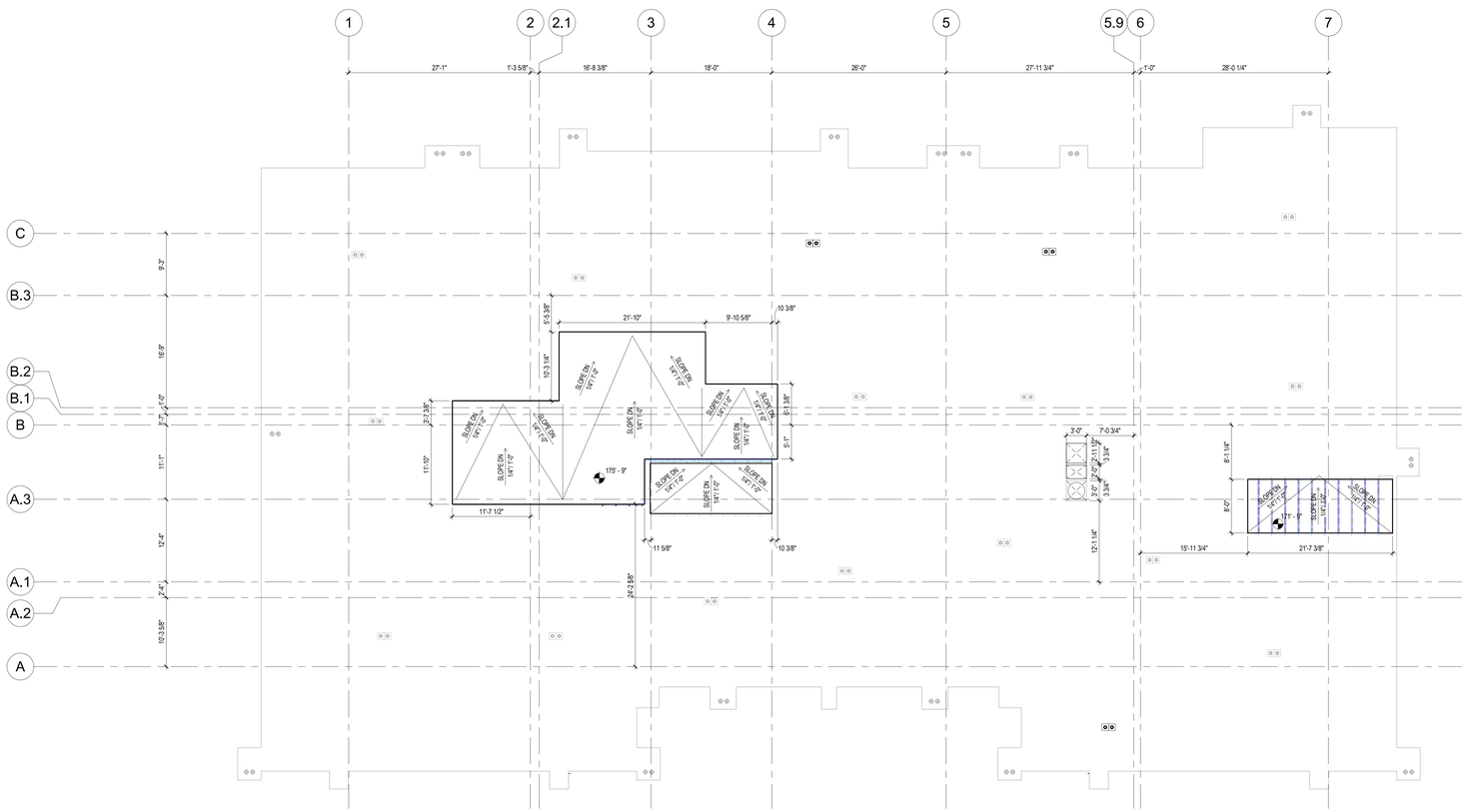
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	25% DD SUBMISSION	12/13/24

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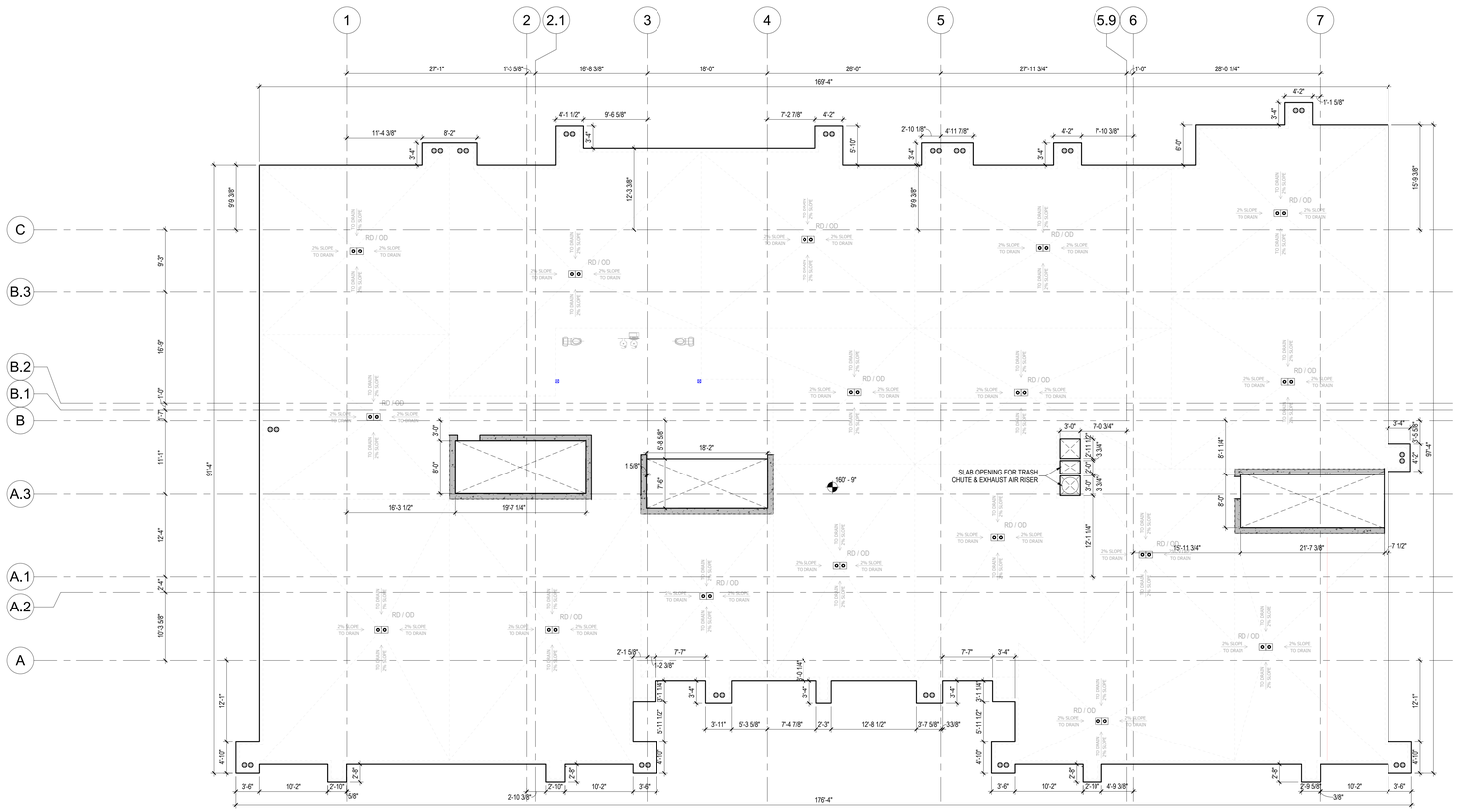
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2 A-145 PENTHOUSE ROOF SLAB PLAN

Scale: 1/8" = 1'-0"



1 A-145 BUILDING ROOF SLAB PLAN

Scale: 1/8" = 1'-0"

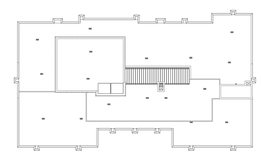
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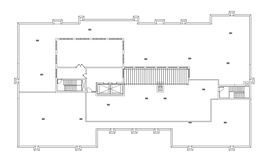
SLAB EDGE PLAN LEGEND

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- ELEVATED BALCONY SLAB
- RAMP
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- 3'-6" HIGH CONCRETE WALL ; REFER TO STRUCT DWGS
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- DIRECTION OF STRUCTURAL SLAB SLOPE
- STEP IN STRUCTURAL SLAB WITH DIMENSION INDICATED
- COLUMN BELOW
- PLUMBING FIXTURE, SEE PLUMBING DWGS
- FD RD FCO — DRAINS, SEE PLUMBING DWGS
- TD
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  GC TO COORDINATE WITH MECH. DWGS. CORE DRILL OF SLEEVE LOCATIONS IN AREA ASSIGNED. FIRE SAF PENETRATIONS THROUGH FLOOR TO MAINTAIN ASSEMBLY RATING.
  FOR EXTENT OF SLEEVE LOCATIONS, REFER TO 400'S SERIES UNIT PLANS.
- RD / OD — ROOF DRAIN/OVERFLOW DRAIN SLEEVE, REFER TO PLUMBING DWGS

PENTHOUSE - KEYPLAN



ROOF - KEYPLAN



PROJECT NORTH

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

BUILDING ROOF & PENTHOUSE ROOF SLAB PLAN

NO.	DESCRIPTION	DATE
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1
2
2.1
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5 A-313
3 A-313
2 A-313
3 A-312
2 A-312
4 A-311
3 A-311
2 A-311
M-04
M-01.1
M-04.1
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M-06
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M-03
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M-04
M-01.1
SE 41
SE 02
SE 03
W2
W3
W3B
W2B
W3A
W2A
W4
W5
L01
L02
GS 01
GS 01a
GS 02
GS 02a
GS 03
LOCATION OF GAS METERS
PENTHOUSE ROOF 171' - 9"
BUILDING ROOF 161' - 9"
9TH FLOOR 149' - 9"
8TH FLOOR 139' - 9"
7TH FLOOR 129' - 9"
6TH FLOOR 119' - 9"
5TH FLOOR 109' - 9"
4TH FLOOR 99' - 9"
3RD FLOOR 89' - 9"
2ND FLOOR 79' - 9"
AVG. GRADE 57' - 10 1/2"
1ST FLOOR 57' - 9"
CELLAR 1 53' - 4"
CELLAR 2 47' - 3"
10'-0"
10'-0"
10'-0



1 A-202 WEST ELEVATION
Scale: 1/8" = 1'-0"

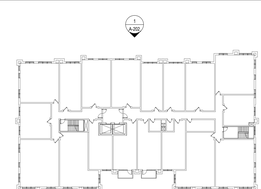
GENERAL ELEVATION NOTES

1. REFER TO FLOOR PLANS FOR WINDOW TAGS.

MATERIAL SCHEDULE

NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

ARCHITECT:
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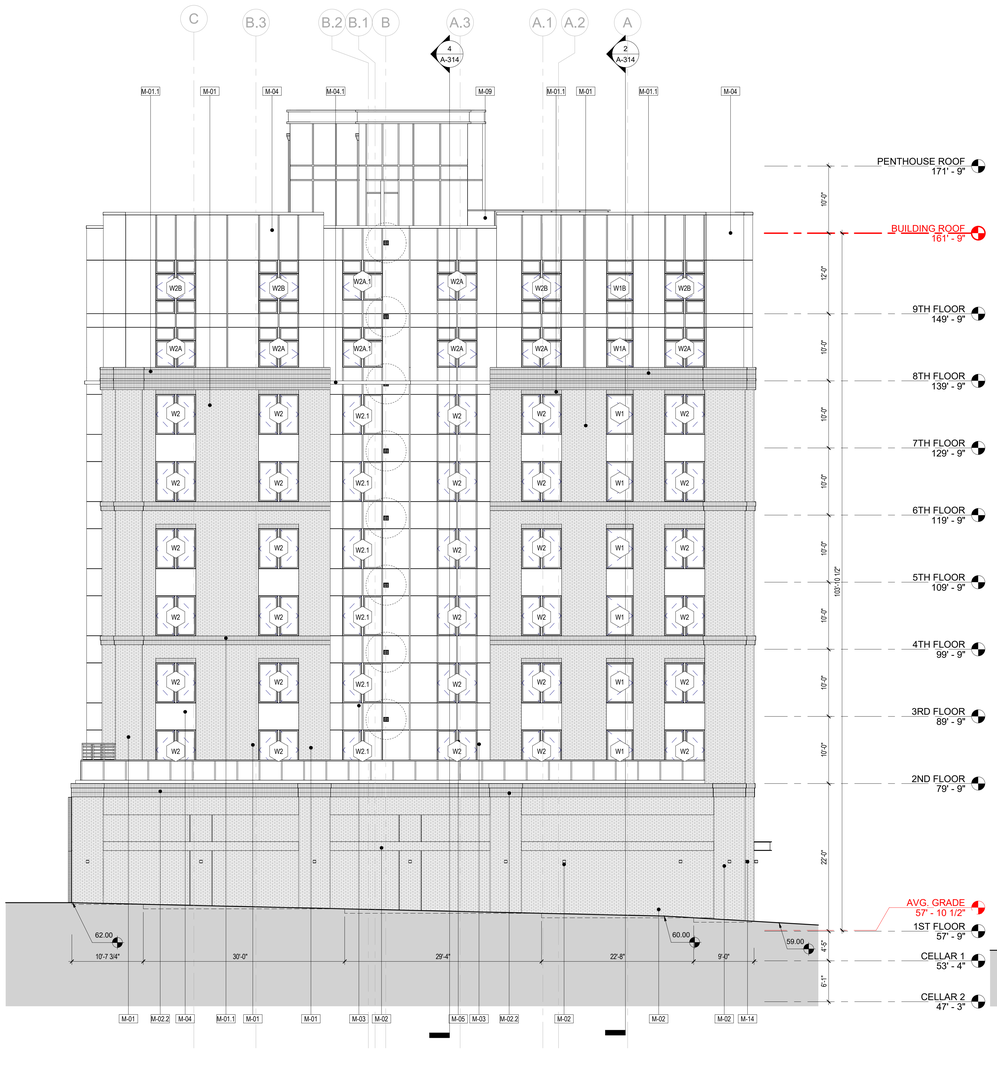
WEST ELEVATION

NO.	DESCRIPTION	DATE
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2 A-203 SOUTH ELEVATION (DD/CD)
Scale: 1/8" = 1'-0"

1 A-203 NORTH ELEVATION (DD/CD)
Scale: 1/8" = 1'-0"

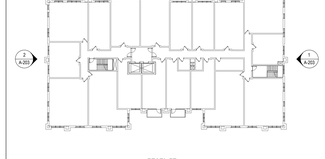
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1. REFER TO FLOOR PLANS FOR WINDOW TAGS.

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M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

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NORTH / SOUTH ELEVATION

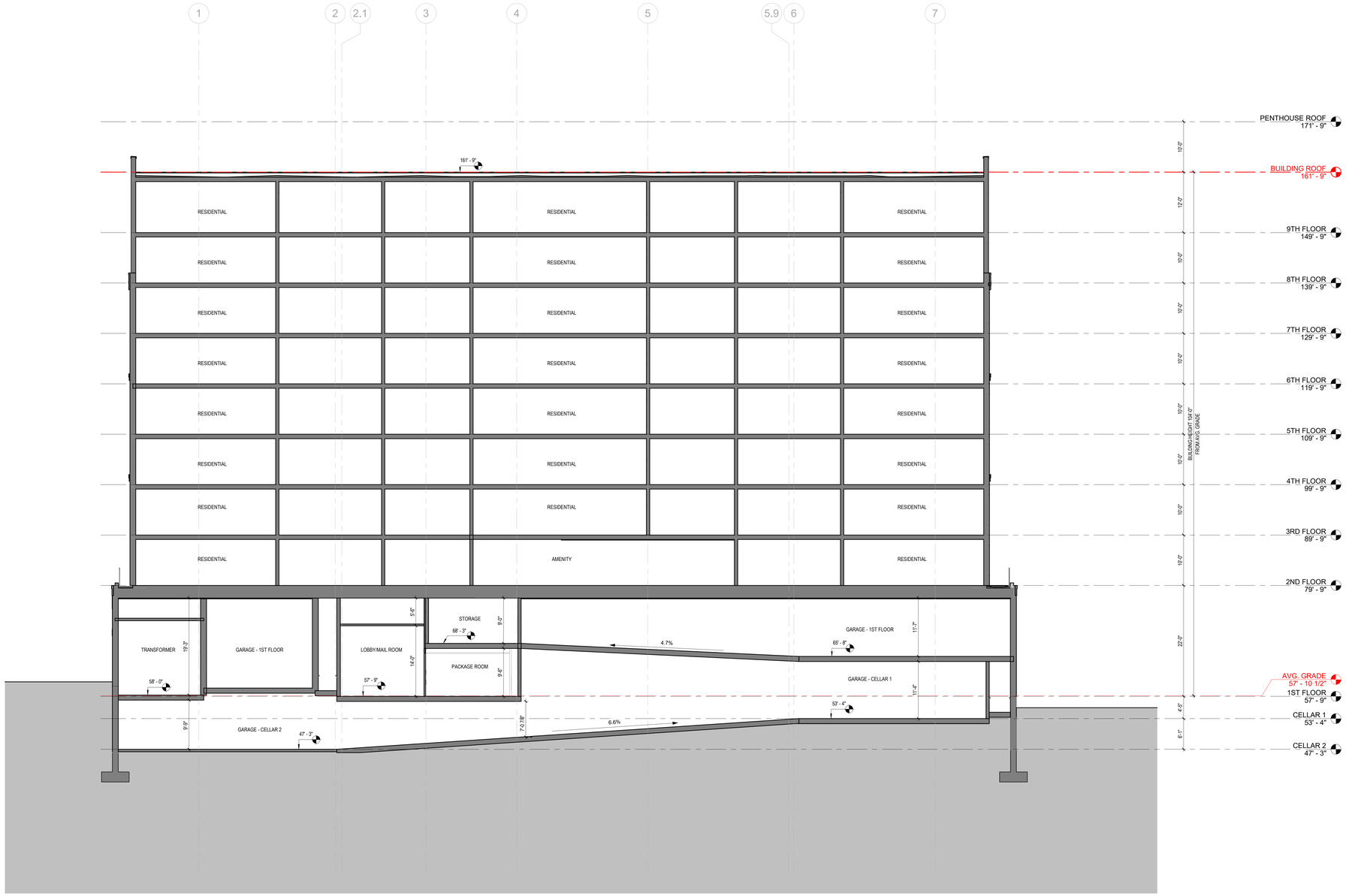
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A-203

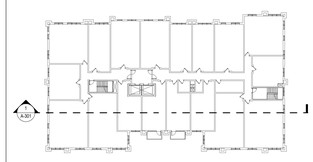
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1 A-301 BUILDING SECTION 1
Scale: 1/8" = 1'-0"

KEYPLAN



PEARL ST.

PROJECT NORTH

ARCHITECT:
lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

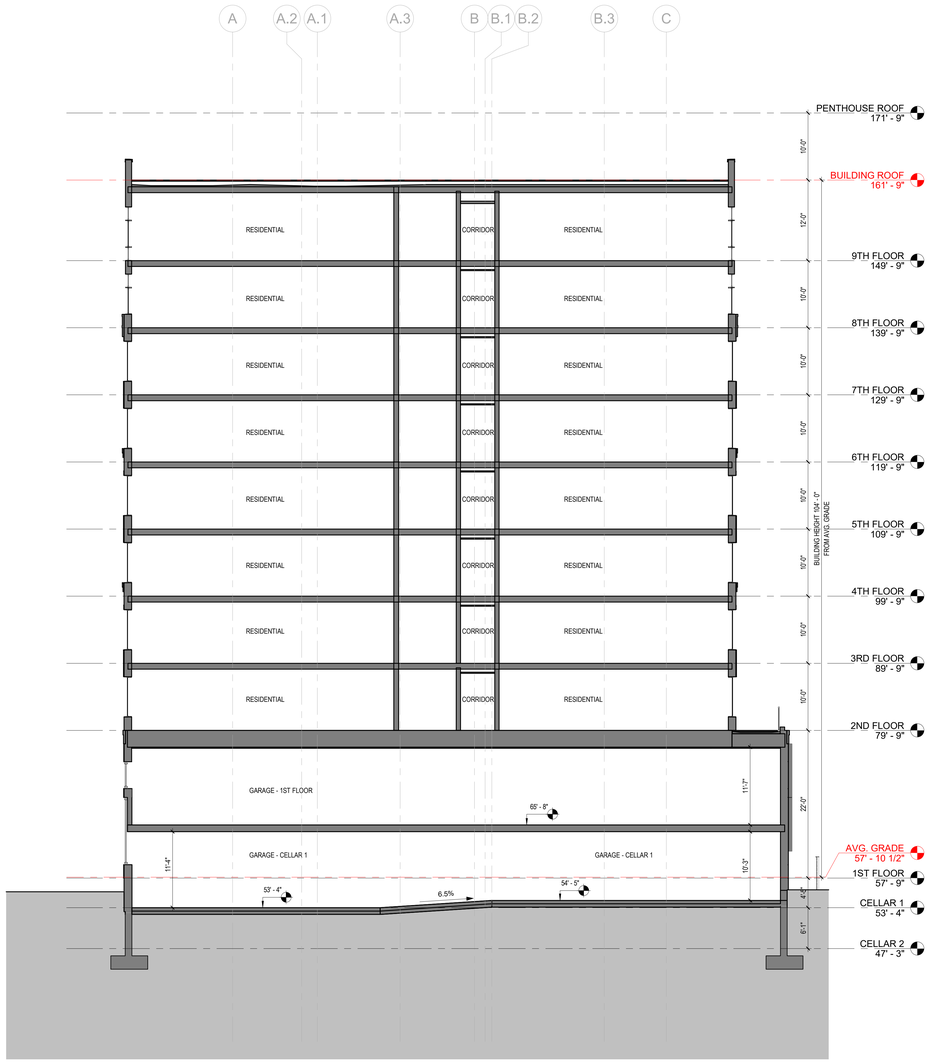
BUILDING SECTION

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:00:04 AM
FILE NAME:

A-301

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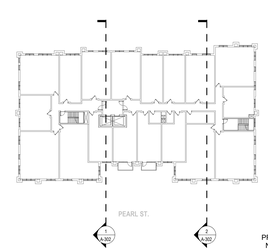


2 A-302 BUILDING SECTION 3
Scale: 1/8" = 1'-0"



1 A-302 BUILDING SECTION 2
Scale: 1/8" = 1'-0"

KEYPLAN



PROJECT NORTH

ARCHITECT:
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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

BUILDING SECTION

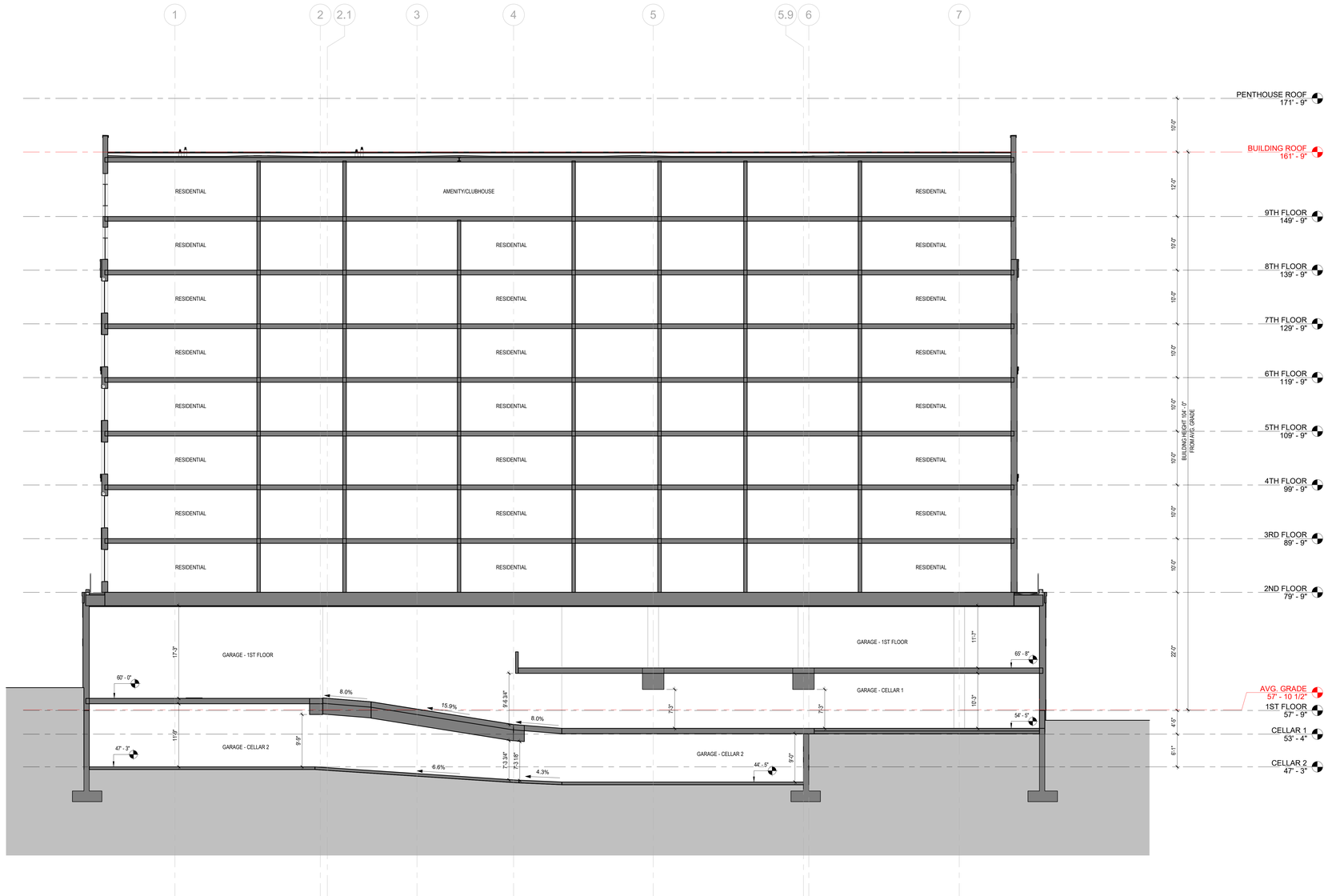
NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:00:06 AM
FILE NAME:

A-302

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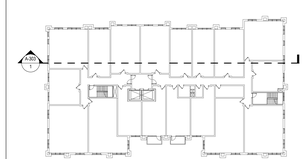
Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/SAC001A - ARCH - 28 Pearl Street.rvt



1 A-303 BUILDING SECTION 4

Scale: 1/8" = 1'-0"

KEYPLAN



PEARL ST.

PROJECT NORTH

ARCHITECT:

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

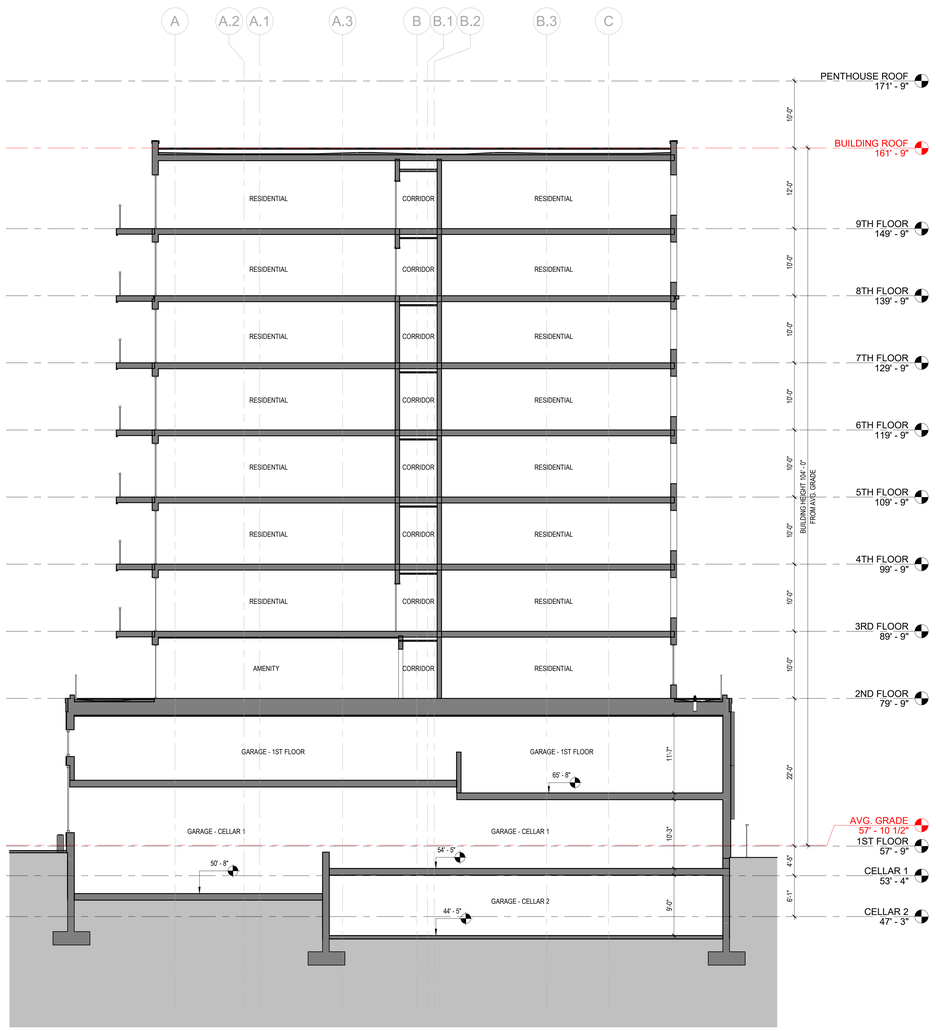
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NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

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CHECKED BY: Checker
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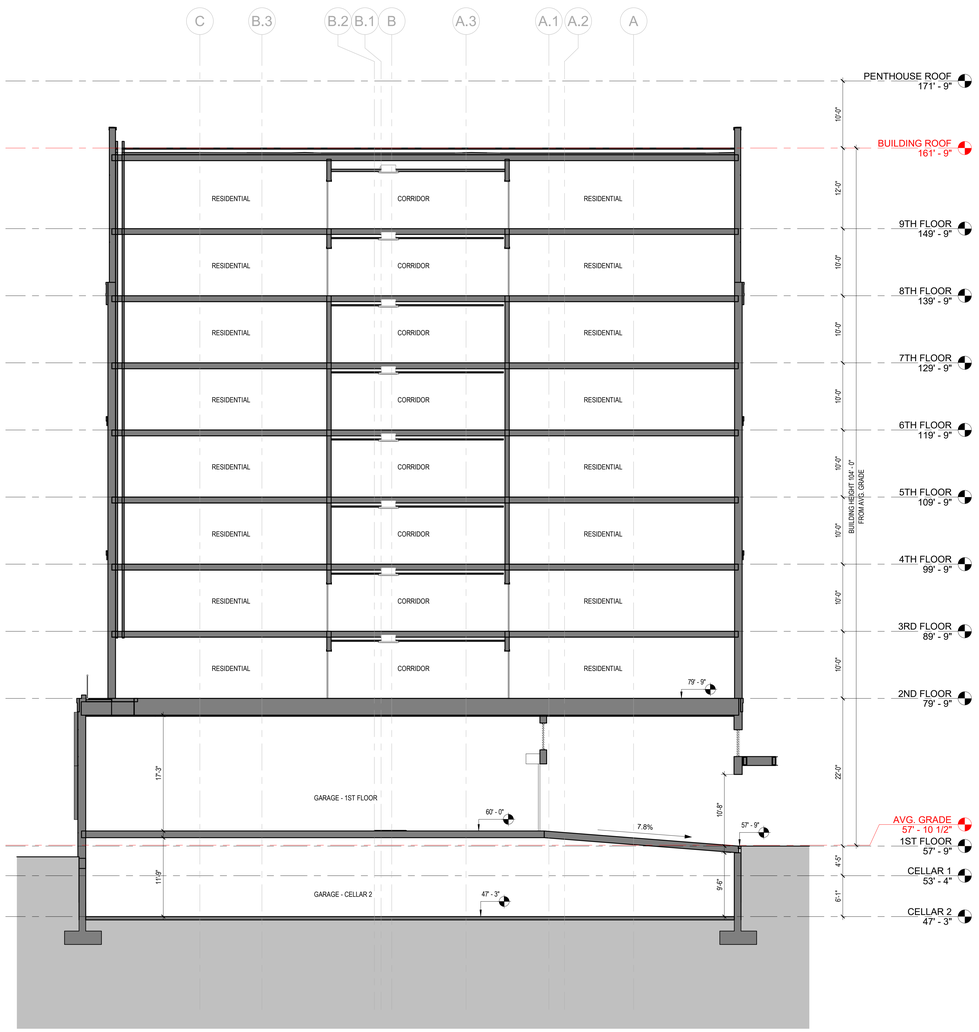
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Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/SAC001A - ARCH - 28 Pearl Street.rvt



2 A-304 BUILDING SECTION 6

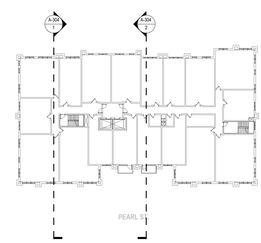
Scale: 1/8" = 1'-0"



1 A-304 BUILDING SECTION 5

Scale: 1/8" = 1'-0"

KEYPLAN



PROJECT NORTH

ARCHITECT:

lessard
DESIGN INC. P.C.

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

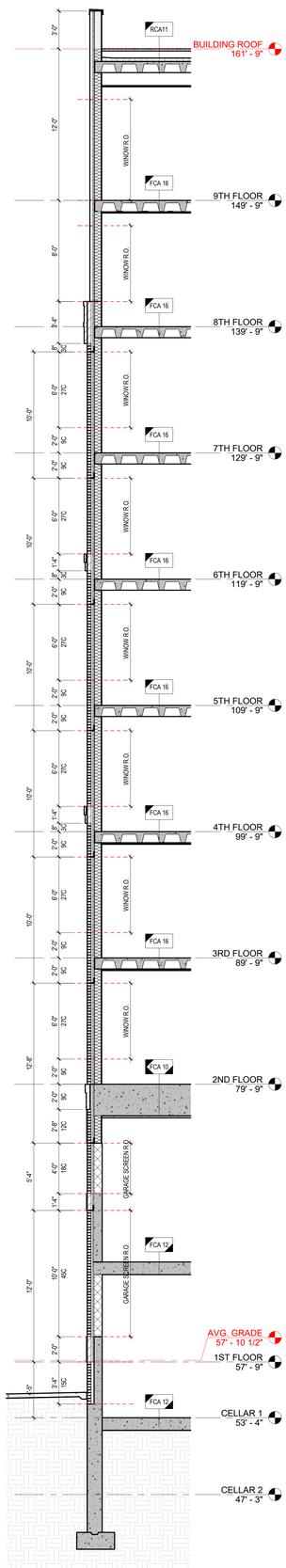
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	25% DD SUBMISSION	12/13/24

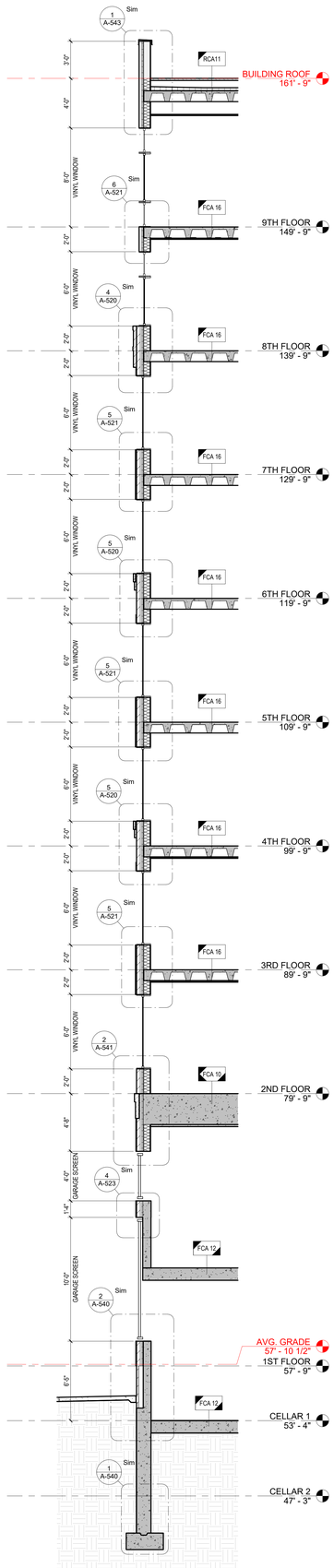
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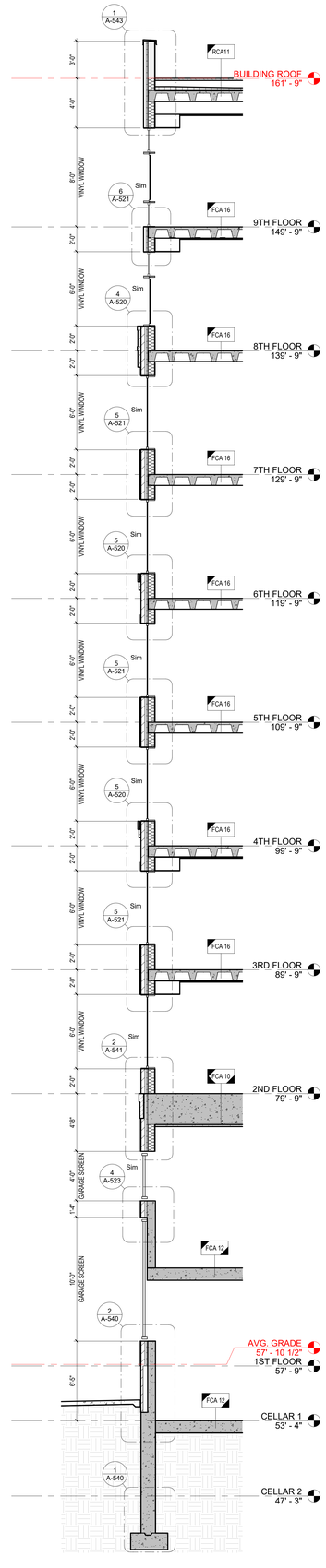
Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/SAC001A - ARCH - 28 Pearl Street.rvt



4 A-311 WALL SECTION
Scale: 1/4" = 1'-0"



3 A-311 WALL SECTION
Scale: 1/4" = 1'-0"



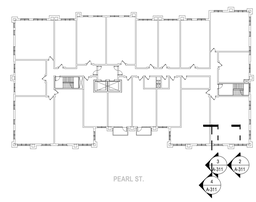
2 A-311 WALL SECTION
Scale: 1/4" = 1'-0"



1 A-311 PARTIAL ELEVATION - PEARL STREET
Scale: 1/4" = 1'-0"

MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

ARCHITECT:
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28 Pearl Street
PORT CHESTER, NY

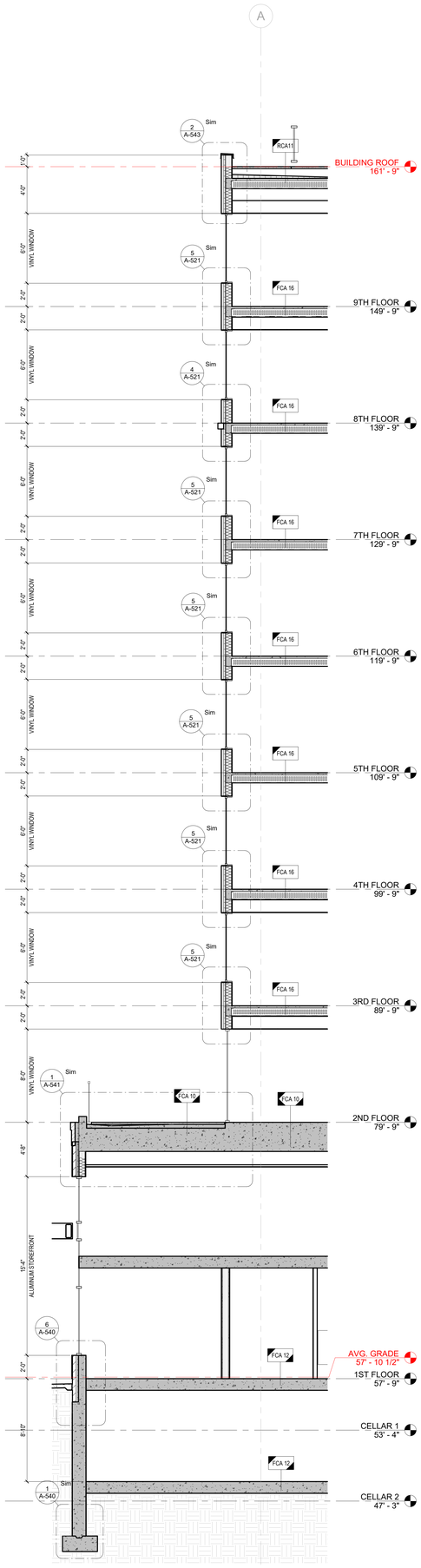
BUILDING WALL SECTIONS

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/12/24

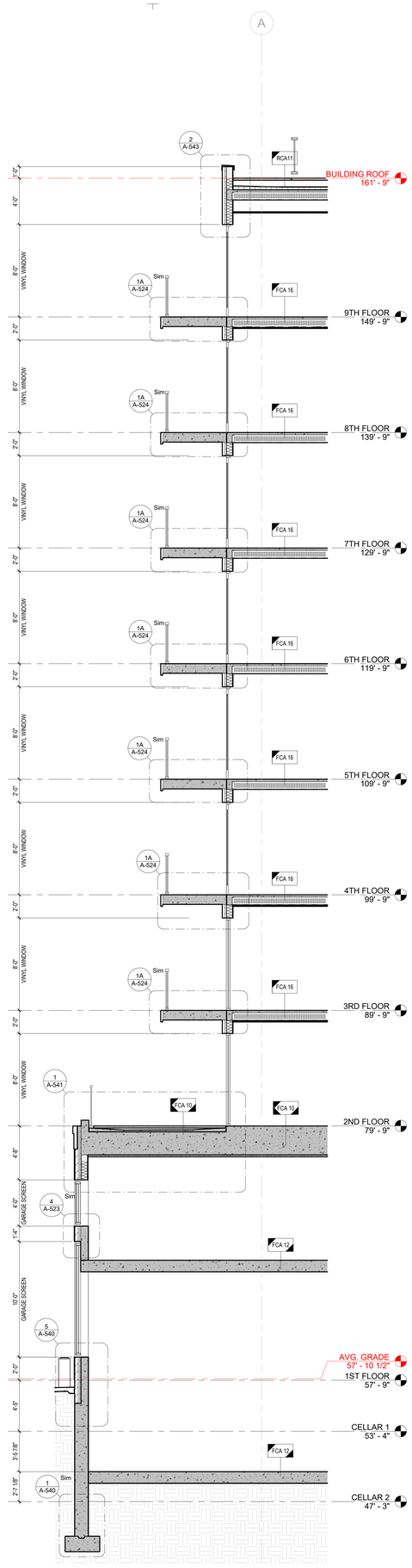
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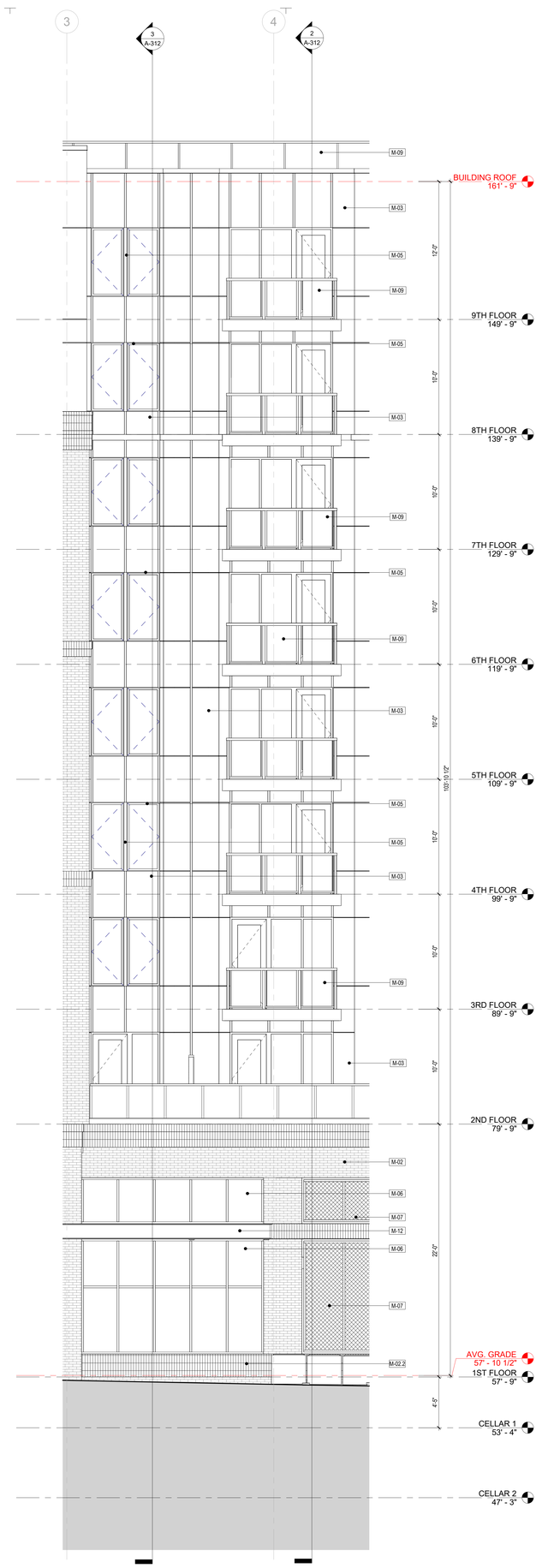
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3 A-312 WALL SECTION
Scale: 1/4" = 1'-0"



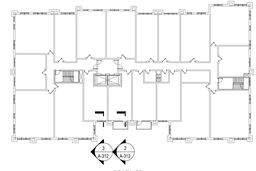
2 A-312 WALL SECTION
Scale: 1/4" = 1'-0"



1 A-312 PARTIAL ELEVATION - PEARL STREET
Scale: 1/4" = 1'-0"

MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

ARCHITECT:
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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

BUILDING WALL SECTIONS

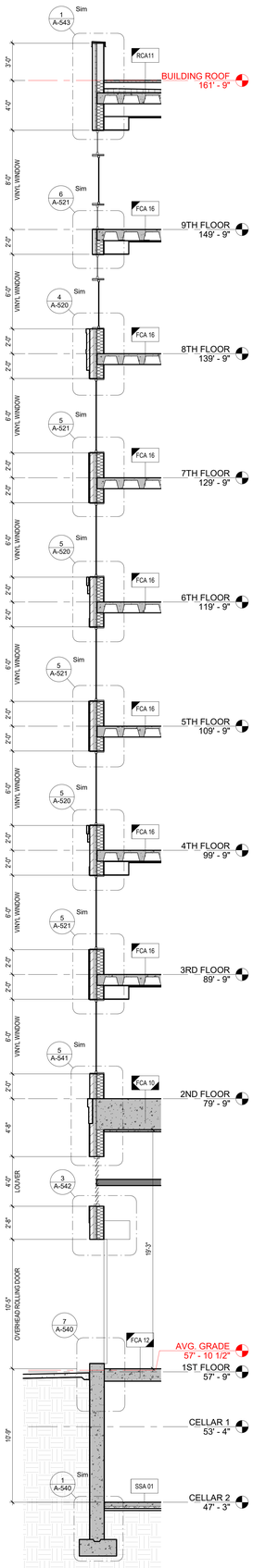
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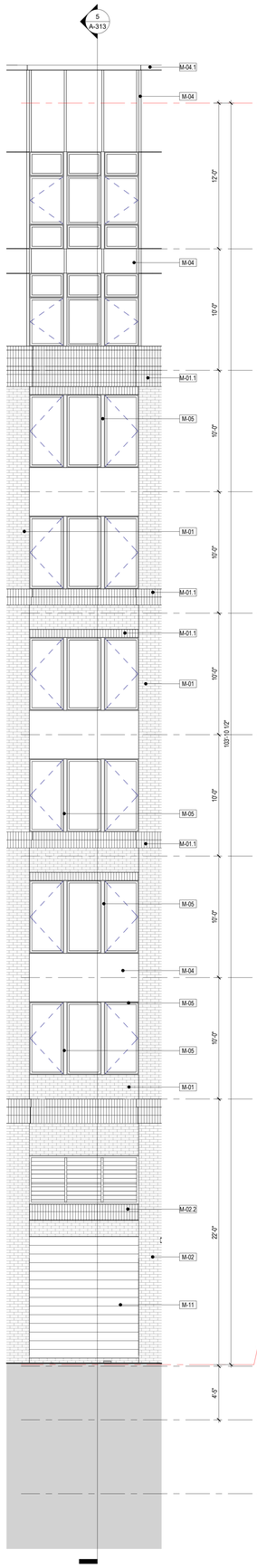
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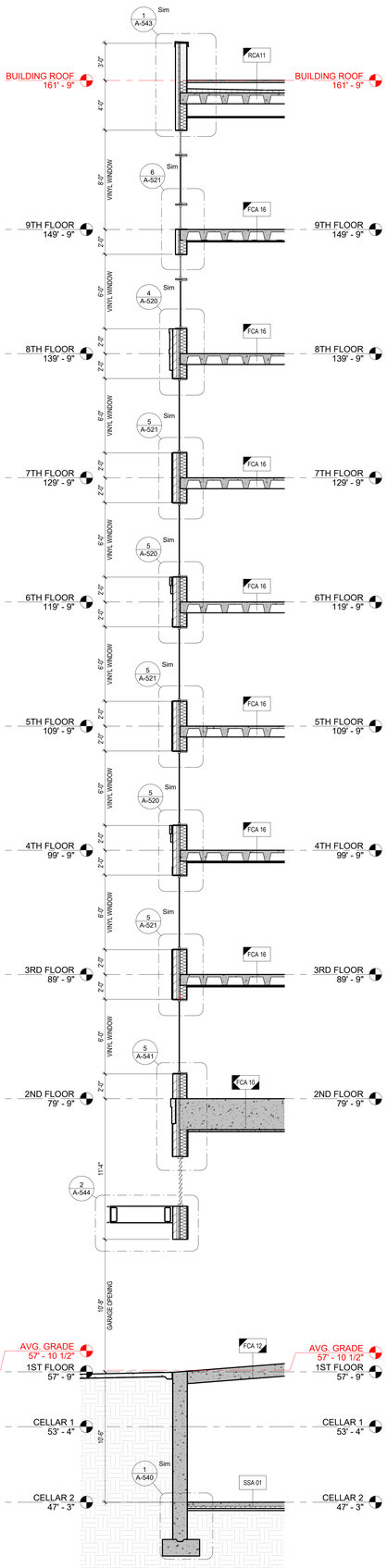
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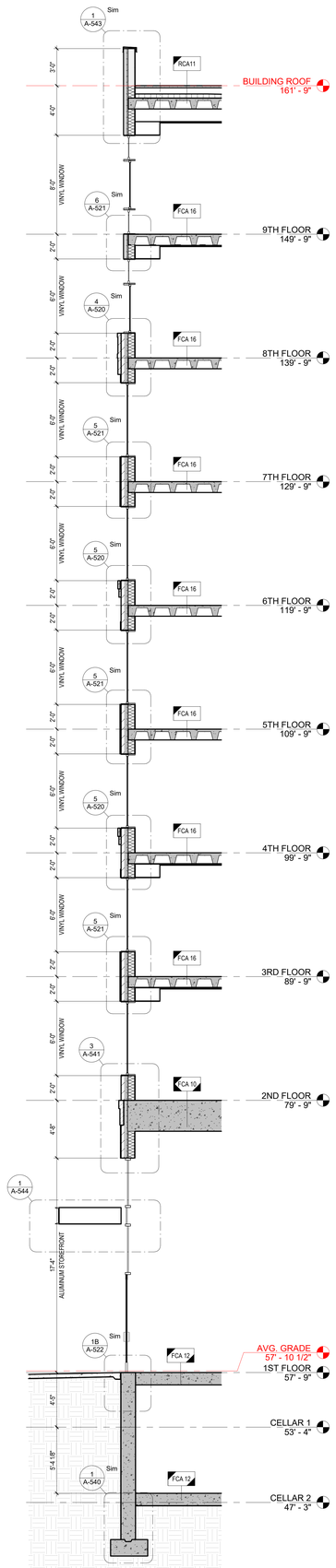
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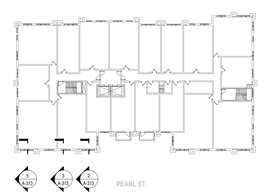






MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

5 A-313 WALL SECTION
Scale: 1/4" = 1'-0"

4 A-313 PARTIAL ELEVATION - PEARL STREET
Scale: 1/4" = 1'-0"

3 A-313 WALL SECTION
Scale: 1/4" = 1'-0"

2 A-313 WALL SECTION
Scale: 1/4" = 1'-0"

1 A-313 PARTIAL ELEVATION - PEARL STREET
Scale: 1/4" = 1'-0"

ARCHITECT:
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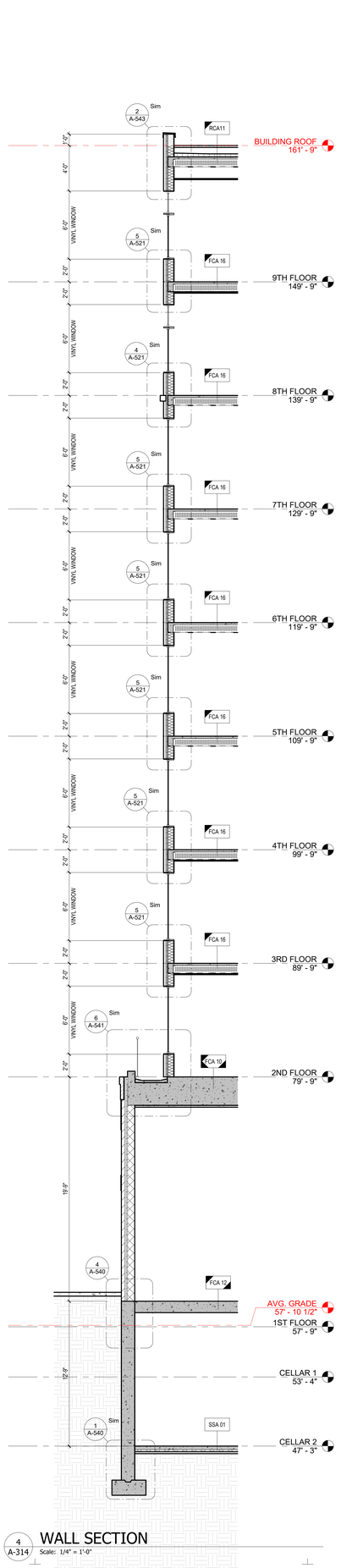
BUILDING WALL SECTIONS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	20% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 11:53:25 AM
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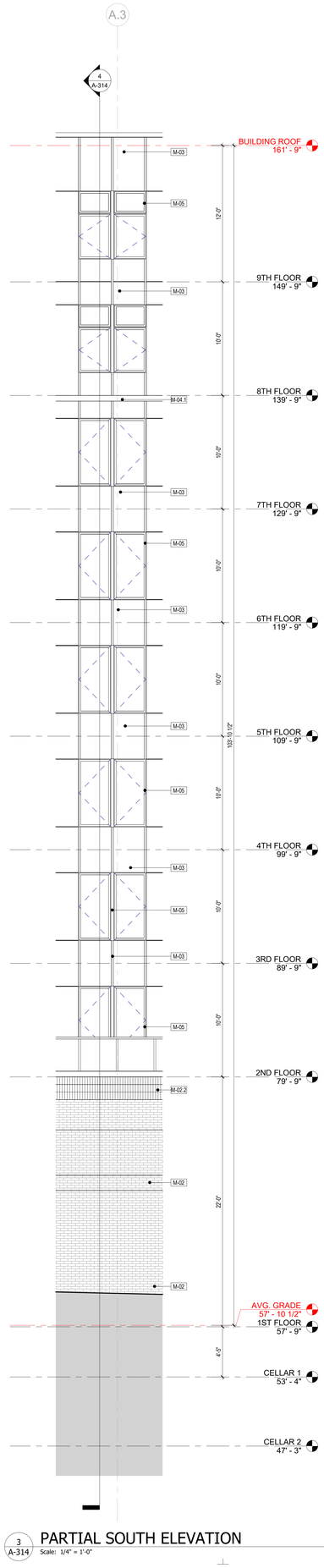
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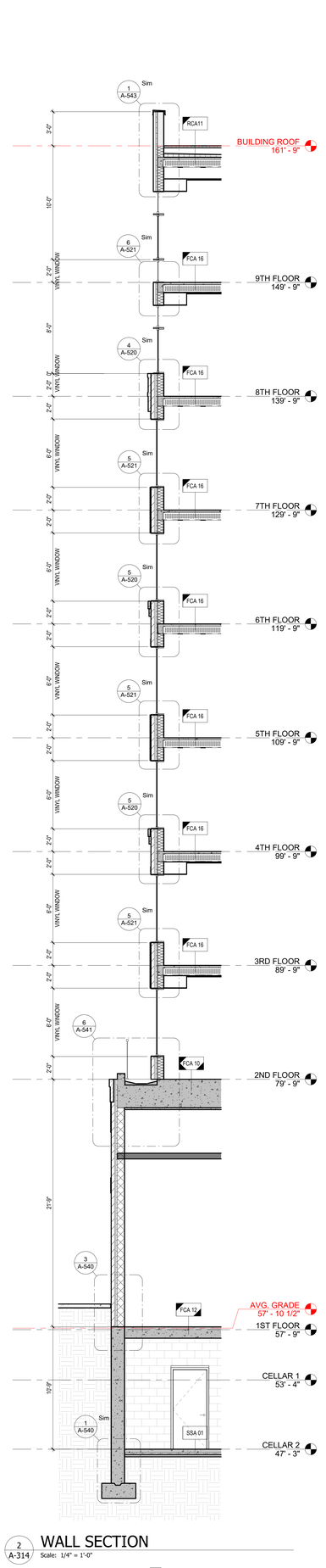


4 A-314 WALL SECTION
Scale: 1/4" = 1'-0"

A.3

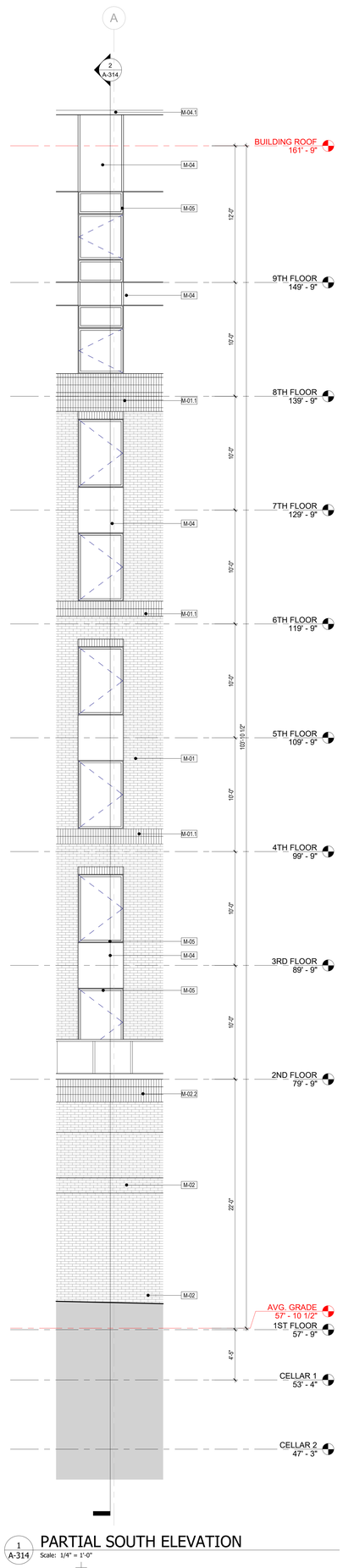


3 A-314 PARTIAL SOUTH ELEVATION
Scale: 1/4" = 1'-0"



2 A-314 WALL SECTION
Scale: 1/4" = 1'-0"

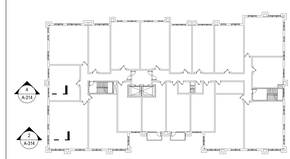
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1 A-314 PARTIAL SOUTH ELEVATION
Scale: 1/4" = 1'-0"

MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

ARCHITECT:
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28 Pearl Street
PORT CHESTER, NY

BUILDING WALL SECTIONS

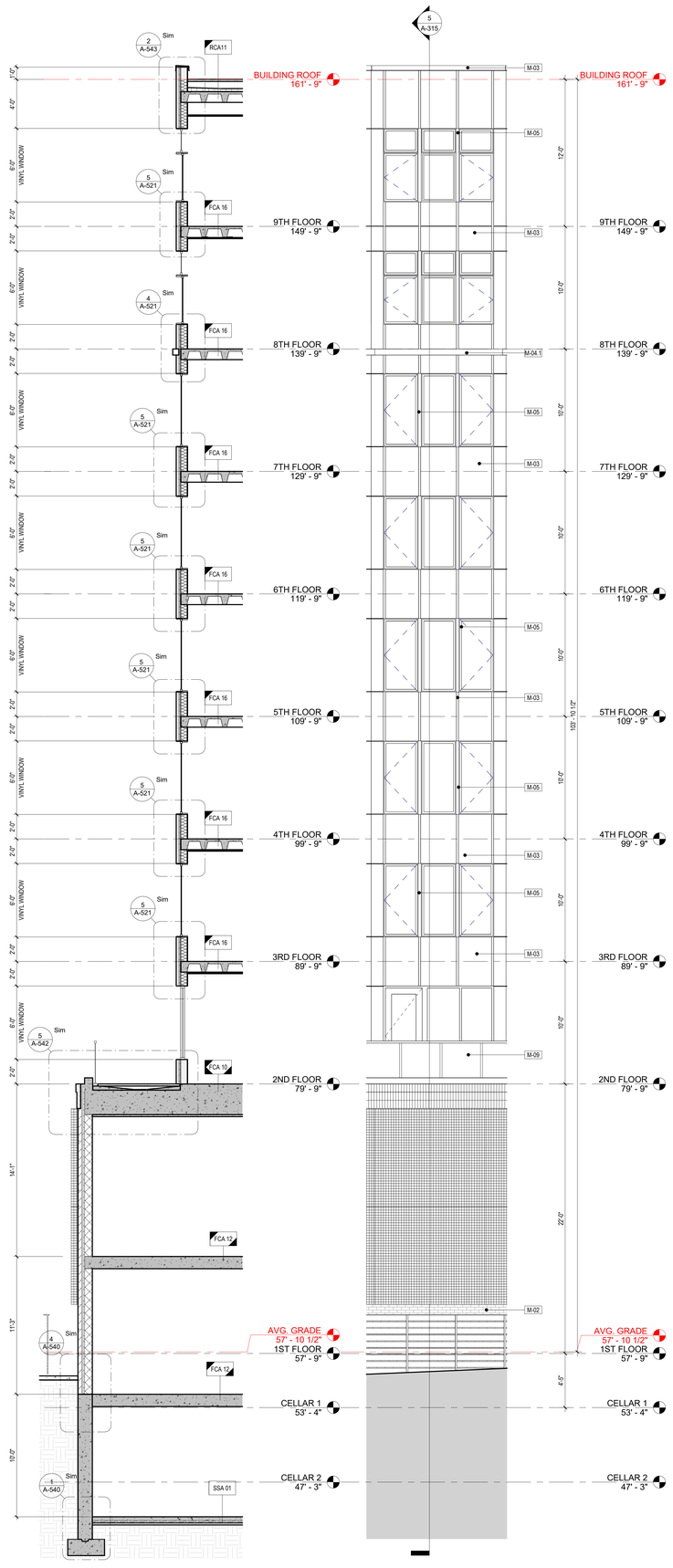
NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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CHECKED BY: Checker
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A-314

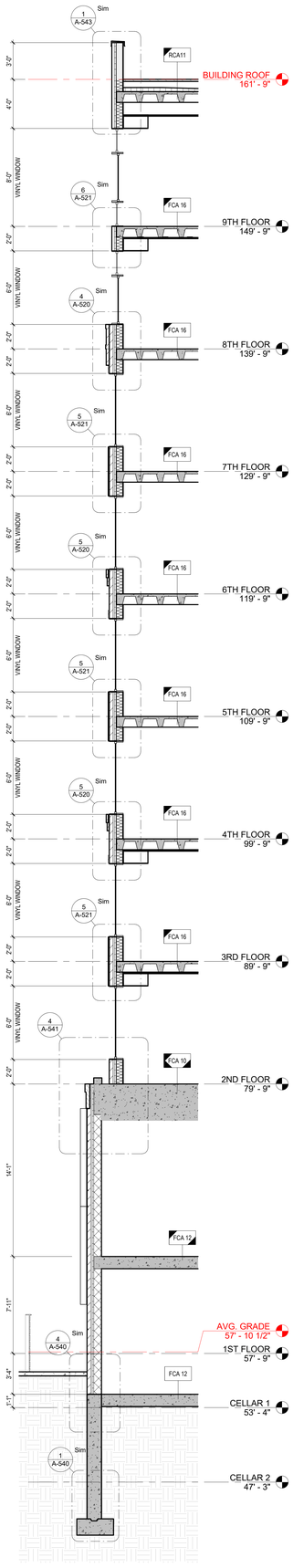
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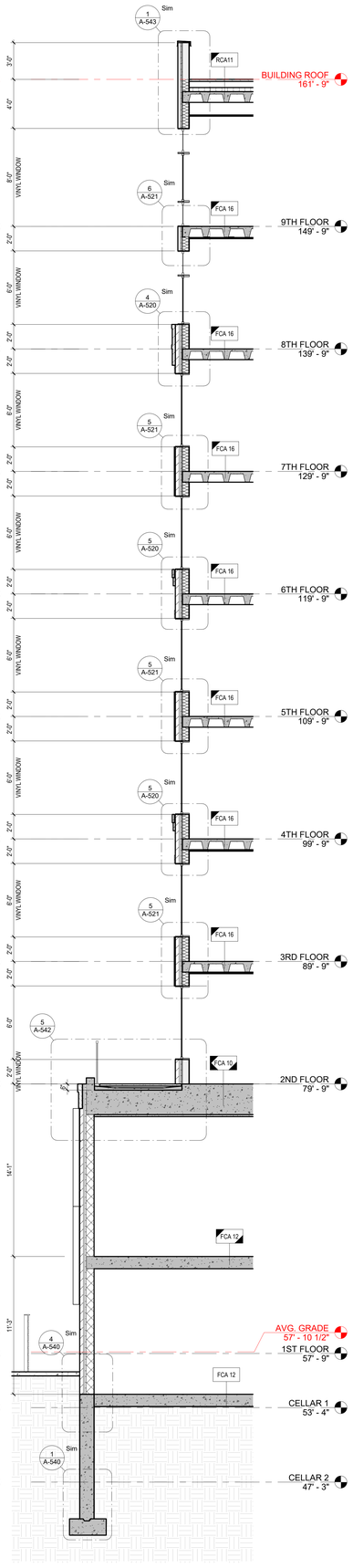


5 A-315 WALL SECTION
Scale: 1/4" = 1'-0"

4 A-315 PARTIAL WEST ELEVATION
Scale: 1/4" = 1'-0"



3 A-315 WALL SECTION
Scale: 1/4" = 1'-0"



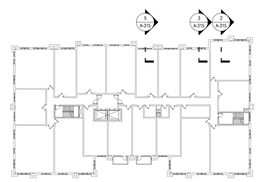
2 A-315 WALL SECTION
Scale: 1/4" = 1'-0"



1 A-315 PARTIAL WEST ELEVATION
Scale: 1/4" = 1'-0"

MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



PROJECT NORTH

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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

BUILDING WALL SECTIONS

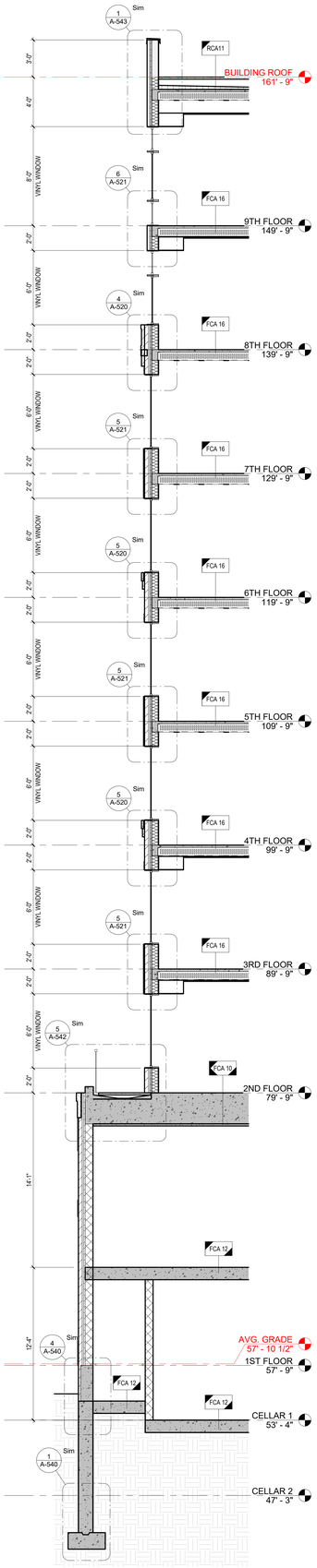
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	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG-0028
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CHECKED BY: Checker
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A-315

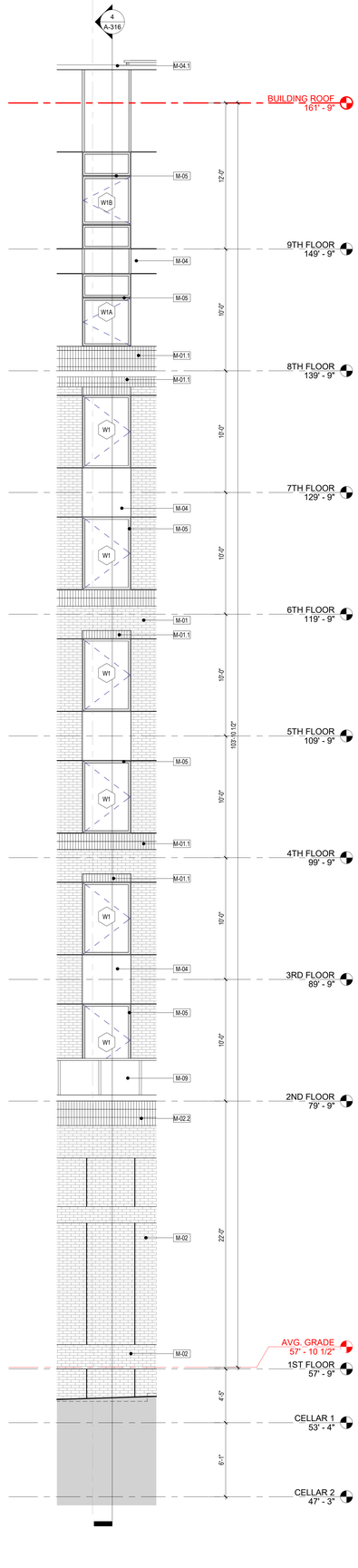
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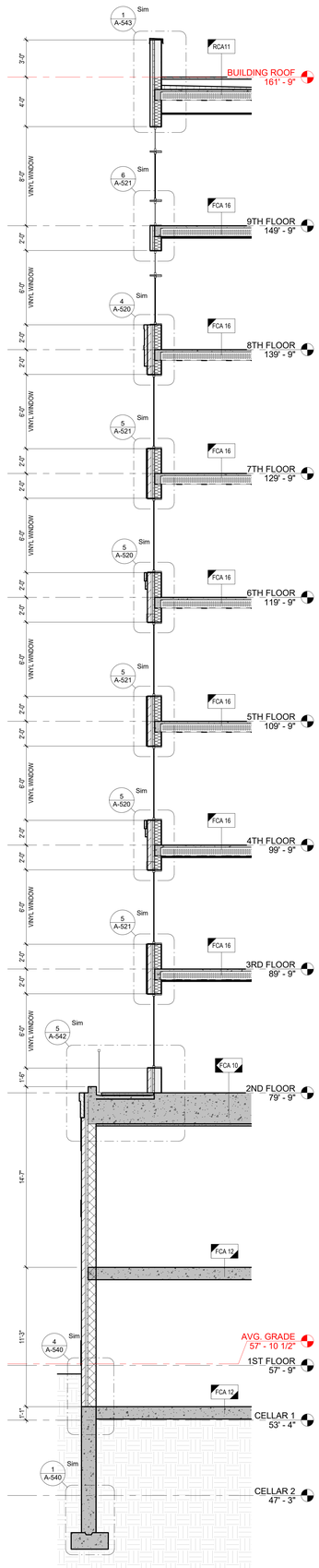
4 A-316 WALL SECTION
Scale: 1/4" = 1'-0"

A

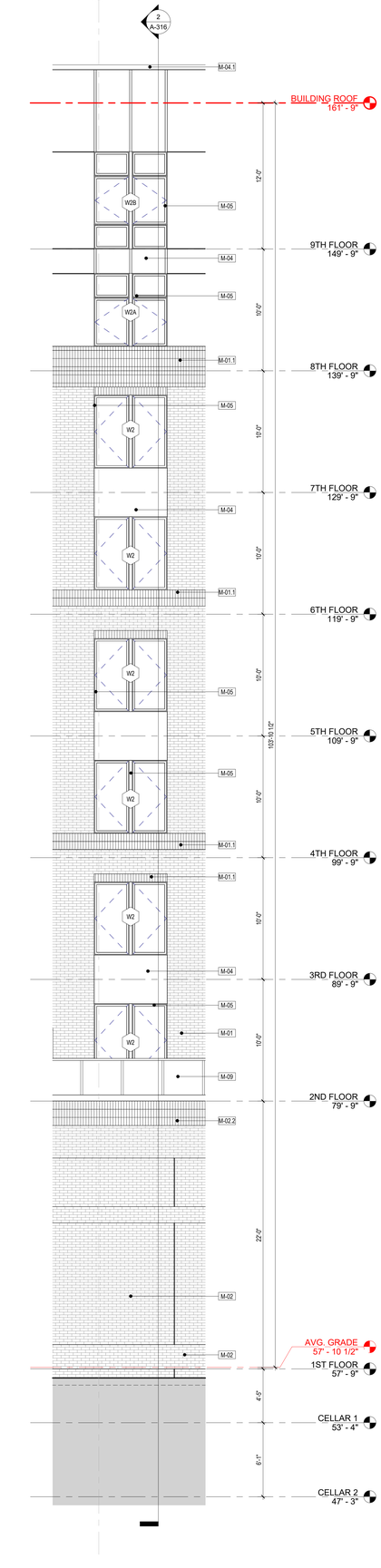


3 A-316 PARTIAL NORTH ELEVATION 01
Scale: 1/4" = 1'-0"

B.3



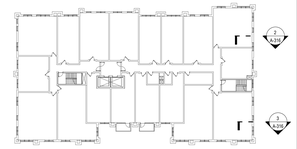
2 A-316 WALL SECTION
Scale: 1/4" = 1'-0"



1 A-316 PARTIAL NORTH ELEVATION
Scale: 1/4" = 1'-0"

MATERIAL SCHEDULE	
NO.	MATERIAL
M-01	BRICK MASONRY - RED
M-01.1	BRICK MASONRY - RED @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-02	BRICK MASONRY - GRAY
M-02.2	BRICK MASONRY - GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-03	METAL PANEL - MEDIUM GRAY
M-03.1	METAL PANEL - MEDIUM GRAY @ HEADERS, SILLS AND VERTICAL/HORIZONTAL BAND DETAILS
M-04	METAL PANEL - DARK GRAY
M-04.1	METAL PANEL - DARK GRAY @ HEADERS, SILL AND VERTICAL/HORIZONTAL BAND DETAILS
M-05	VINYL DOORS AND WINDOWS
M-06	ALUMINUM STOREFRONT/CURTAIN WALLS
M-07	WIRE MESH PANEL
M-09	GLASS RAILING
M-10	GARAGE OVERHEAD ROLLING DOOR
M-11	TRANSFORMER ROOM - OVERHEAD ROLLING DOOR
M-12	PRE-FABRICATED CANOPY
M-13	GARAGE LOUVERS
M-14	WALL SCONCE
M-16B	BRICK SOLDIER COURSE - TYPE B

KEYPLAN



ARCHITECT:
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PORT CHESTER, NY

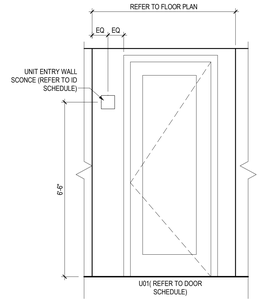
BUILDING WALL SECTIONS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:00:42 AM
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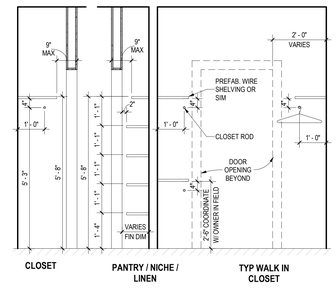
A-316

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5 A-400a TYPICAL UNIT ENTRY ALCOVE ELEVATION

Scale: 1/2" = 1'-0"



NOTES :

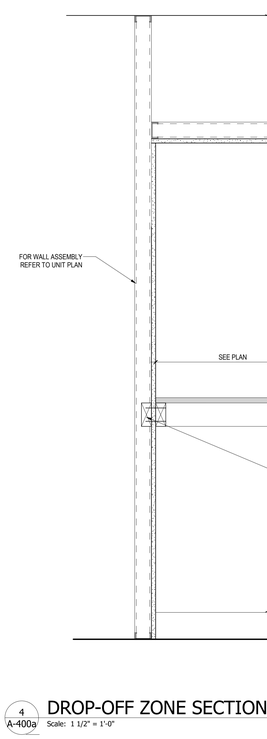
1. PROVIDE INTERMEDIATE SUPPORT FOR SHELVES & CLOSET RODS EXCEEDING 48
2. FOR ANSI TYPE "A" UNITS, AT LEAST ONE CLOSET SHELF TO BE 48" AFF AND ROD AT 44"AFF.

WALK-IN CLOSET (WIC) SCHEDULE :

1R1S = 1 ROD 1 SELF
2R2S = 2 ROD 2 SELF
5SH = 5 SHELVES

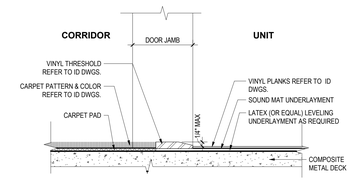
3 A-400a TYPICAL CLOSET DETAIL

Scale: 1/2" = 1'-0"



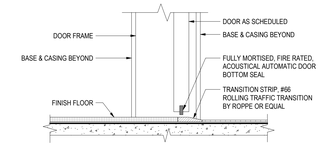
4 A-400a DROP-OFF ZONE SECTION DETAIL

Scale: 1 1/2" = 1'-0"



2 A-400a UNIT ENTRY TRANSITION THRESHOLD DETAIL

Scale: 3" = 1'-0"



1 A-400a UNIT ENTRY SILL DETAIL - STANDARD

Scale: 3" = 1'-0"

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PORT CHESTER, NY

TYPICAL UNIT INTERIOR DETAILS

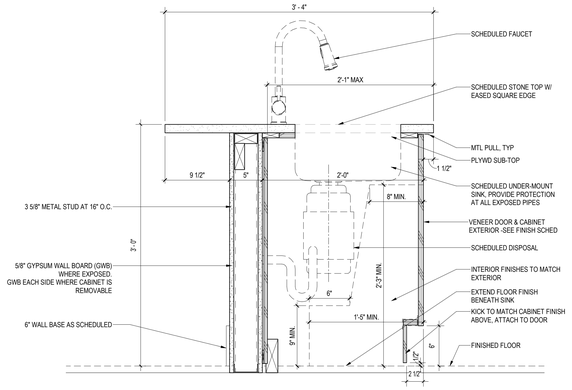
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FILE NAME:

A-400a

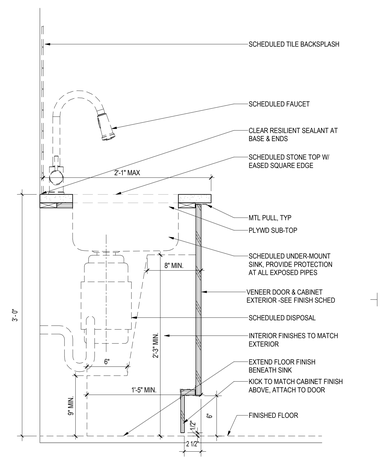
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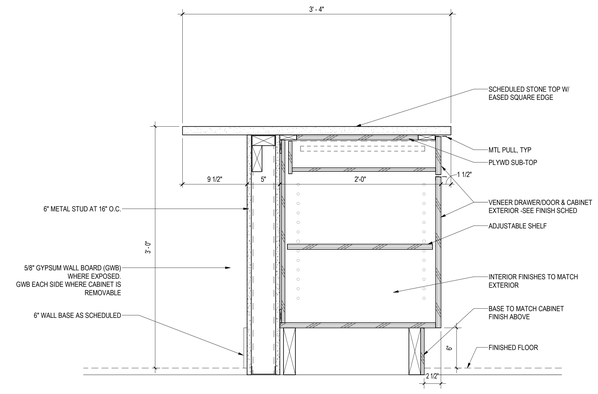
11 A-400b ISLAND/ PENINSULA REMOVABLE SECTION @ SINK

Scale: 1 1/2" = 1'-0"



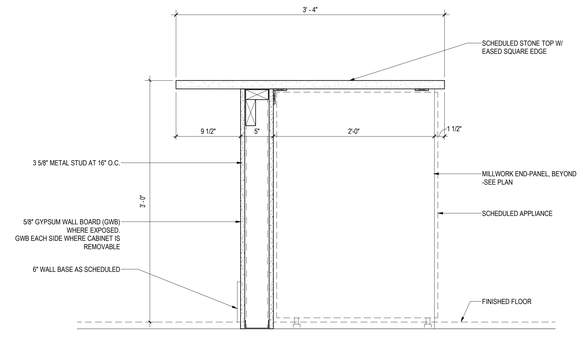
10 A-400b REMOVABLE CABINET SECTION @ SINK

Scale: 1 1/2" = 1'-0"



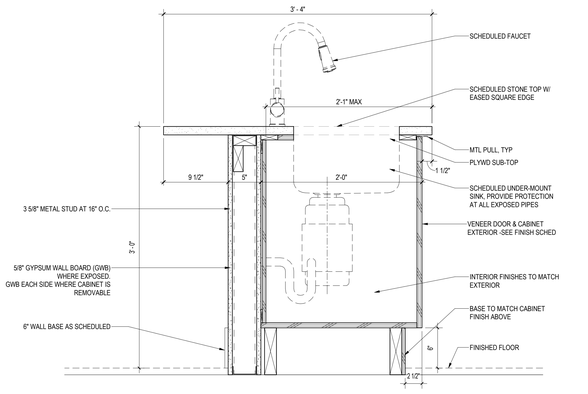
9 A-400b ISLAND/ PENINSULA SECTION @ DRAWER & DOOR

Scale: 1 1/2" = 1'-0"



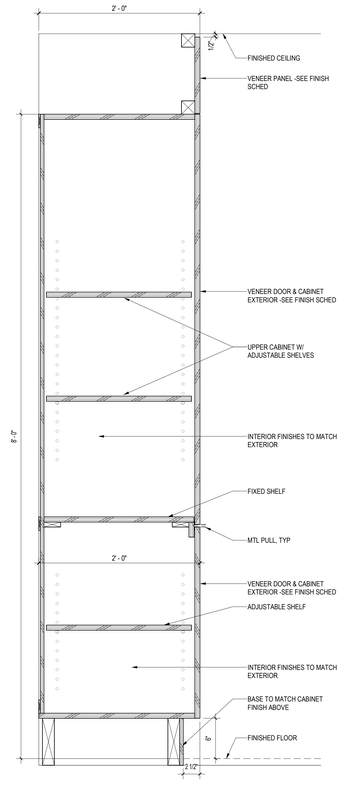
8 A-400b ISLAND/ PENINSULA SECTION @ DISHWASHER

Scale: 1 1/2" = 1'-0"



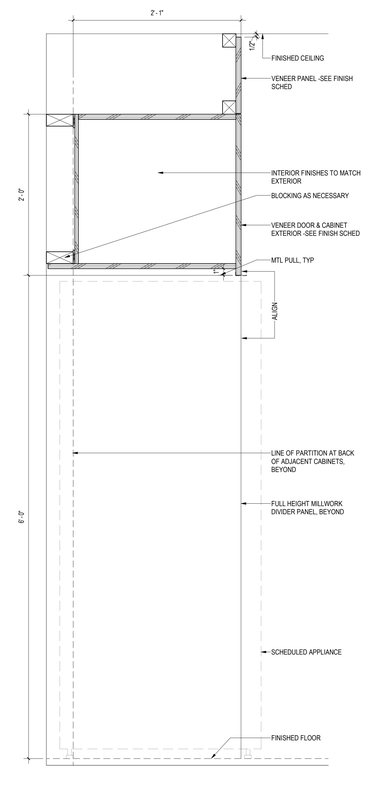
7 A-400b ISLAND/ PENINSULA SECTION @ SINK

Scale: 1 1/2" = 1'-0"



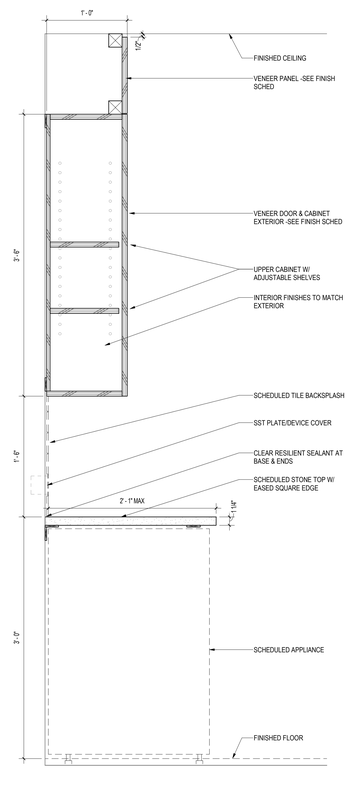
6 A-400b CABINET SECTION @ PANTRY

Scale: 1 1/2" = 1'-0"



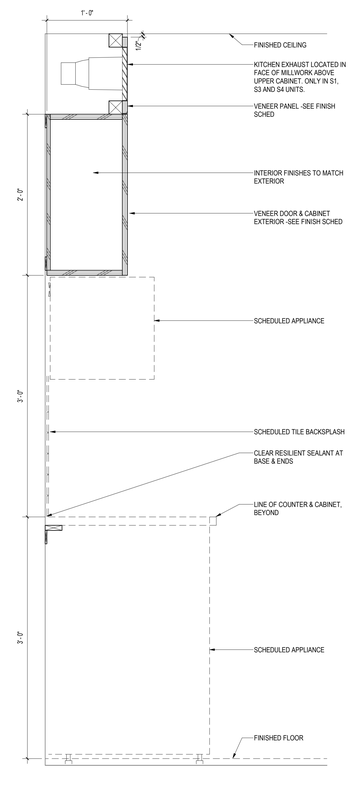
5 A-400b CABINET SECTION @ REFRIGERATOR

Scale: 1 1/2" = 1'-0"



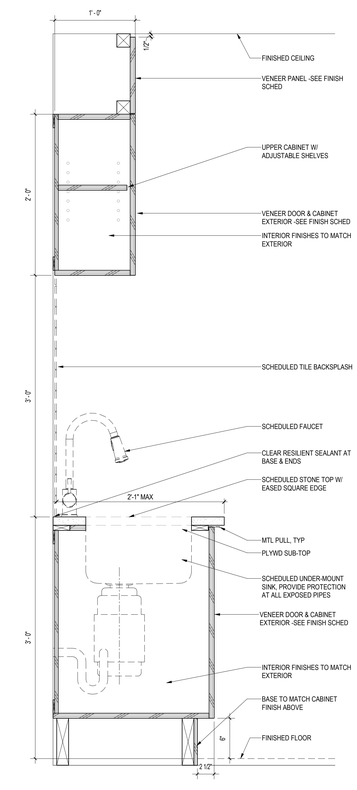
4 A-400b CABINET SECTION @ DISHWASHER

Scale: 1 1/2" = 1'-0"



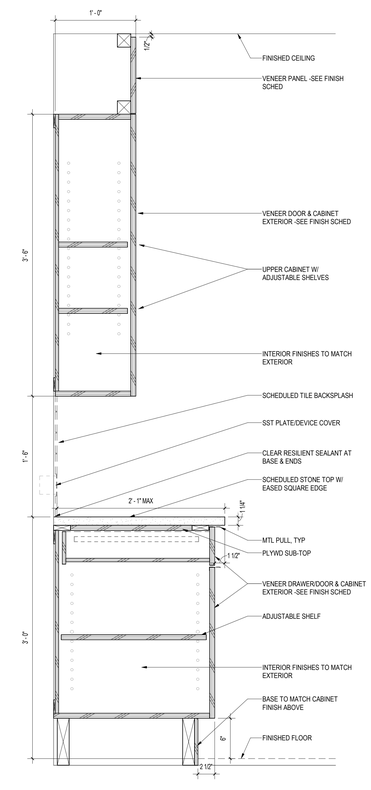
3 A-400b CABINET SECTION @ COOKTOP & OVEN

Scale: 1 1/2" = 1'-0"



2 A-400b CABINET SECTION @ SINK

Scale: 1 1/2" = 1'-0"



1 A-400b CABINET SECTION @ DRAWER & DOOR

Scale: 1 1/2" = 1'-0"

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

TYPICAL KITCHEN DETAILS

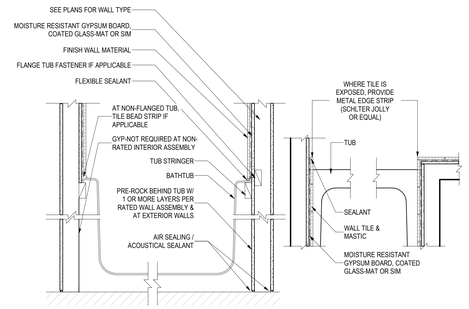
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PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:03:41 AM
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A-400b

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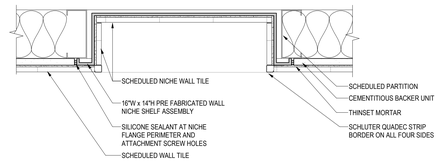
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BATHTUB DETAIL SECTION (0-HR) | **BATHTUB DETAIL SECTION (RATED WALL)** | **BATHTUB DETAIL - AT TILE PLAN DETAIL A**

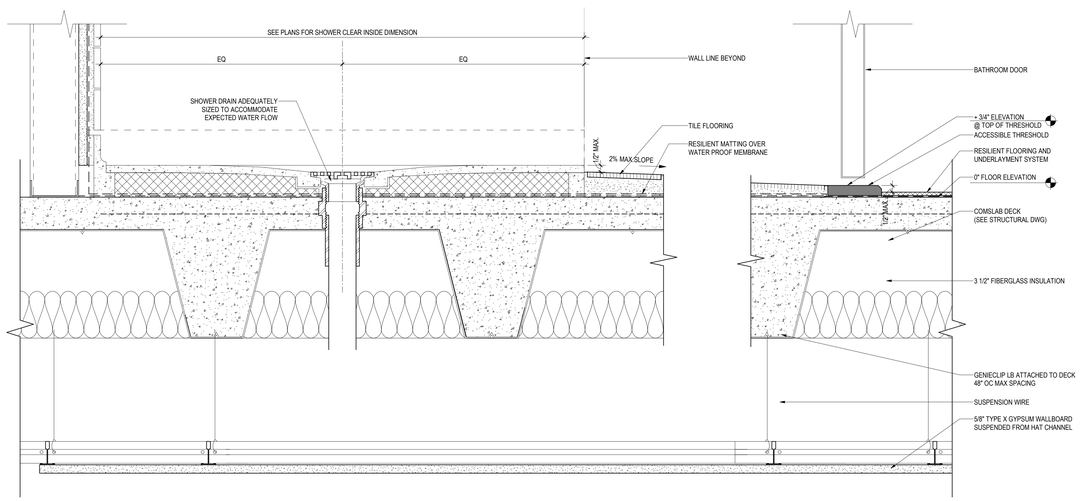
3 A-400c TYPICAL BATHTUB DETAILS

Scale: 1" = 1'-0"



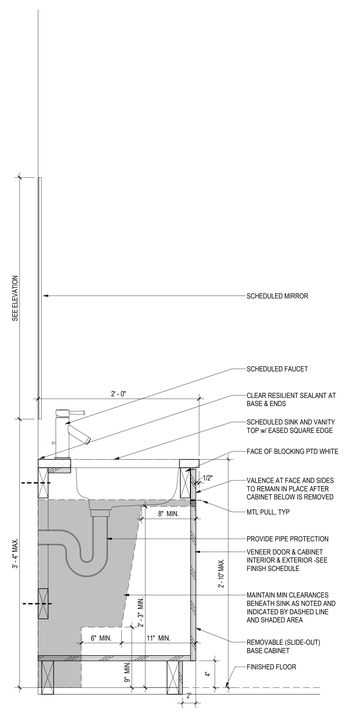
2 A-400c TYPICAL SHOWER NICHE PLAN DETAIL

Scale: 3" = 1'-0"



4 A-400c SHOWER THRESHOLD SECTION

Scale: 3" = 1'-0"



1 A-400c VANITY SECTION @ SINK

Scale: 1 1/2" = 1'-0"

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359 Springfield Ave - 2nd Fl.
Summit, NJ 07901

28 Pearl Street
PORT CHESTER, NY

TYPICAL BATHROOM DETAILS

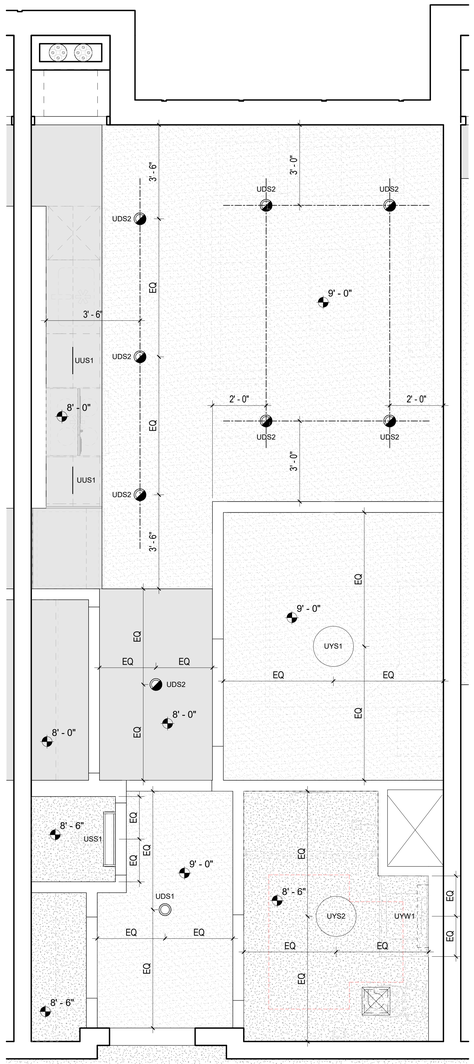
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	25% DD SUBMISSION	12/13/24

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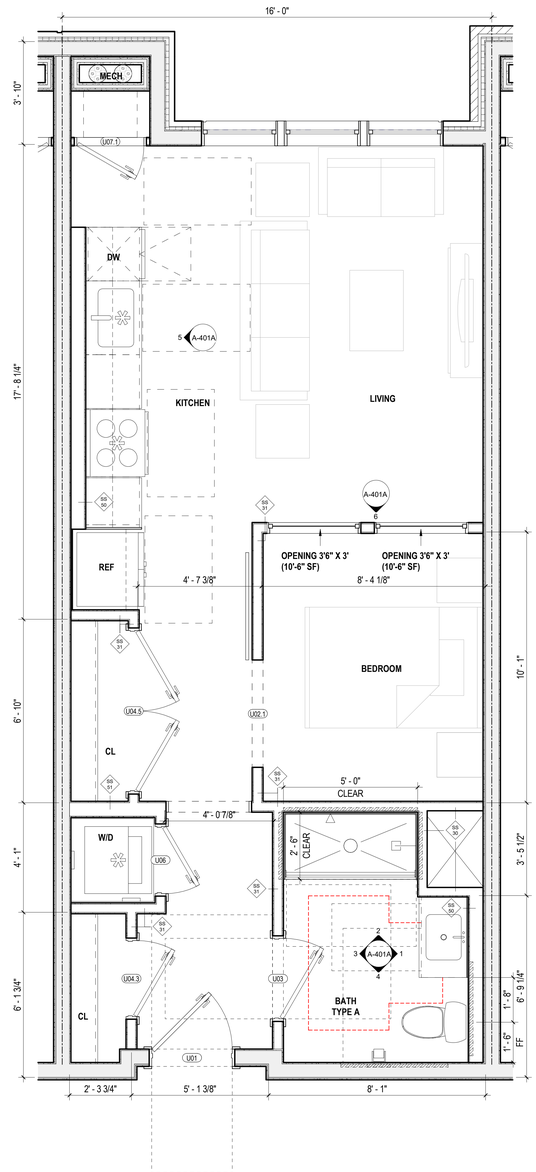
A-400c

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2 A-401 UNIT S1 RCP
Scale: 1/2" = 1'-0"



1 A-401 UNIT S1 PLAN (574 SF)
Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHITNG SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

UDS1	ENTRANCE
UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
UYS1	BEDROOM
UYS2	BATHROOM
UYW1	BATHROOM VANITY TOP
UDP1	KITCHEN PENINSULA
USS1	CLOSET & WASHER DRYER
UD4	WALK IN CLOSET
UUS1	KITCHEN UNDER CABINET

KEYPLAN



PROJECT NORTH

ARCHITECT:
lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (S1)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:03:44 AM
FILE NAME:

A-401

Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/SAC001A - ARCH - 28 Pearl Street.rvt

KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
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SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

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6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

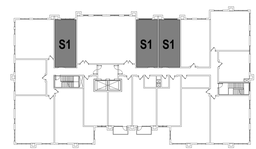
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
SMOKE DETECTOR DEVICE

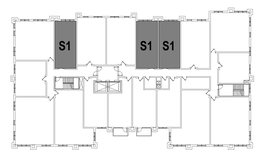
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

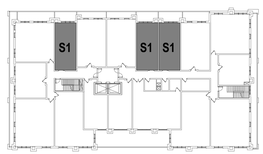
KEYPLAN



9TH FLOOR

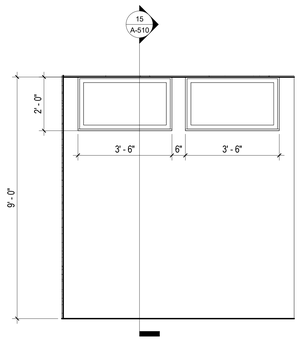


TYPICAL (3RD-8TH)

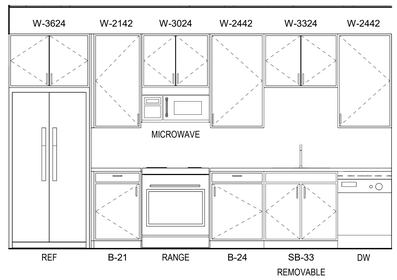


2ND FLOOR

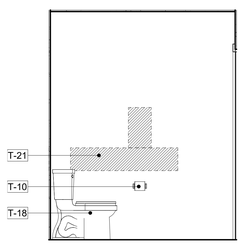
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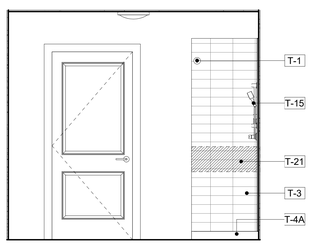
6 A-401A TRANSOM ELEVATION
Scale: 1/2" = 1'-0"



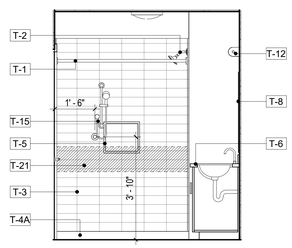
5 A-401A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



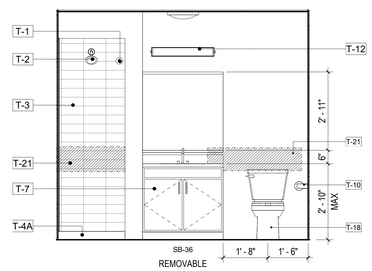
4 A-401A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-401A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-401A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-401A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

ARCHITECT:

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SEAL & SIGNATURE:

OWNER:

28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (S1)

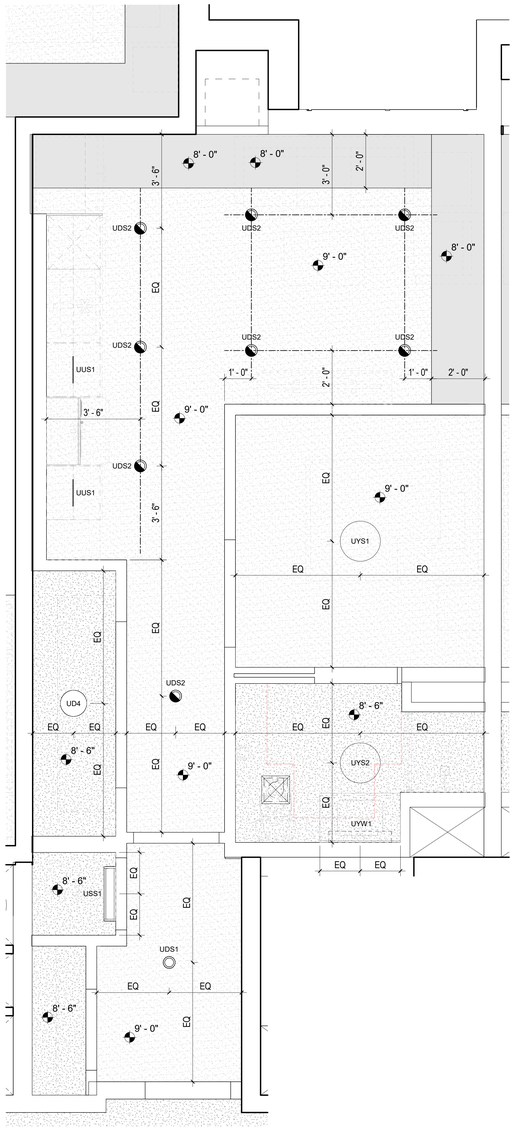
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	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:03:46 AM
FILE NAME:

A-401A

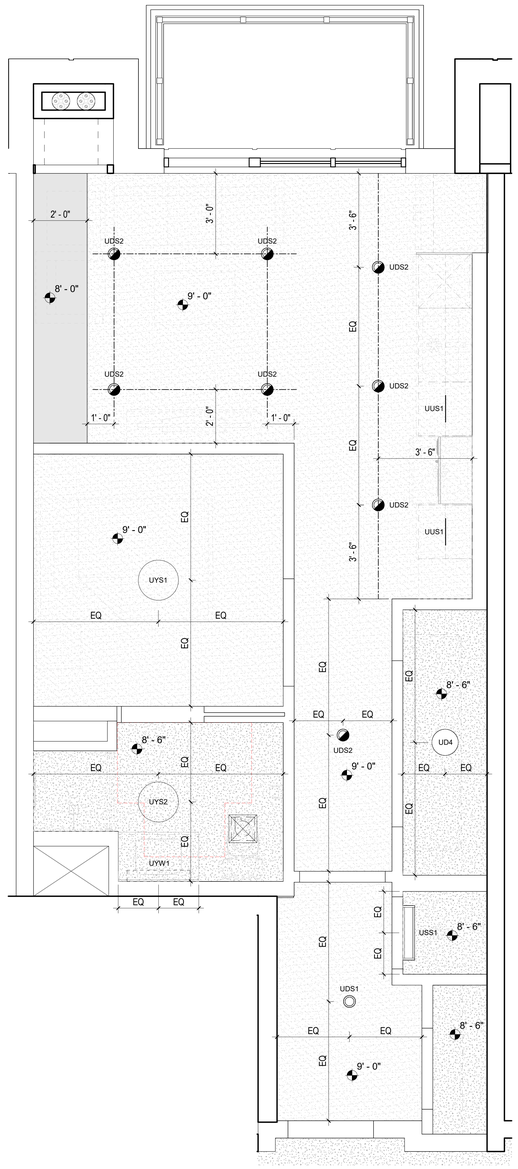
Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt

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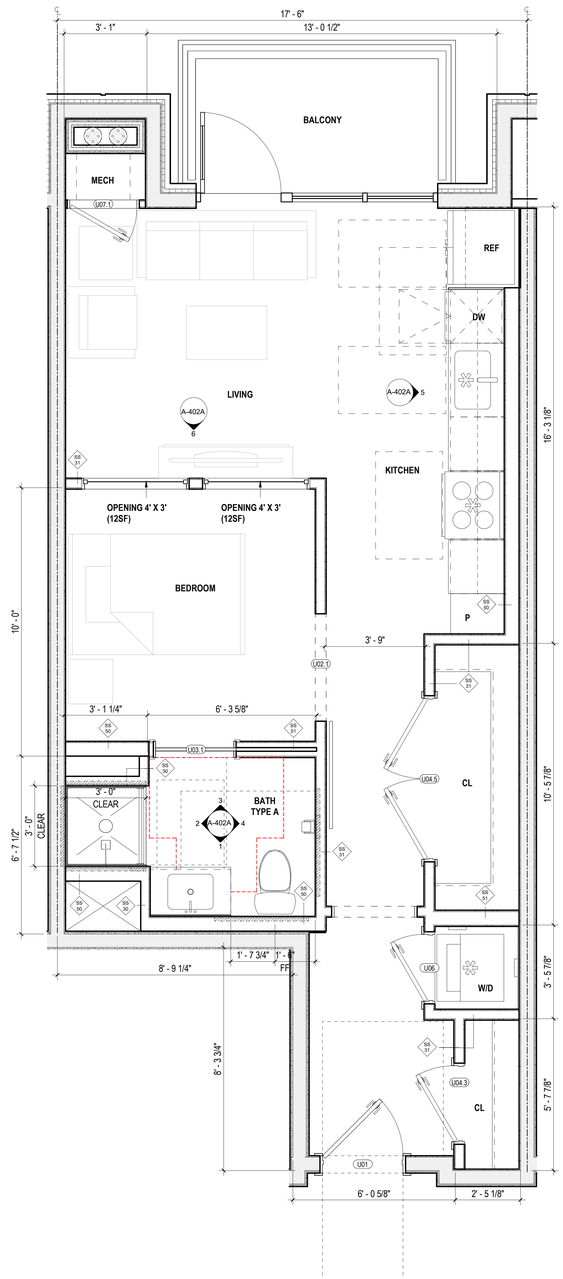
RCP LAYOUT AT UNITS 322, 422, 522, 622, 722, 822 & 922

9 A-402 UNIT S2 RCP
Scale: 1/2" = 1'-0"



RCP LAYOUT AT UNITS 320, 420, 520, 620, 720, 820 & 920

2 A-402 UNIT S2 RCP
Scale: 1/2" = 1'-0"



1 A-402 UNIT S2 PLAN (579 SF)
Scale: 1/2" = 1'-0"

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MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

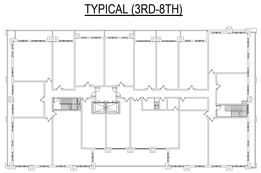
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

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SEAL & SIGNATURE:

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Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (S2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:03:49 AM
FILE NAME:

A-402

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KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

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UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
SMOKE DETECTOR DEVICE

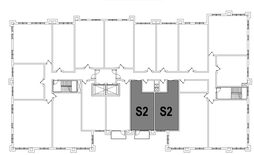
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
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	UUS1	KITCHEN UNDER CABINET

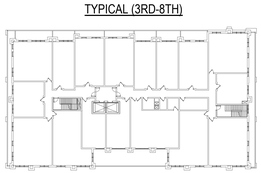
KEYPLAN



9TH FLOOR

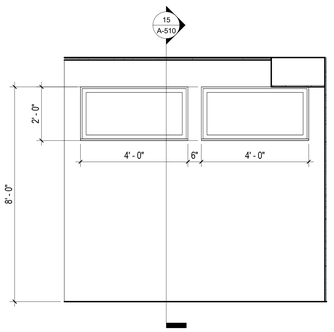


TYPICAL (3RD-8TH)

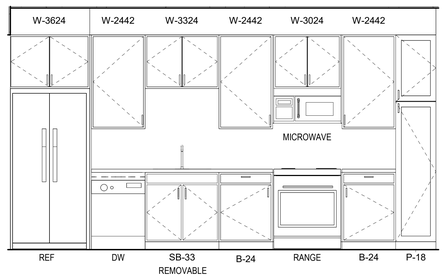


2ND FLOOR

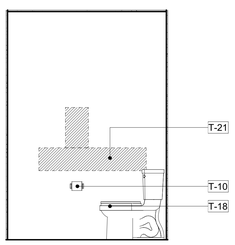
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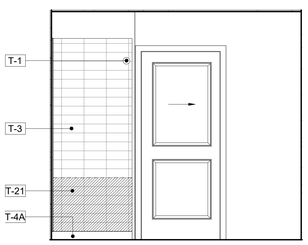
6 A-402A TRANSOM ELEVATION
Scale: 1/2" = 1'-0"



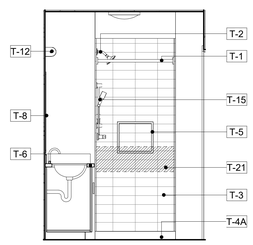
5 A-402A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



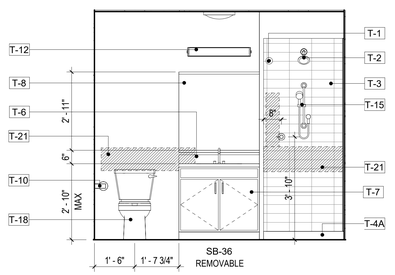
4 A-402A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-402A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-402A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-402A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

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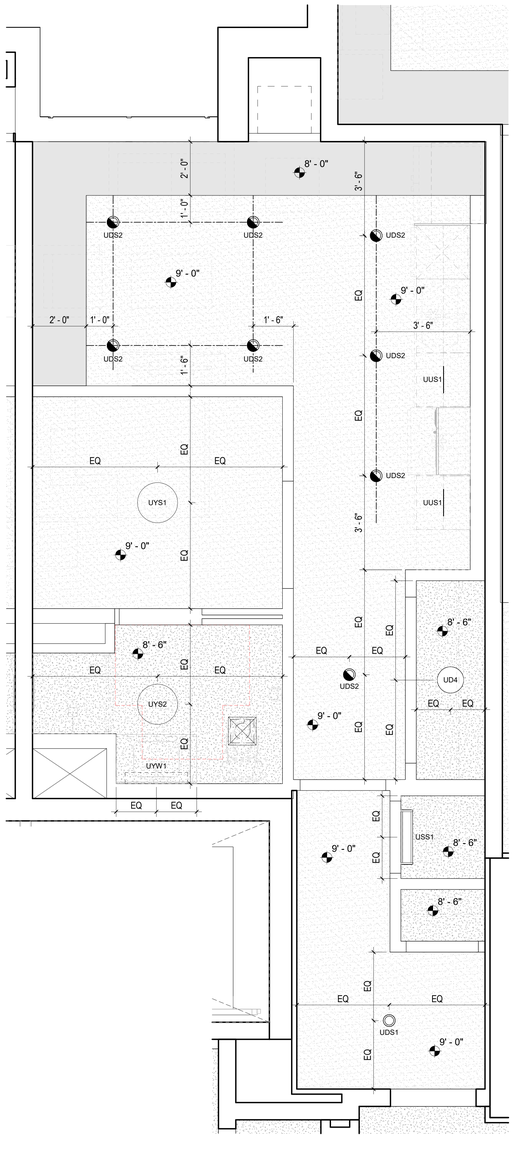
UNIT PLAN (S2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:03:52 AM
FILE NAME:

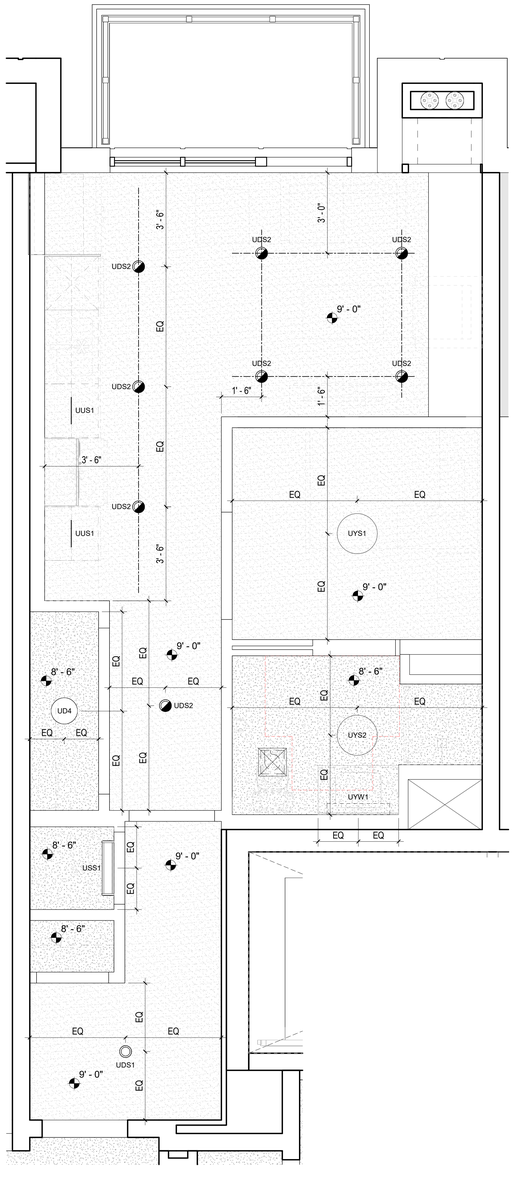
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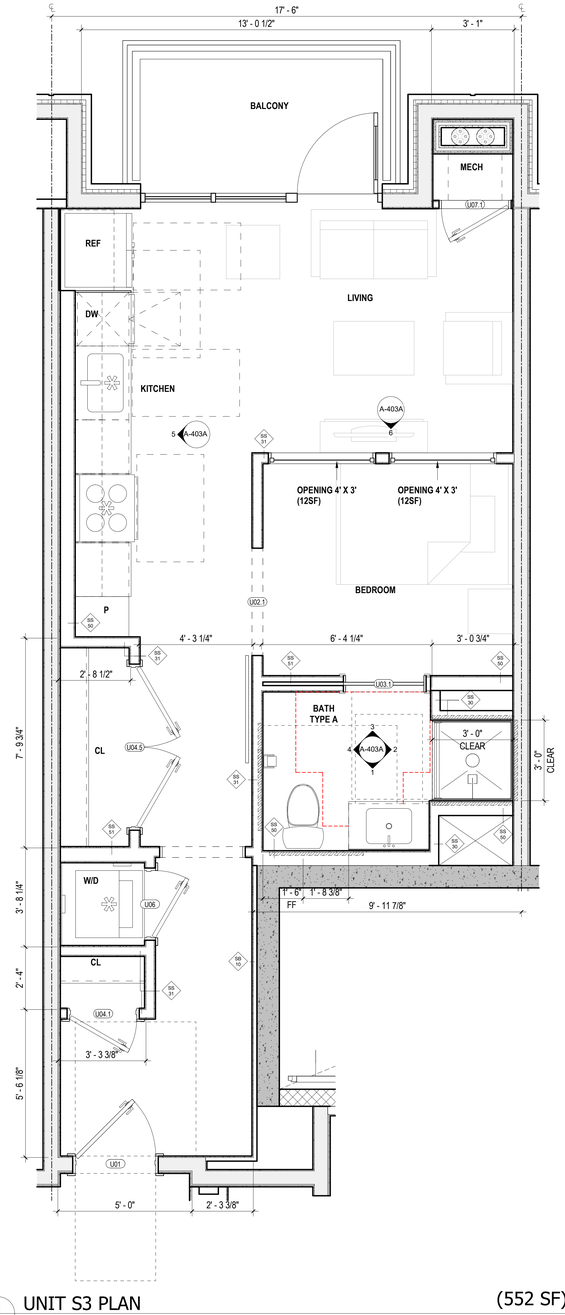
RCP LAYOUT AT UNITS - 216, 316, 416, 516, 616, 716, 816 & 916

9 A-403 UNIT S3 RCP
Scale: 1/2" = 1'-0"



RCP LAYOUT AT UNITS - 218, 318, 418, 518, 618, 718, 818 & 918

2 A-403 UNIT S3 RCP
Scale: 1/2" = 1'-0"



1 A-403 UNIT S3 PLAN (552 SF)
Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
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15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
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18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
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23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
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31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

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SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
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- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
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UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHITNG SCHEDULE.
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UNIT MECAHNICAL ELEMENTS LEGEND

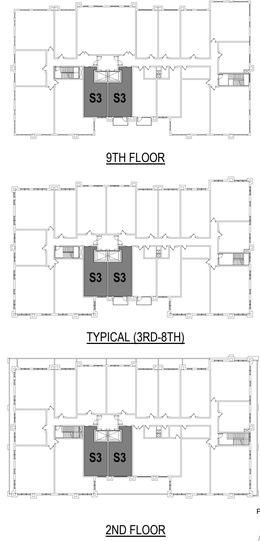
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

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	UUS1	KITCHEN UNDER CABINET

KEYPLAN



PROJECT NORTH

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28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (S3)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 1:39:42 PM
FILE NAME:

A-403

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KEYNOTE LEGEND	
VALUE	DESCRIPTION
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T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
SMOKE DETECTOR DEVICE

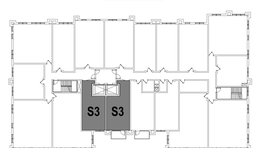
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

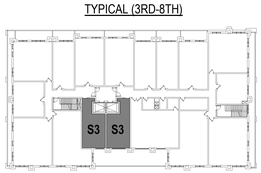
KEYPLAN



9TH FLOOR



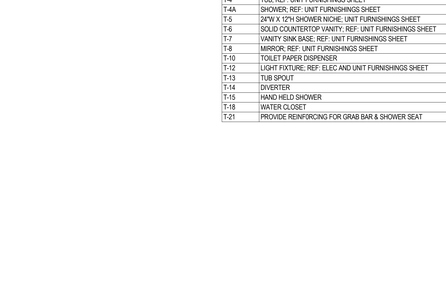
TYPICAL (3RD-8TH)



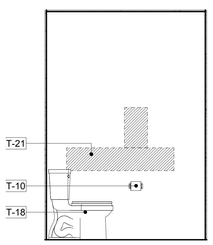
2ND FLOOR

PROJECT NORTH

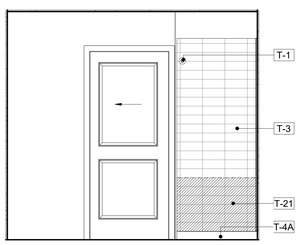
6 A-403A TRANSOM ELEVATION - S3
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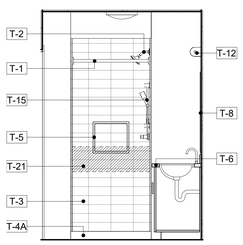
5 A-403A KITCHEN - ELEVATION 1
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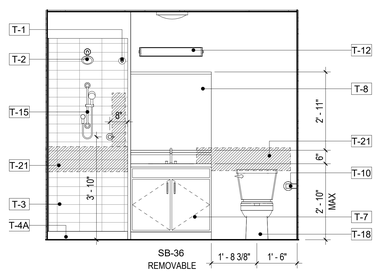
4 A-403A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-403A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-403A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-403A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

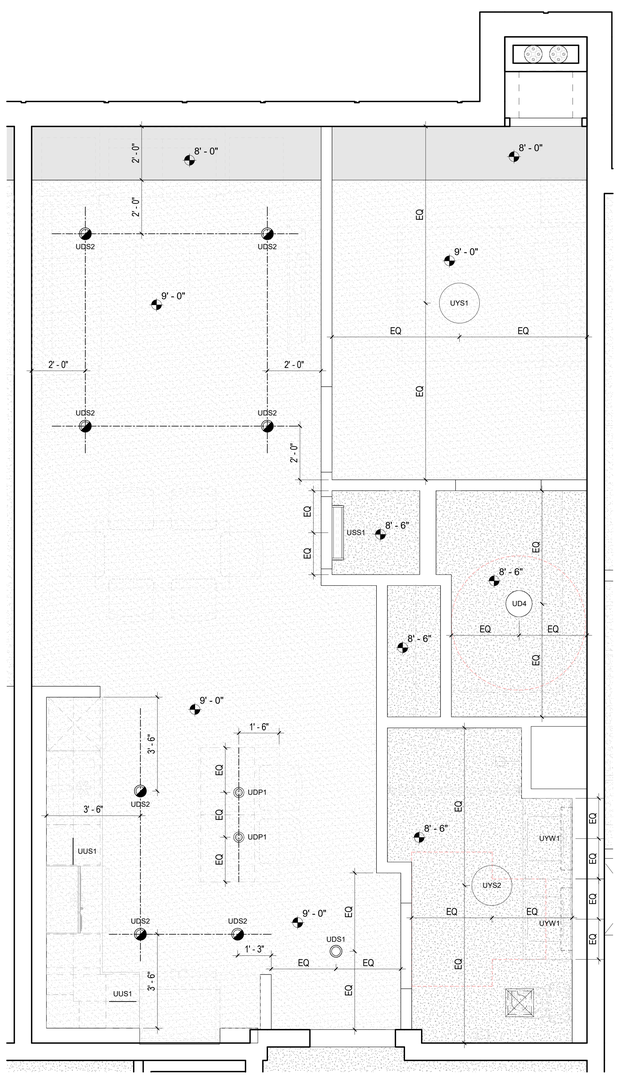
UNIT PLAN (S3)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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CHECKED BY: Checker
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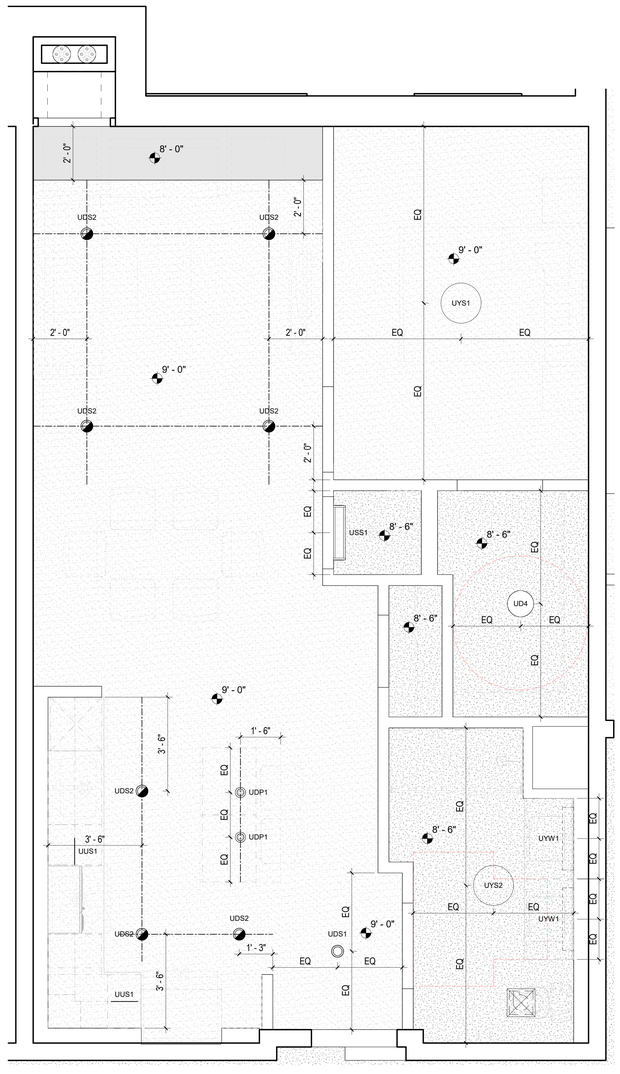
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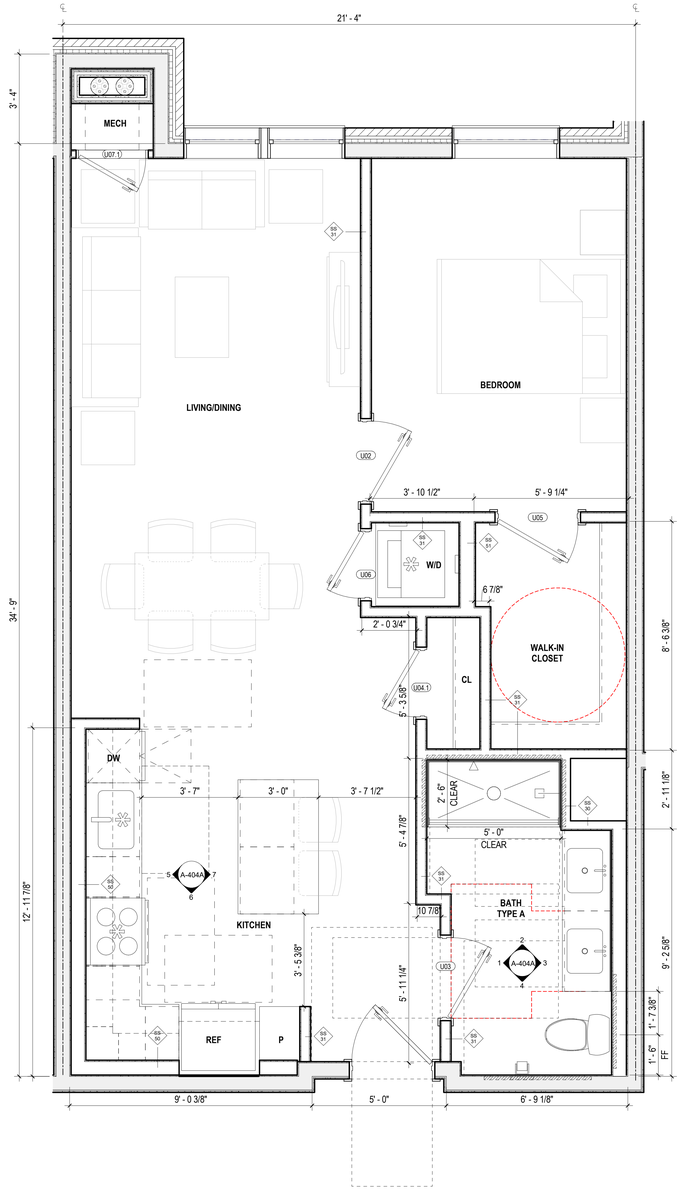
RCP LAYOUT AT UNITS 215, 315, 415, 515, 615, 715 & 815
217, 317, 417, 517, 617, 717 & 817

2 A-404 UNIT A1 RCP
Scale: 1/2" = 1'-0"



RCP LAYOUT AT UNITS 223, 323, 423, 523, 623, 723, 823 & 923

3 A-404 UNIT A1 RCP
Scale: 1/2" = 1'-0"



1 A-404 UNIT A1 PLAN (763 SF)
Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

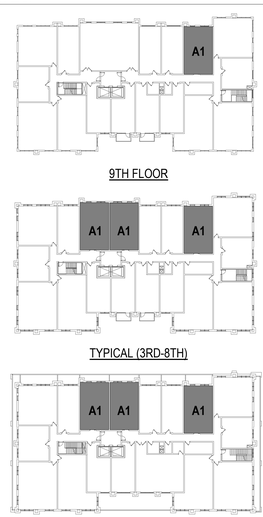
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

KEYPLAN



PROJECT NORTH

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OWNER:
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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

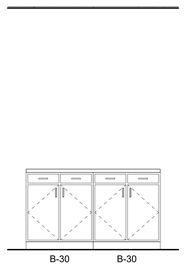
UNIT PLAN (A1)

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

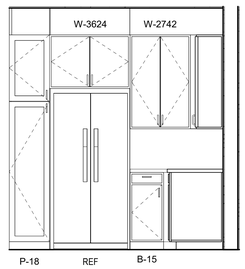
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A-404

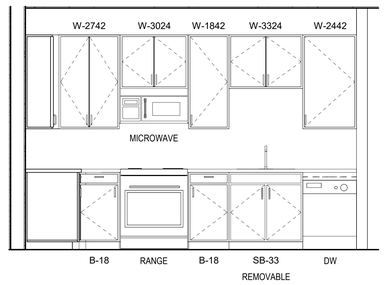
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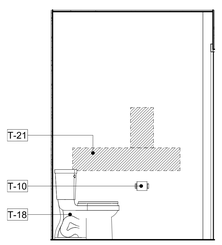
7 A-404A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



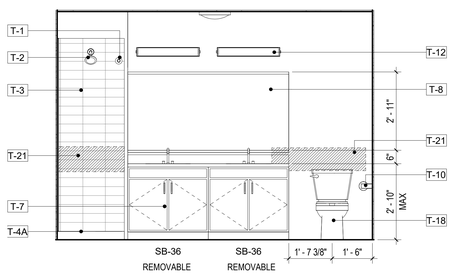
6 A-404A KITCHEN - ELEVATION 2
Scale: 1/2" = 1'-0"



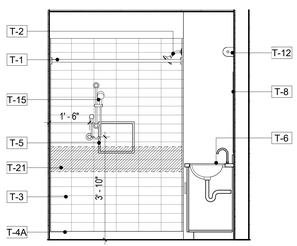
5 A-404A KITCHEN - ELEVATION 3
Scale: 1/2" = 1'-0"



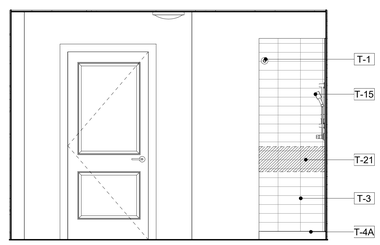
4 A-404A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-404A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-404A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-404A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

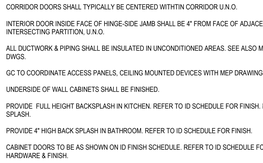
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	US1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UU1	KITCHEN UNDER CABINET

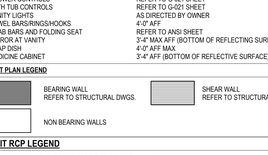
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:
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28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
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28 Pearl Street
PORT CHESTER, NY

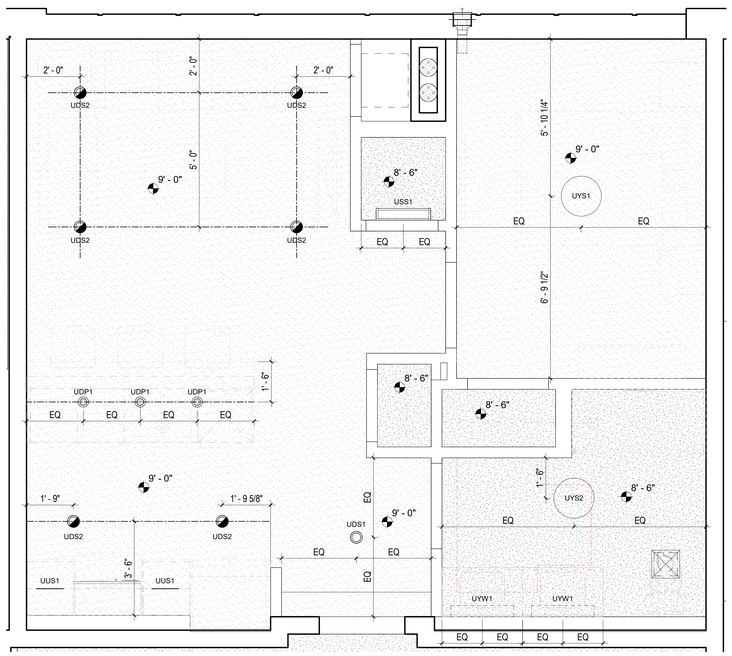
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NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

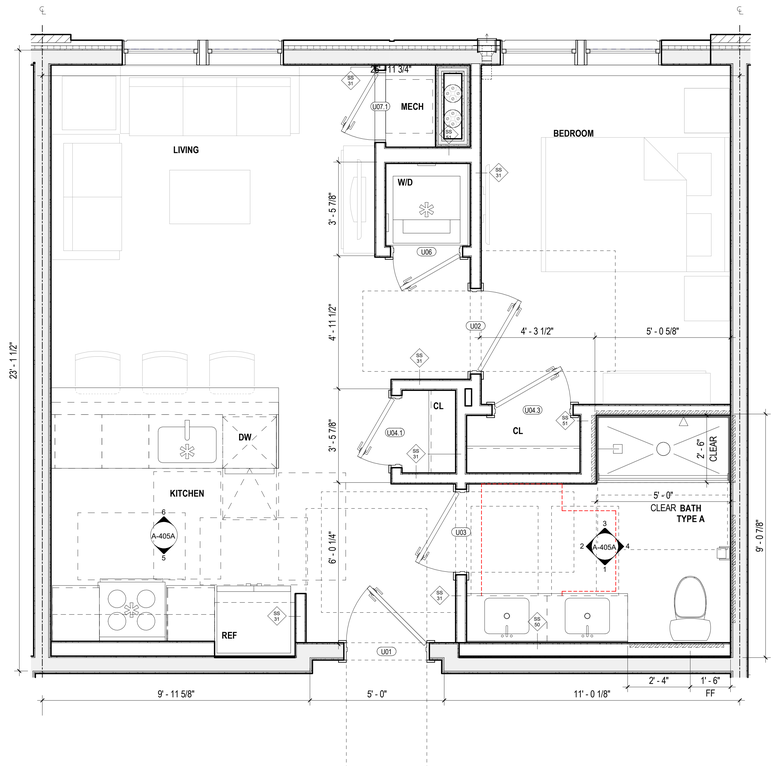
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PLOT DATE: 2/7/2025 10:04:03 AM
FILE NAME:

A-404A

Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt



2 A-405 UNIT A2 RCP
Scale: 1/2" = 1'-0"



1 A-405 UNIT A2 PLAN
Scale: 1/2" = 1'-0"

(598 SF)

UNIT GENERAL NOTES

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SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

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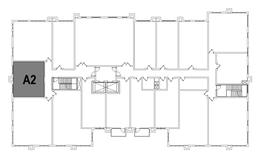
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

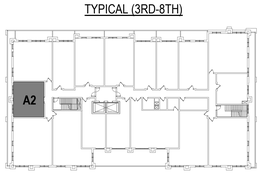
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:
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28 PEARL STREET DEVELOPMENT LLC
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28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (A2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:04:05 AM
FILE NAME:

A-405

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KEYNOTE LEGEND

VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

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UNIT PLAN LEGEND

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REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

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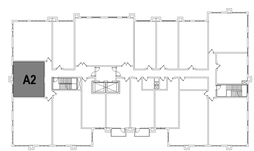
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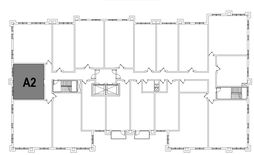
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	US51	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UU51	KITCHEN UNDER CABINET

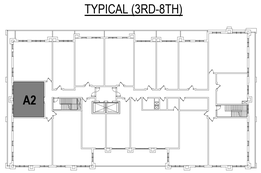
KEYPLAN



9TH FLOOR

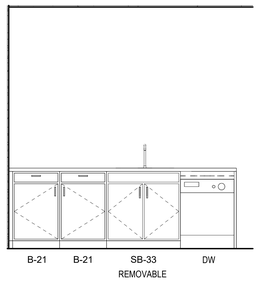


TYPICAL (3RD-8TH)

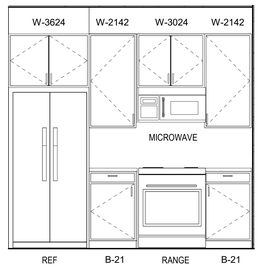


2ND FLOOR

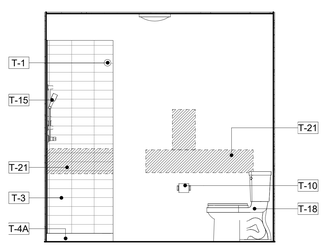
PROJECT NORTH



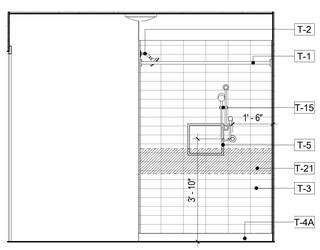
6 A-405A KITCHEN - ELEVATION 2
Scale: 1/2" = 1'-0"



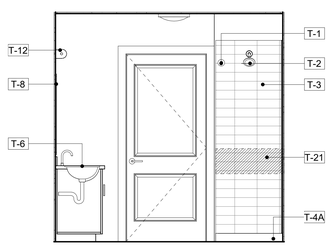
5 A-405A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



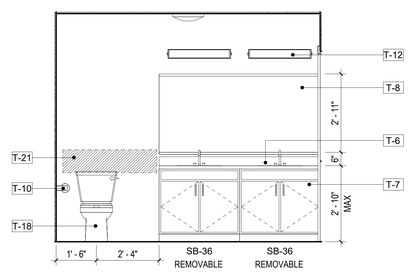
4 A-405A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-405A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-405A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-405A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

ARCHITECT:
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8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
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OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (A2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:04:07 AM
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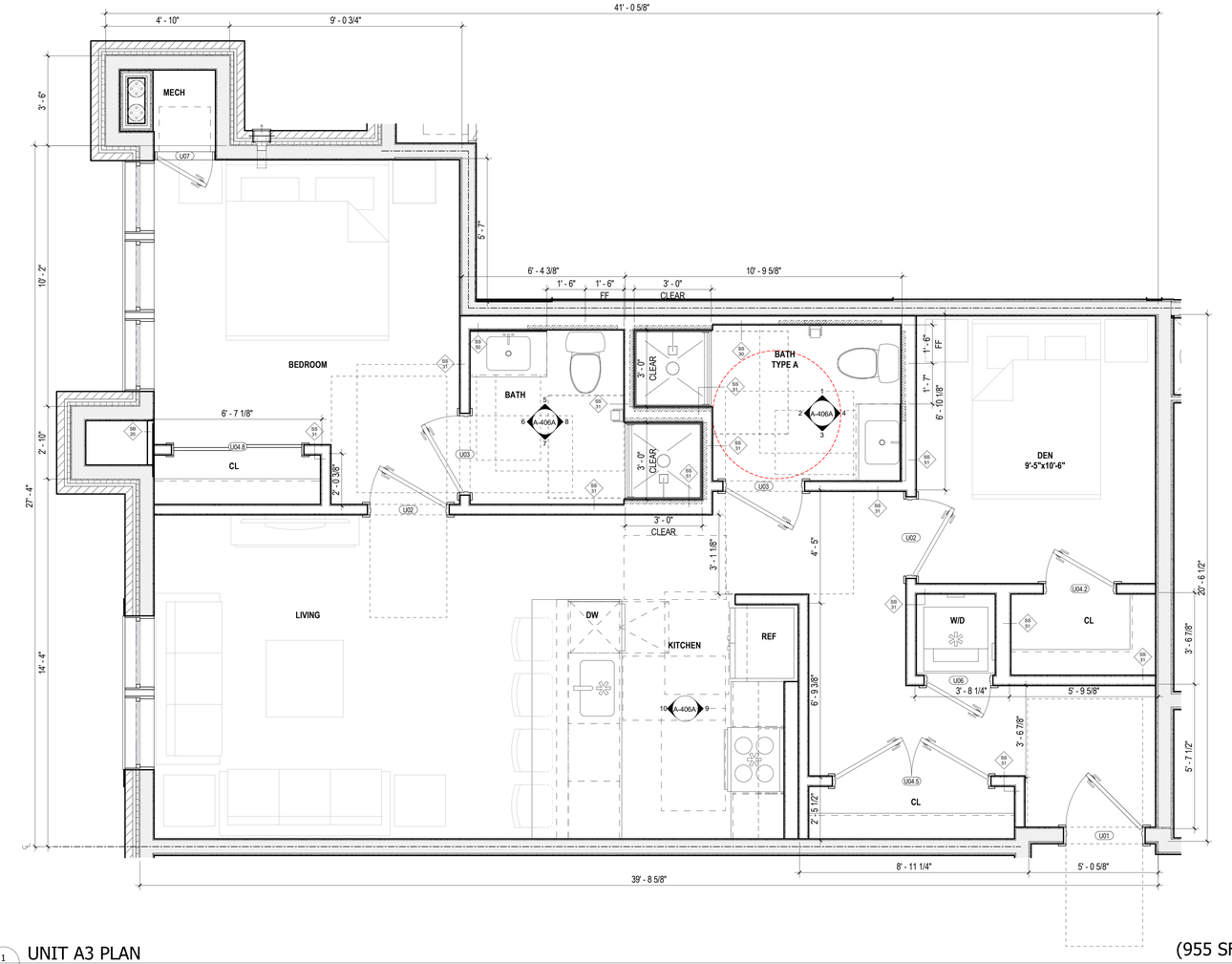
A-405A

Autodesk Docs://Pearl Development - SKG0001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt



2 A-406 UNIT A3 RCP

Scale: 1/2" = 1'-0"



1 A-406 UNIT A3 PLAN (955 SF)

Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET.
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

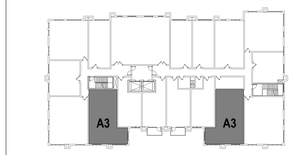
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

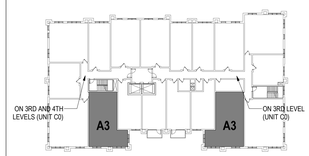
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

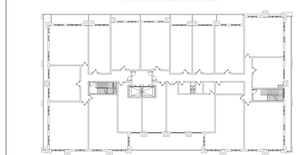
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

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SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

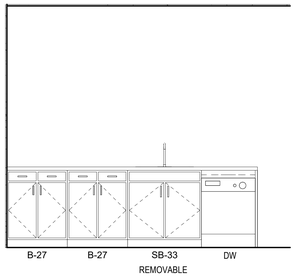
UNIT PLAN (A3)

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

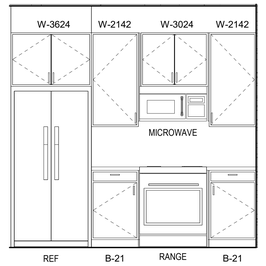
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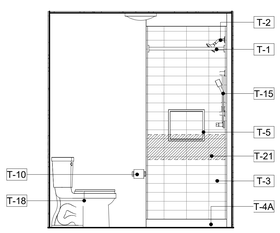
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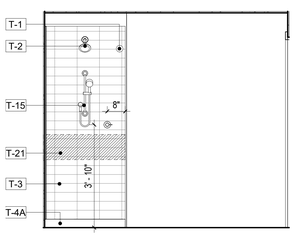
10 A-406A KITCHEN - ELEVATION 2
Scale: 1/2" = 1'-0"



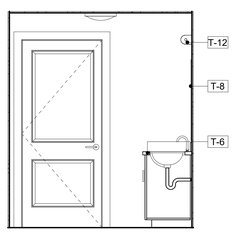
9 A-406A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



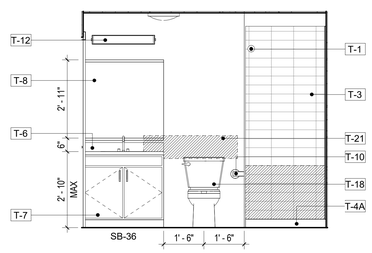
8 A-406A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



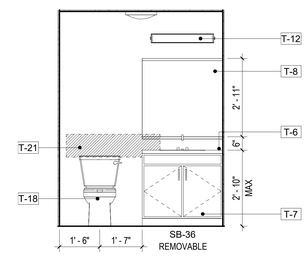
7 A-406A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



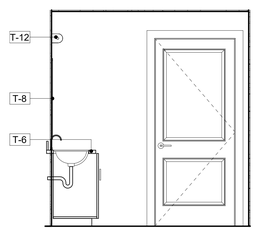
6 A-406A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



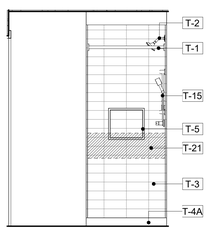
5 A-406A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"



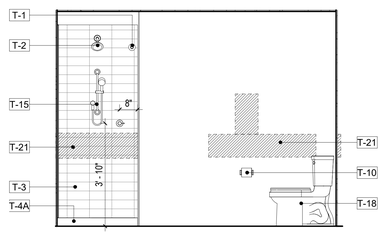
4 A-406A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-406A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-406A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-406A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
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9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
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11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES. JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

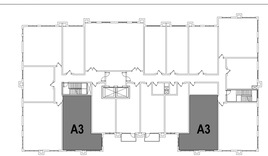
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

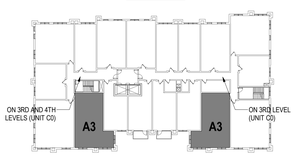
UNIT LIGHTING FIXTURE LEGEND

UDS1	ENTRANCE
UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
UYS1	BEDROOM
UYS2	BATHROOM
UYW1	BATHROOM VANITY TOP
UDP1	KITCHEN PENINSULA
USS1	CLOSET & WASHER DRYER
UD4	WALK IN CLOSET
UUS1	KITCHEN UNDER CABINET

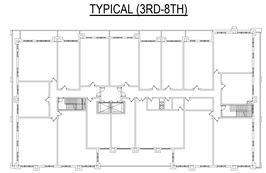
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:

lessard DESIGN INC. P.C.

8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

SEAL & SIGNATURE:

OWNER:

28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (A3)

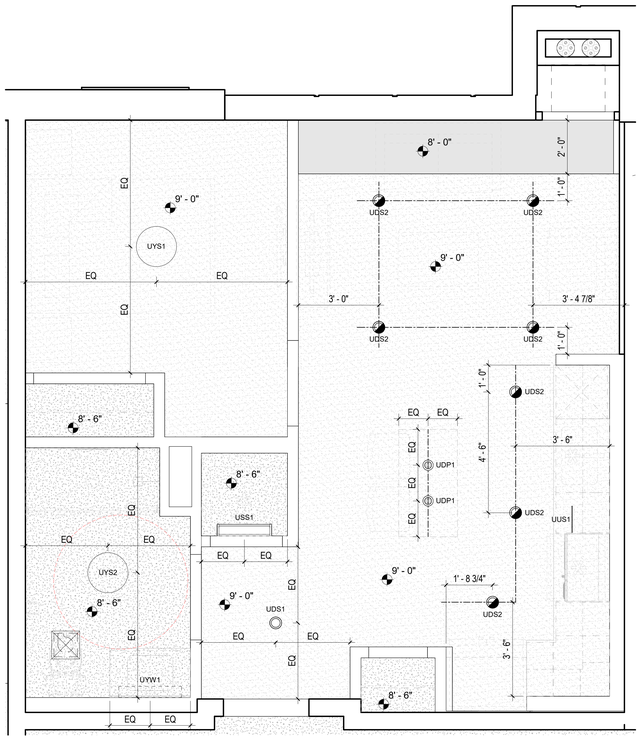
NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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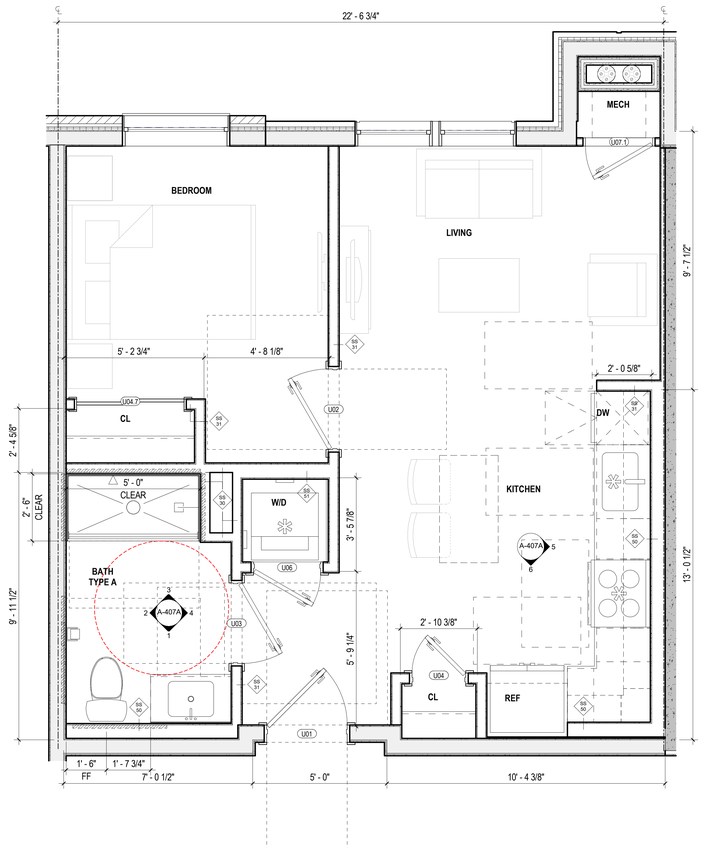
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Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKG001A - ARCH - 28 Pearl Street.rvt

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2 A-407 UNIT A4 RCP
Scale: 1/2" = 1'-0"



1 A-407 UNIT A4 PLAN (535 SF)
Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES. JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

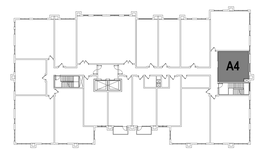
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
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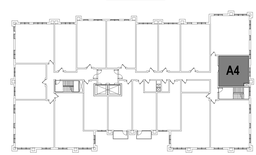
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
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	UYS1	BEDROOM
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	USS1	CLOSET & WASHER DRYER
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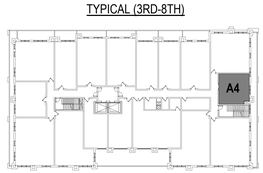
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:
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28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (A4)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
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FILE NAME:

A-407

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KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

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UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

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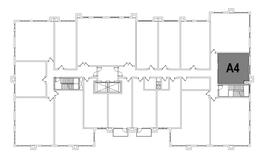
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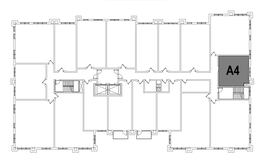
UNIT LIGHTING FIXTURE LEGEND

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	UDP1	KITCHEN PENINSULA
	US51	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UU51	KITCHEN UNDER CABINET

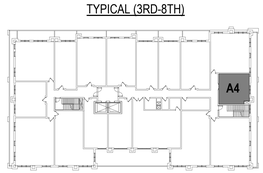
KEYPLAN



9TH FLOOR

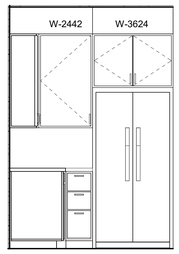


TYPICAL (3RD-8TH)

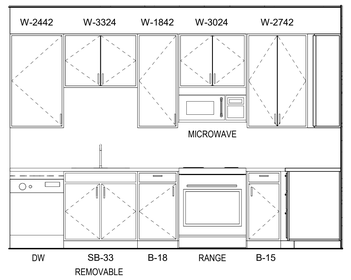


2ND FLOOR

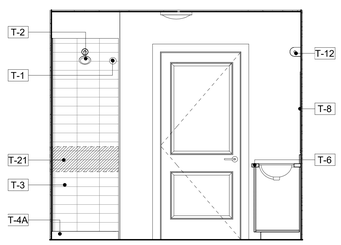
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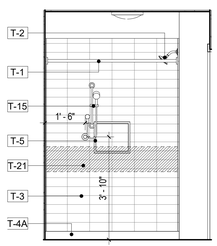
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Scale: 1/2" = 1'-0"



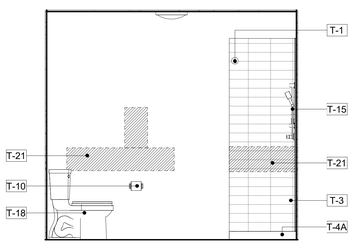
5 A-407A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



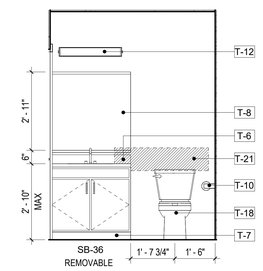
4 A-407A BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-407A BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-407A BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-407A BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

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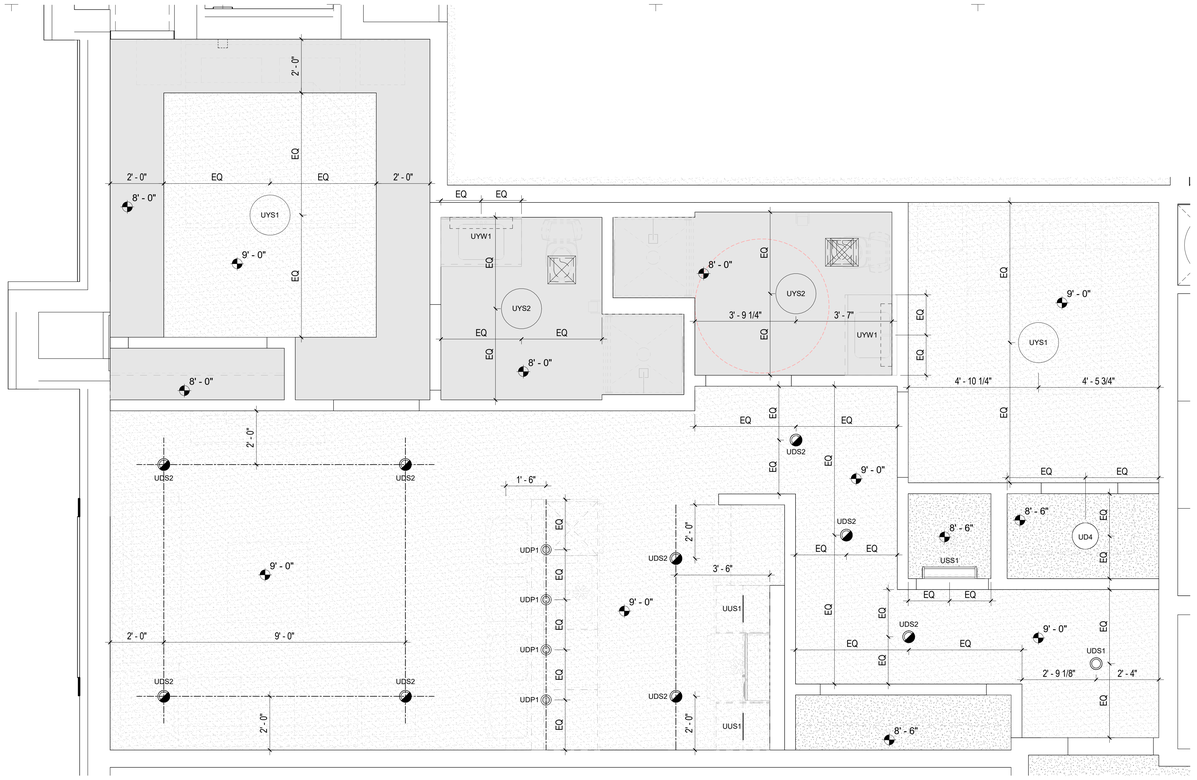
UNIT PLAN (A4)

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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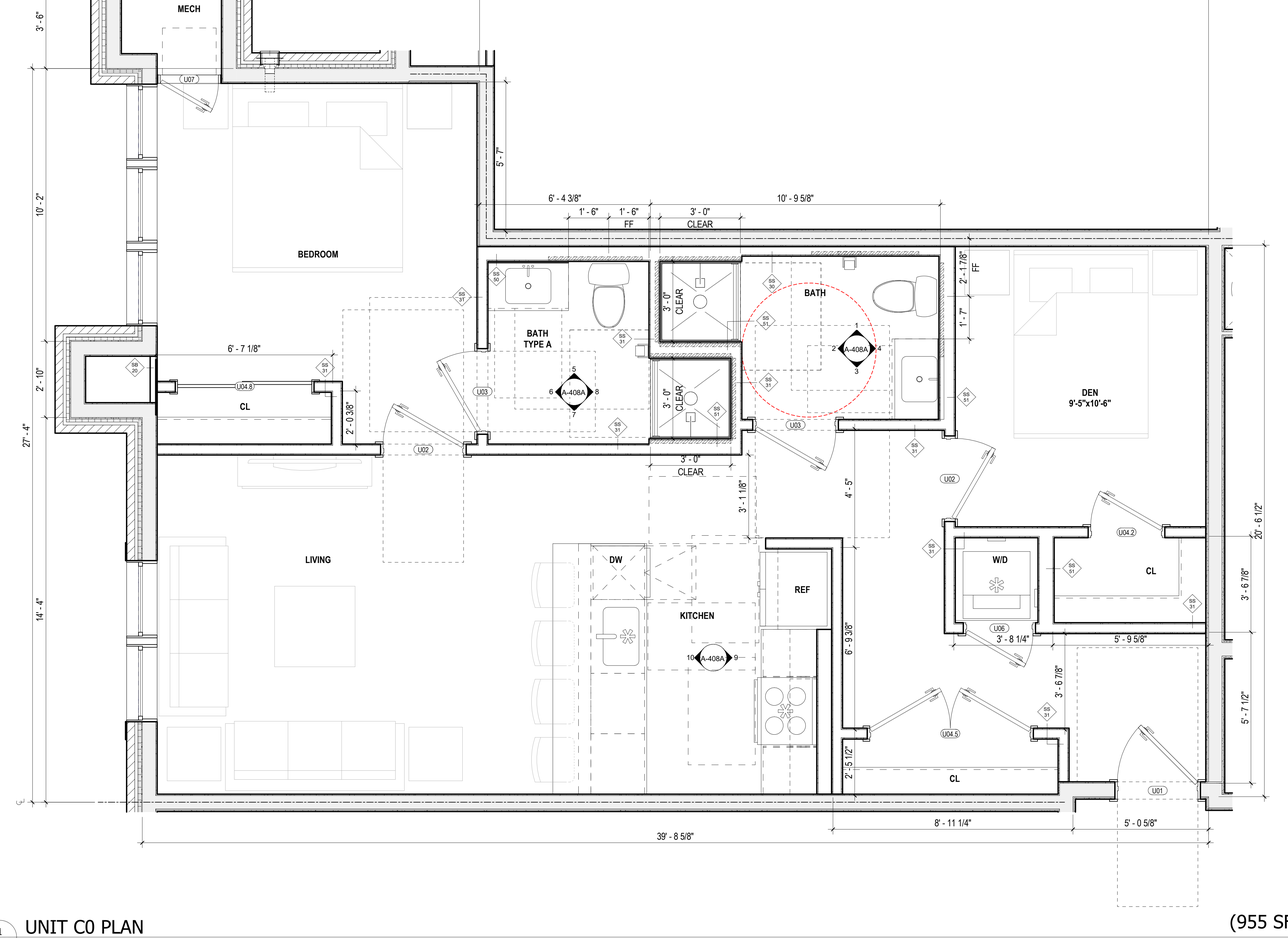
A-407A

Autodesk Docs://Pearl Development - SKG001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt



2 A-408 UNIT C0 RCP

Scale: 1/2" = 1'-0"



1 A-408 UNIT C0 PLAN

Scale: 1/2" = 1'-0"

(955 SF)

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FL/R/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

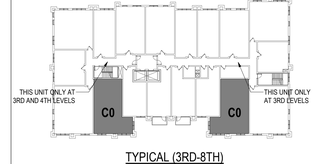
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

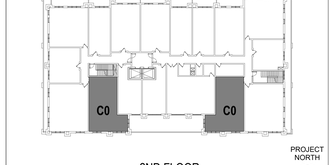
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:
lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

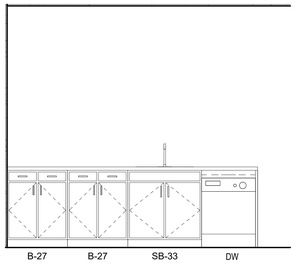
UNIT PLAN (C0)

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	25% DD SUBMISSION	12/13/24

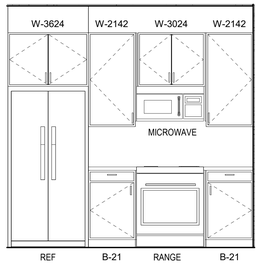
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A-408

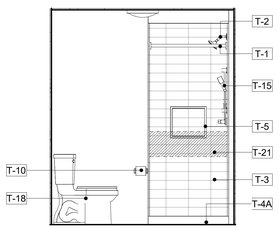
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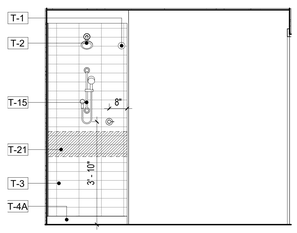
10 A-408A — KITCHEN - ELEVATION 2
Scale: 1/2" = 1'-0"



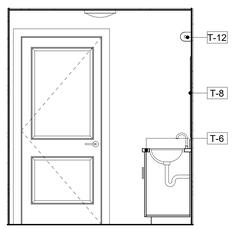
9 A-408A — KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



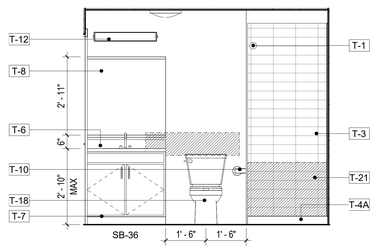
8 A-408A — BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



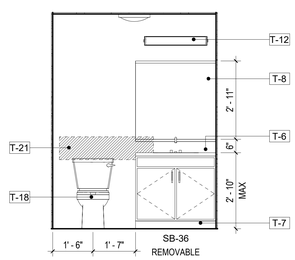
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Scale: 1/2" = 1'-0"



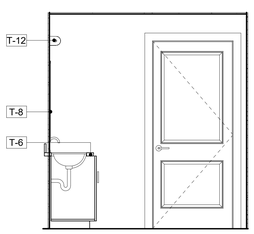
6 A-408A — BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



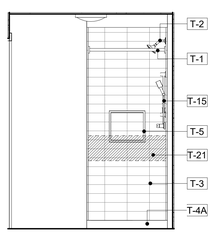
5 A-408A — BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"



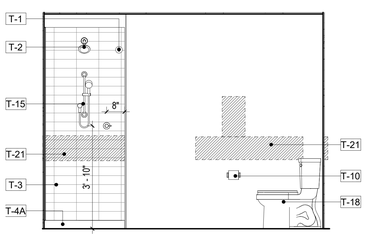
4 A-408A — BATHROOM - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-408A — BATHROOM - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-408A — BATHROOM - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-408A — BATHROOM - ELEVATION 1
Scale: 1/2" = 1'-0"

KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

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2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
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5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
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7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
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14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
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18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
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TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

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BATH TUB CONTROLS	REFER TO G-021 SHEET
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SOAP DISH	4'-0" AFF MAX
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UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
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- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

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4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
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UNIT MECAHNICAL ELEMENTS LEGEND

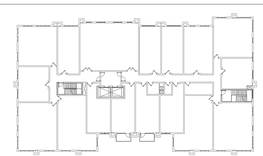
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

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- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

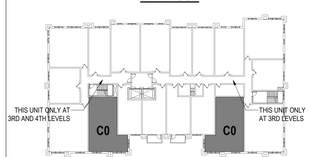
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

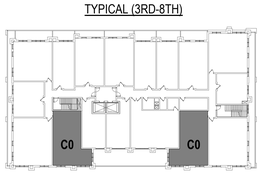
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

ARCHITECT:
lessard DESIGN INC. P.C.
8521 Leesburg Pike | Suite 700 | Vienna, VA 22182
P:571.830.1800 | F:571.830.1801
www.LessardDesign.com

SEAL & SIGNATURE:

OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

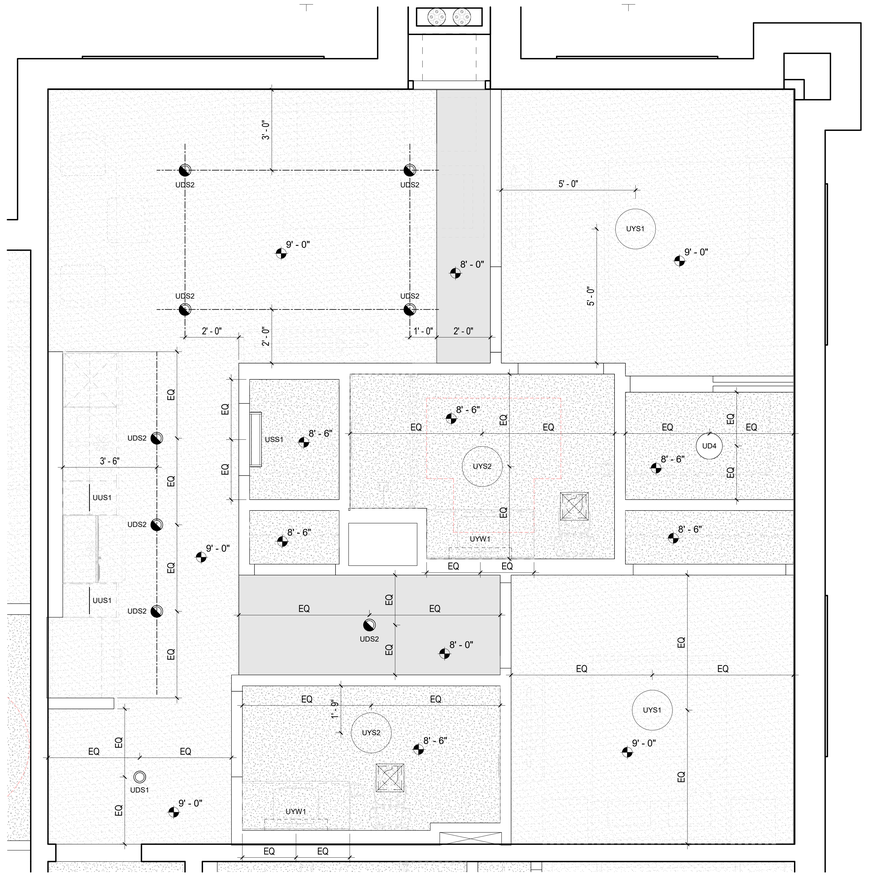
UNIT PLAN (CO)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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CHECKED BY: Checker
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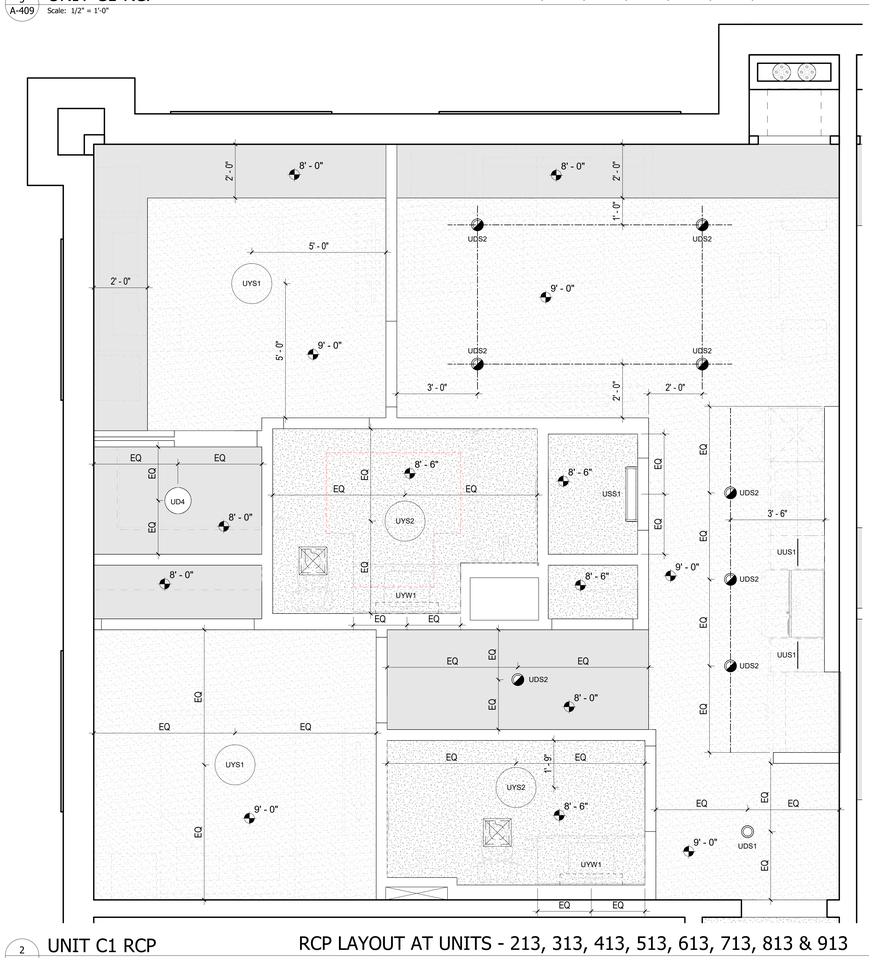
A-408A

Autodesk Docs://Pearl Development - SKC001A - 28 Pearl St/SKC001A - ARCH - 28 Pearl Street.rvt



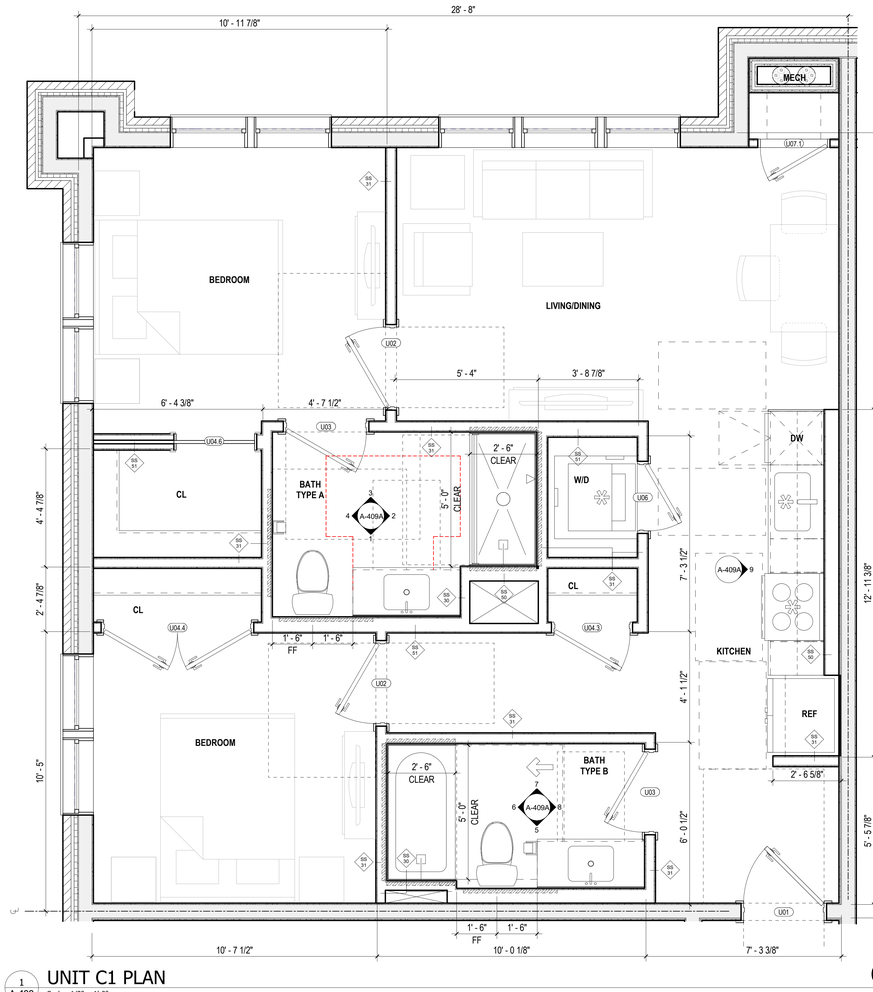
3 A-409 UNIT C1 RCP
Scale: 1/2" = 1'-0"

RCP LAYOUT AT UNITS - 225, 325, 425, 525, 625, 725, 825 & 925



2 A-409 UNIT C1 RCP
Scale: 1/2" = 1'-0"

RCP LAYOUT AT UNITS - 213, 313, 413, 513, 613, 713, 813 & 913



1 A-409 UNIT C1 PLAN
Scale: 1/2" = 1'-0"

(853 SF)

UNIT GENERAL NOTES

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2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF, OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHITNG SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

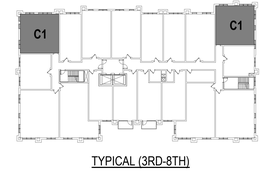
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	USS1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UUS1	KITCHEN UNDER CABINET

KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

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P:571.830.1800 | F:571.830.1801
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28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (C1)

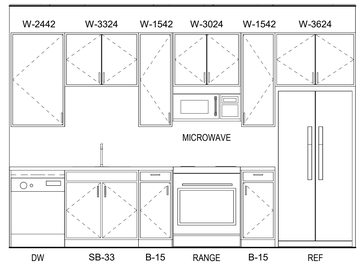
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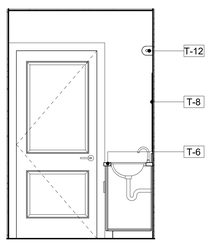
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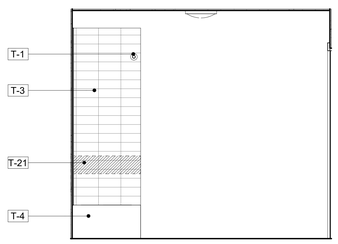
KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT



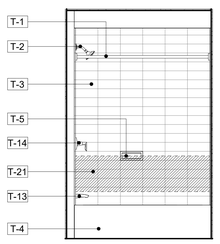
9 A-409A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



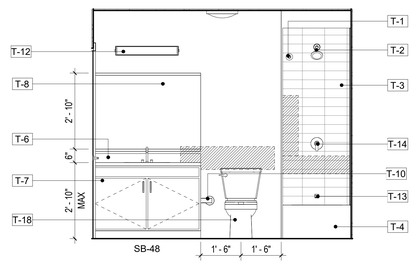
8 A-409A BATHROOM 2 - ELEVATION 4
Scale: 1/2" = 1'-0"



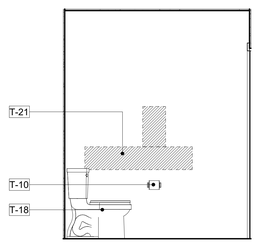
7 A-409A BATHROOM 2 - ELEVATION 3
Scale: 1/2" = 1'-0"



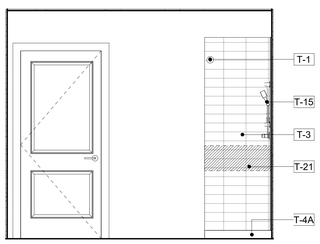
6 A-409A BATHROOM 2 - ELEVATION 2
Scale: 1/2" = 1'-0"



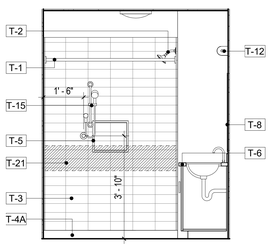
5 A-409A BATHROOM 2 - ELEVATION 1
Scale: 1/2" = 1'-0"



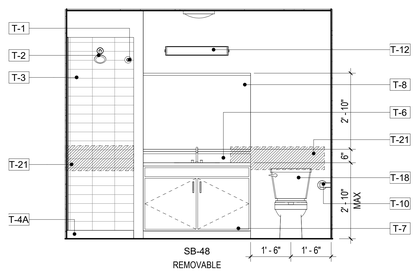
4 A-409A PRIMARY BATH - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-409A PRIMARY BATH - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-409A PRIMARY BATH - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-409A PRIMARY BATH - ELEVATION 1
Scale: 1/2" = 1'-0"

UNIT GENERAL NOTES

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18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
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23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
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26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
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28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
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33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

BEARING WALL
REFER TO STRUCTURAL DWGS.

SHEAR WALL
REFER TO STRUCTURAL DWGS.

NON BEARING WALLS

UNIT RCP LEGEND

GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES

GWB BULKHEAD

GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

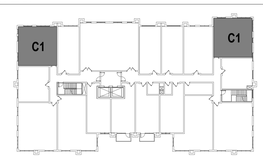
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

SUPPLY DIFFUSER
MECH. EXHAUST FAN
FIRE ALARM DEVICE
SMOKE DETECTOR DEVICE

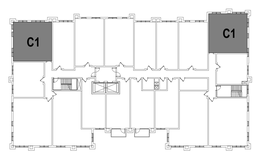
UNIT LIGHTING FIXTURE LEGEND

UDS1	ENTRANCE
UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
UYS1	BEDROOM
UYS2	BATHROOM
UYW1	BATHROOM VANITY TOP
UDP1	KITCHEN PENINSULA
USS1	CLOSET & WASHER DRYER
UD4	WALK IN CLOSET
UUS1	KITCHEN UNDER CABINET

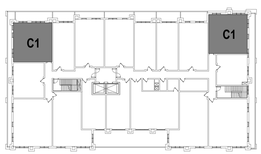
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

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OWNER:
28 PEARL STREET DEVELOPMENT LLC
181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

28 Pearl Street
PORT CHESTER, NY

UNIT PLAN (C1)

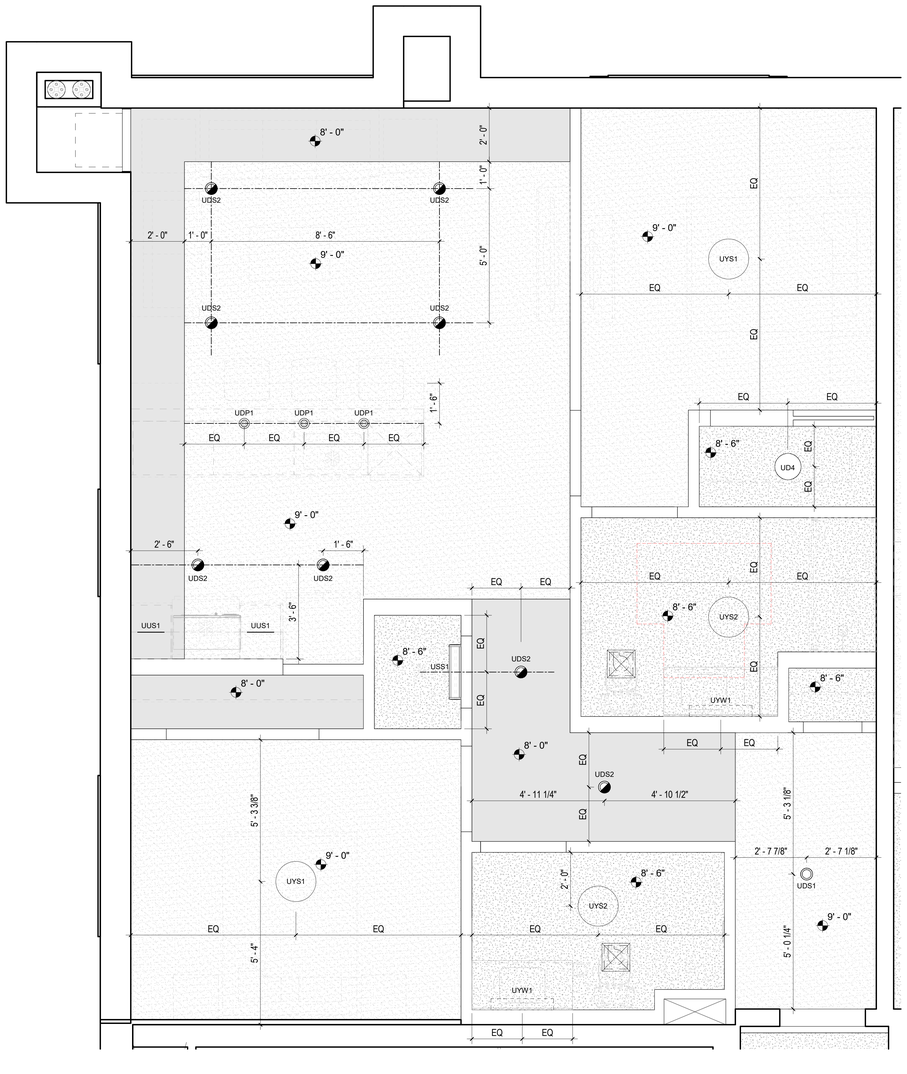
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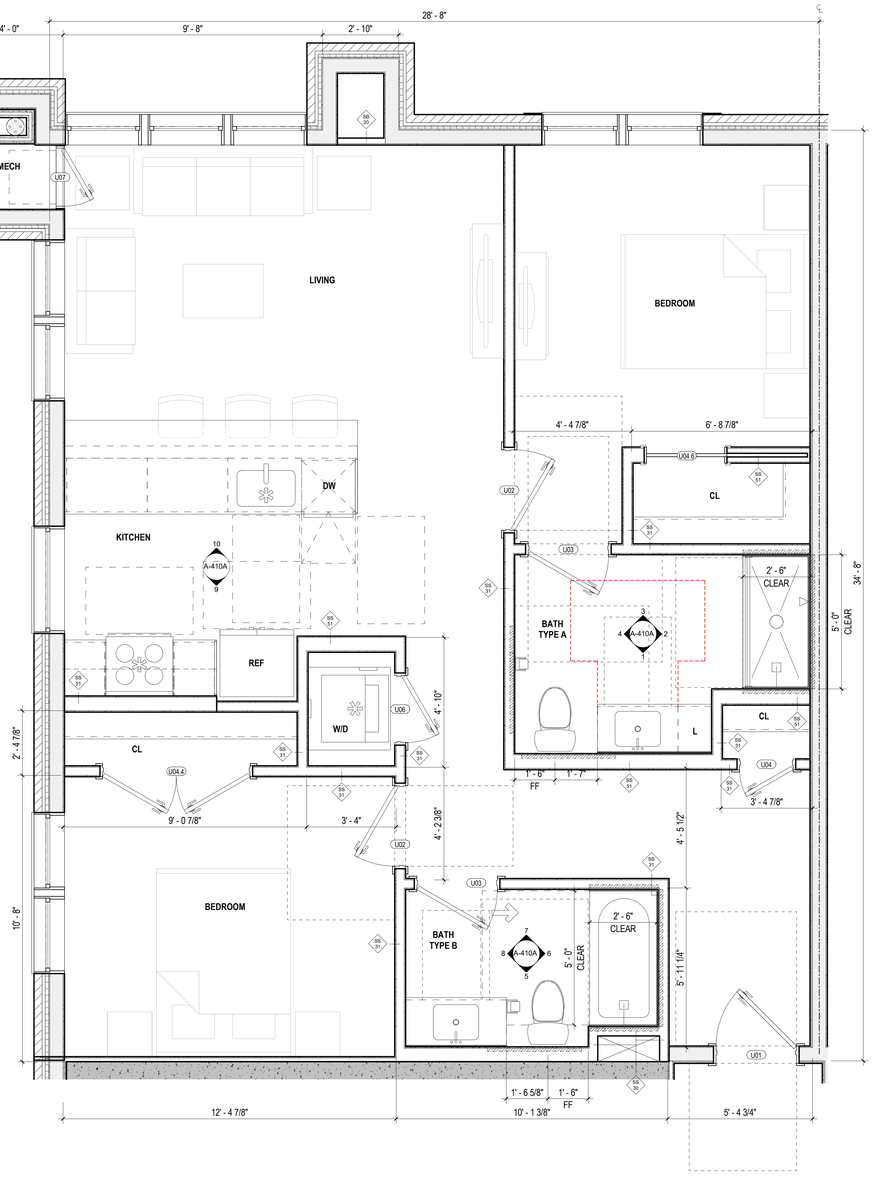
A-409A

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2 A-410 UNIT C2 RCP
Scale: 1/2" = 1'-0"



1 A-410 UNIT C2 PLAN
Scale: 1/2" = 1'-0"

(1026 SF)

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16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF, OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES, JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

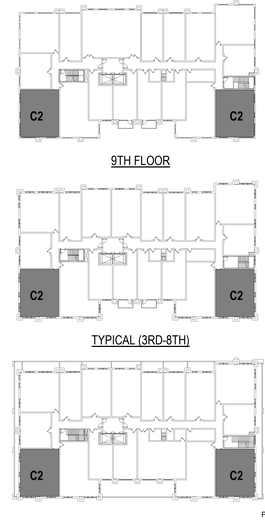
NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

UNIT LIGHTING FIXTURE LEGEND

UDS1	ENTRANCE
UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
UYS1	BEDROOM
UYS2	BATHROOM
UYW1	BATHROOM VANITY TOP
UDP1	KITCHEN PENINSULA
USS1	CLOSET & WASHER DRYER
UD4	WALK IN CLOSET
UUS1	KITCHEN UNDER CABINET

KEYPLAN



PROJECT NORTH

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28 Pearl Street
PORT CHESTER, NY

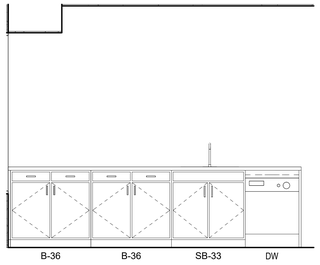
UNIT PLAN (C2)

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	25% DD SUBMISSION	12/13/24

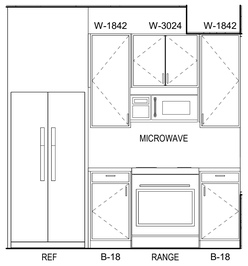
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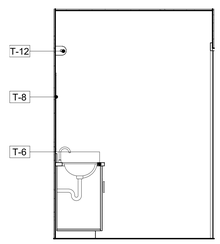
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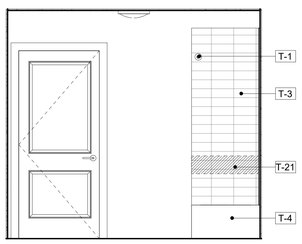
10 A-410A KITCHEN - ELEVATION 2
Scale: 1/2" = 1'-0"



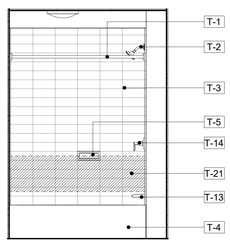
9 A-410A KITCHEN - ELEVATION 1
Scale: 1/2" = 1'-0"



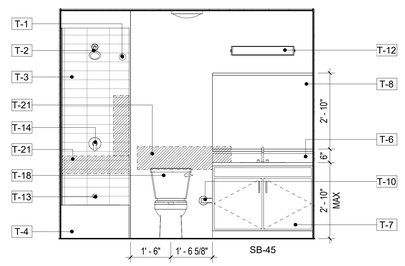
8 A-410A BATHROOM 2 - ELEVATION 4
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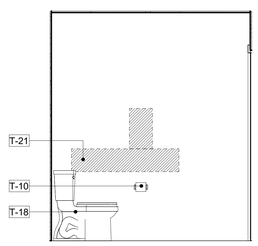
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Scale: 1/2" = 1'-0"



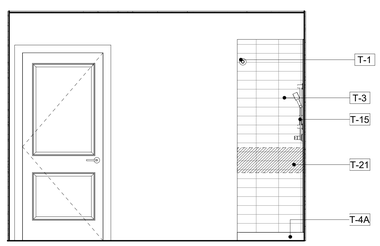
6 A-410A BATHROOM 2 - ELEVATION 2
Scale: 1/2" = 1'-0"



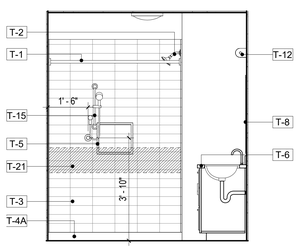
5 A-410A BATHROOM 2 - ELEVATION 1
Scale: 1/2" = 1'-0"



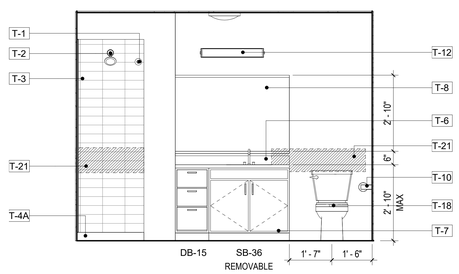
4 A-410A PRIMARY BATH - ELEVATION 4
Scale: 1/2" = 1'-0"



3 A-410A PRIMARY BATH - ELEVATION 3
Scale: 1/2" = 1'-0"



2 A-410A PRIMARY BATH - ELEVATION 2
Scale: 1/2" = 1'-0"



1 A-410A PRIMARY BATH - ELEVATION 1
Scale: 1/2" = 1'-0"

KEYNOTE LEGEND	
VALUE	DESCRIPTION
T-1	SHOWER CURTAIN ROD
T-2	SHOWER HEAD
T-3	TILE: REF: UNIT FURNISHINGS SHEET
T-4	TUB: REF: UNIT FURNISHINGS SHEET
T-4A	SHOWER: REF: UNIT FURNISHINGS SHEET
T-5	24"W X 12"H SHOWER NICHE: UNIT FURNISHINGS SHEET
T-6	SOLID COUNTERTOP VANITY; REF: UNIT FURNISHINGS SHEET
T-7	VANITY SINK BASE; REF: UNIT FURNISHINGS SHEET
T-8	MIRROR; REF: UNIT FURNISHINGS SHEET
T-10	TOILET PAPER DISPENSER
T-12	LIGHT FIXTURE; REF: ELEC AND UNIT FURNISHINGS SHEET
T-13	TUB SPOUT
T-14	DIVERTER
T-15	HAND HELD SHOWER
T-18	WATER CLOSET
T-21	PROVIDE REINFORCING FOR GRAB BAR & SHOWER SEAT

UNIT GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE (U.N.O.).
2. ALL UNIT INTERIOR PARTITIONS ARE TYPE-SS31 UNLESS NOTED OTHERWISE (U.N.O.). REFER TO SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
3. FOR EXTERIOR, CORRIDOR AND DEMISING WALLS REFER TO OVERALL FLOOR PLANS AND SHEET G-030 FOR TYPICAL PARTITION ASSEMBLIES & NOTES.
4. REFER TO BUILDING ELEVATIONS FOR EXTERIOR WINDOW TYPES.
5. REFER TO FLOOR PLANS FOR DIMENSIONS & LOCATIONS OF EXTERIOR WALLS, WINDOWS & DOOR.
6. PROVIDE SHOWER ROD AT TUB COMPARTMENT.
7. PROVIDE CONCEALED FIRE-TREATED WOOD OR METAL BLOCKING IN ALL UNITS AT THE FOLLOWING LOCATIONS: PARTITION-MOUNTED EQUIPMENT, FIXTURES, MILLWORK, CURRENT & PLANNED GRAB BARS, AND SHOWER SEAT LOCATIONS. REFER TO ANSI SHEETS FOR TYPICAL GRAB BAR / SHOWER SEAT BLOCKING DIAGRAMS.
8. REFER TO ANSI SHEET FOR ALLOWABLE HEIGHTS FOR UNIT OPERABLE PARTS. OPERABLE PARTS INCLUDES LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, ELECTRICAL PANEL BOARDS, SECURITY AND INTERCOM SYSTEMS, ETC.
9. REFER TO ANSI SHEET FOR STRUCTURAL STRENGTH REQUIREMENTS FOR UNIT FIXED ELEMENTS SUCH AS TOWEL BARS, SOAP DISHES, ETC.
10. GC TO COORDINATE THAT FINAL SELECTION OF UNIT FIXTURES AND FITTINGS FOR KITCHENS, BATHROOMS AND LAUNDRY MEETS ACCESSIBILITY REQUIREMENTS INDICATED ON ANSI SHEET
11. ALL UNITS TO BE EQUIPPED WITH ACCESSIBLE COMMUNICATION FEATURES PER 2009 ANSI 117.1 1006 and BCNYS 907.5.2.3.3 Group R-2
12. SINK BOWL FOR VANITIES IN ALL UNIT BATHROOMS SHALL BE PLACED AS INDICATED ON PLANS. HAND OPERATED TOILET FLUSH CONTROLS SHALL BE LOCATED AT THE OPEN SIDE OF THE WATER CLOSET.
13. ALL EXPOSED CABINETRY TO HAVE FINISHED ENDS.
14. ALL UNIT BATHROOMS TO HAVE MARBLE THRESHOLD.
15. ALL UNIT WALL BASE TO BE 6" HIGH, FLAT STOCK FJ PRIME.
16. ALL INTERIOR DOOR CASING TO BE 4", FLAT STOCK FJ PRIME.
17. CORRIDOR DOORS SHALL TYPICALLY BE CENTERED WITHTIN CORRIDOR U.N.O.
18. INTERIOR DOOR INSIDE FACE OF HINGE-SIDE JAMB SHALL BE 4" FROM FACE OF ADJACENT INTERSECTING PARTITION, U.N.O.
19. ALL DUCTWORK & PIPING SHALL BE INSULATED IN UNCONDITIONED AREAS. SEE ALSO MECH. DWGS.
20. GC TO COORDINATE ACCESS PANELS, CEILING MOUNTED DEVICES WITH MEP DRAWINGS.
21. UNDERSIDE OF WALL CABINETS SHALL BE FINISHED.
22. PROVIDE FULL HEIGHT BACKSPLASH IN KITCHEN. REFER TO ID SCHEDULE FOR FINISH. NO SIDE SPLASH.
23. PROVIDE 4" HIGH BACK SPLASH IN BATHROOM. REFER TO ID SCHEDULE FOR FINISH.
24. CABINET DOORS TO BE AS SHOWN ON ID FINISH SCHEDULE. REFER TO ID SCHEDULE FOR CABINET HARDWARE & FINISH.
25. AIR SWITCH FOR GARBAGE DISPOSAL TO BE LOCATED ON COUNTERTOP ADJACENT TO KITCHEN FAUCET. FINISH TO MATCH FAUCET.
26. WHERE REFRIGERATOR IS EXPOSED, PROVIDE FULL HEIGHT FINISHED SIDE PANEL.
27. WHERE BASE CABINETS ARE NOTED TO BE REMOVEABLE, EXTEND FINISH UNDER BASE CABINET TO WALL. PROVIDE DIMMER SWITCH IN KITCHEN, DINING AND LIVING ROOMS.
28. SHOWER USE TILE REDI PRODUCTS AS BASIS OF DESIGN.
29. FOR KITCHEN AND BATHROOM CABINETS, PROVIDE SOFT CLOSE.
30. AT KITCHEN COUNTERTOPS PROVIDE EASE EDGE FINISH. U.N.O. REFER TO ID FINISH SCHEDULE.
31. FOR FLOOR FINISH TRANSITION DETAIL REFER TO DOOR SCHEDULE & ID DRAWINGS.
32. PROVIDE BEHIND THE WALL BLOCKING FOR FUTURE INSTALLATION OF HAND HELD SHOWER BAR.
33. CENTER LIGHT FIXTURE IN WALK-IN CLOSETS, U.N.O.

TYPICAL MOUNTING HEIGHTS AT UNIT BATHROOMS

SHOWER HEAD	7'-0" AFF. OWNER TO CONFIRM
SHOWER CONTROLS	REFER TO G-021 SHEET
BATH TUB CONTROLS	REFER TO G-021 SHEET
VANITY LIGHTS	AS DIRECTED BY OWNER
TOWEL BARS/RINGS/HOOKS	4'-0" AFF
GRAB BARS AND FOLDING SEAT	REFER TO ANSI SHEET
MIRROR AT VANITY	3'-4" MAX AFF (BOTTOM OF REFLECTING SURFACE)
SOAP DISH	4'-0" AFF MAX
MEDICINE CABINET	3'-4" AFF (BOTTOM OF REFLECTIVE SURFACE)

UNIT PLAN LEGEND

- BEARING WALL — REFER TO STRUCTURAL DWGS.
- SHEAR WALL — REFER TO STRUCTURAL DWGS.
- NON BEARING WALLS

UNIT RCP LEGEND

- GWB TO UNDERSIDE OF CEILING, REFER TO FLR/CLG AND ROOF/CLG ASSEMBLIES
- GWB BULKHEAD
- GWB SOFFIT OR SUSPENDED GWB

UNIT RCP GENERAL NOTES

1. CENTER FIXTURES. JUNCTION BOXES IN ROOM, U.O.N.
2. REFER TO ELECTRICAL DRAWINGS FOR LIGHITNG SCHEDULE.
3. DIMENSIONS ARE TAKEN FROM FACE OF STUD (FOS) TO CENTERLINE OF FIXTURE U.O.N.
4. HEIGHT OF SCONE AND PENDANTS SHALL BE COORDINATED W/OWNER.
5. WHERE POSSIBLE ALIGN SPRINKLER HEADS WITH CENTERLINE OF NEAREST LIGHT FIXTURE.
6. WHERE FIXTURES ARE IN FRONT OF W/D OR COAT CLOSET CENTER FIXTURE IN OPENING.

UNIT MECAHNICAL ELEMENTS LEGEND

NOTE: REFER TO MECHANICAL DWGS. FOR SIZE & ADDITIONAL INFORMATION

- SUPPLY DIFFUSER
- MECH. EXHAUST FAN
- FIRE ALARM DEVICE
- SMOKE DETECTOR DEVICE

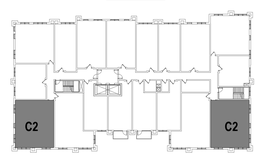
UNIT LIGHTING FIXTURE LEGEND

	UDS1	ENTRANCE
	UDS2	KITCHEN, LIVING ROOM & UNIT CORRIDOR
	UYS1	BEDROOM
	UYS2	BATHROOM
	UYW1	BATHROOM VANITY TOP
	UDP1	KITCHEN PENINSULA
	US$1	CLOSET & WASHER DRYER
	UD4	WALK IN CLOSET
	UU$1	KITCHEN UNDER CABINET

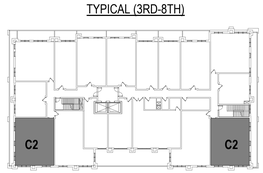
KEYPLAN



9TH FLOOR



TYPICAL (3RD-8TH)



2ND FLOOR

PROJECT NORTH

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28 Pearl Street
PORT CHESTER, NY

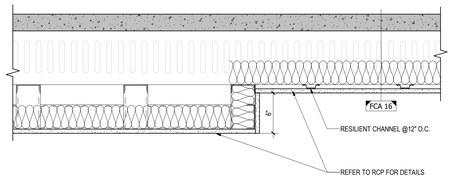
UNIT PLAN (C2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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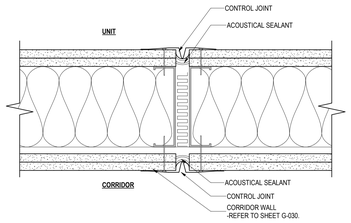
A-410A

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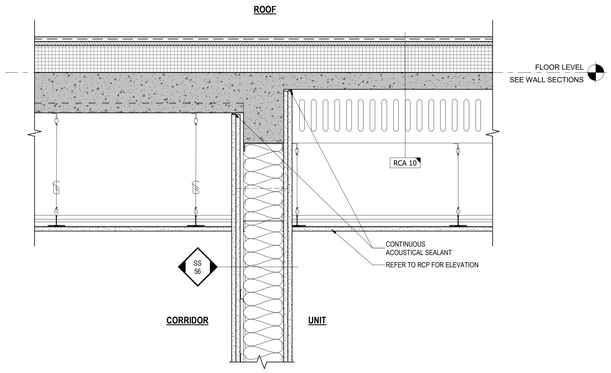
7 / A-500 TYPICAL UNIT BULKHEAD/SOFFIT DETAIL

Scale: 1 1/2" = 1'-0"



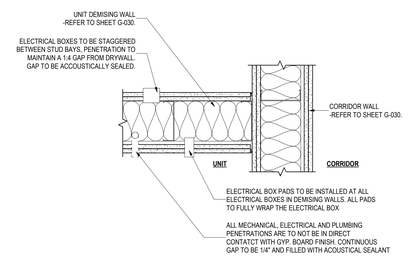
6 / A-500 PLAN AT TYPICAL CONTROL JOINT1

Scale: 3" = 1'-0"



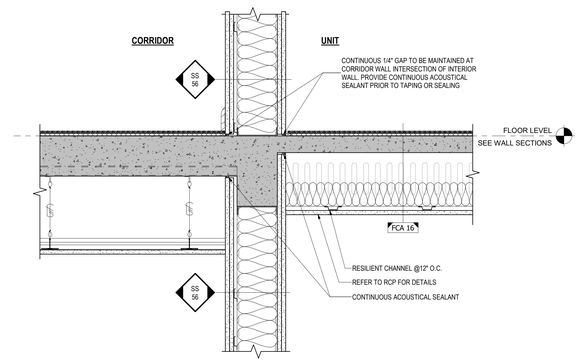
3 / A-500 CORRIDOR WALL AT ROOF

Scale: 1 1/2" = 1'-0"



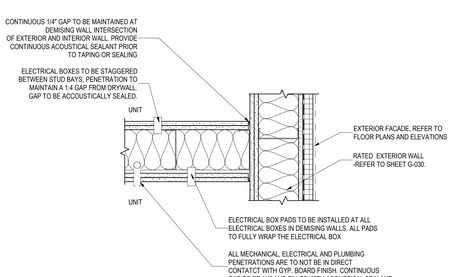
5 / A-500 TYPICAL SOUND DETAIL AT DEMISING CORRIDOR WALL

Scale: 1 1/2" = 1'-0"



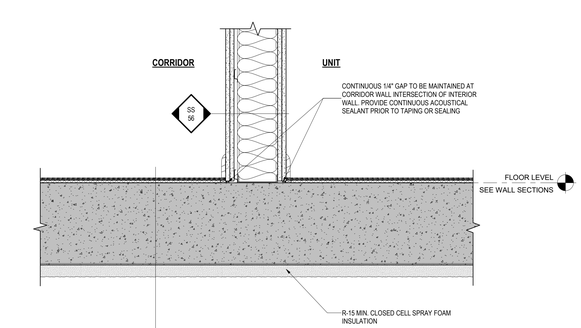
2 / A-500 CORRIDOR WALL AT FLR-CLNG ASSEMBLY

Scale: 1 1/2" = 1'-0"



4 / A-500 TYPICAL SOUND DETAIL AT UNIT

Scale: 1 1/2" = 1'-0"



1 / A-500 PODIUM SLAB DETAIL UNDER CONDITIONED SPACE

Scale: 1 1/2" = 1'-0"

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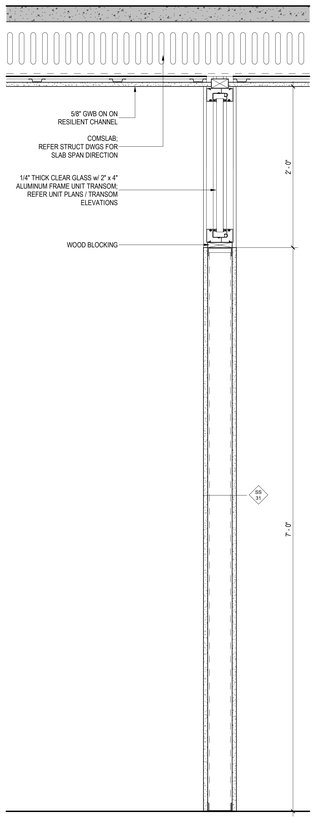
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NO.	DESCRIPTION	DATE
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DRAWN BY:		Author
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PLOT DATE:		2/7/2025 10:14:50 AM
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A-500

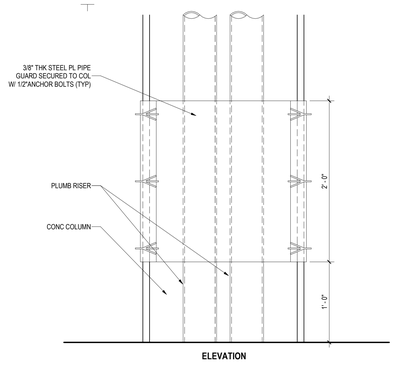
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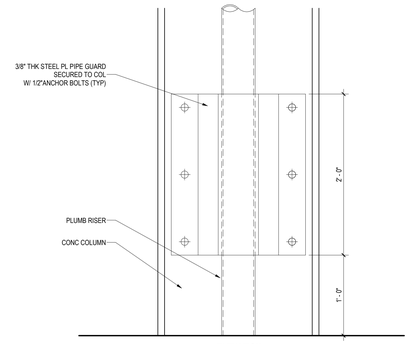


15 A-510 TYPICAL UNIT TRANSOM DETAIL

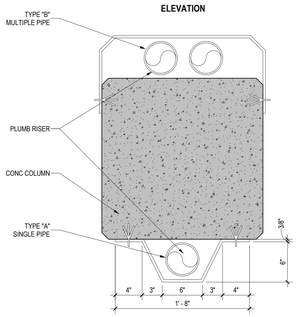
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ELEVATION



ELEVATION



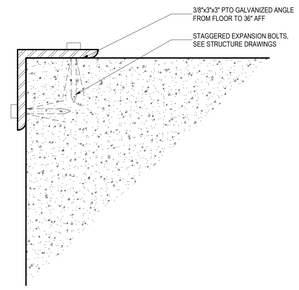
PLAN

NOTE :

THIS CONDITIONS TO BE USED AT ALL PIPE LOCATIONS WITHIN GARAGE. COORDINATE WITH ALL TRADES.

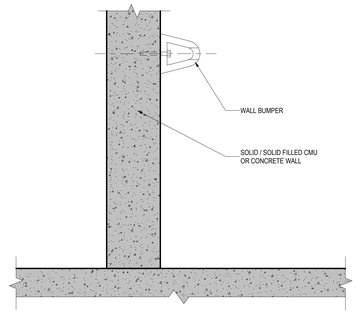
12 A-510 PIPE GUARD DETAIL

Scale: 1 1/2" = 1'-0"



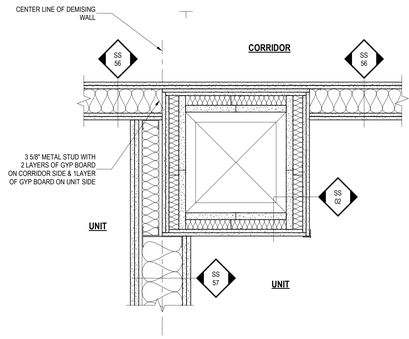
9 A-510 COL PROTECTION DETAIL (CORNER GUARD)

Scale: 6" = 1'-0"



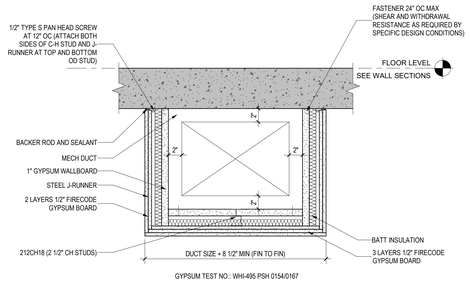
8 A-510 TYPICAL WALL BUMPER DETAIL

Scale: 1 1/2" = 1'-0"



5 A-510 PLAN AT SHAFT OPT AT CORRIDOR & DEMISING WALL

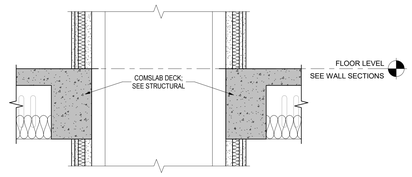
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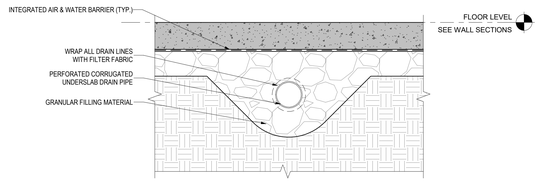
4 A-510 TYP 2 HR RATED HORIZONTAL DUCT ENCLOSURE

Scale: 1 1/2" = 1'-0"



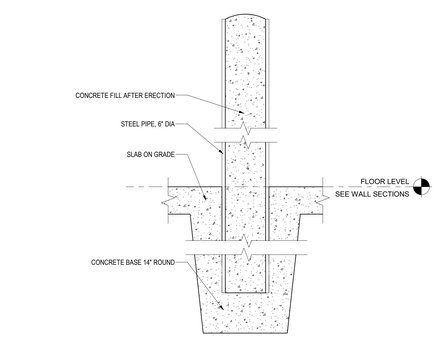
3 A-510 TYPICAL VERTICAL SHAFT SECTION DETAIL

Scale: 1 1/2" = 1'-0"



2 A-510 TYPICAL UNDERSLAB DRAINAGE DETAIL

Scale: 1 1/2" = 1'-0"

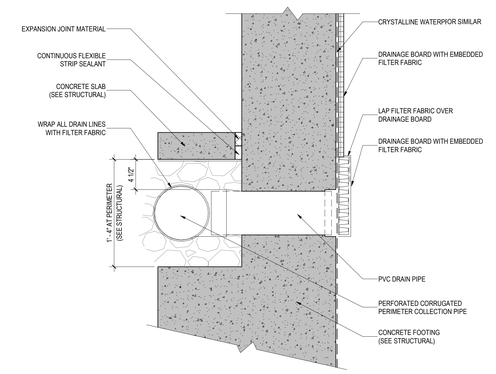


7 A-510 TYPICAL BOLLARD DETAIL AT STRUCTURAL SLAB

Scale: 1 1/2" = 1'-0"

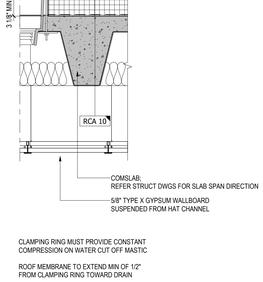
6 A-510 TYPICAL BOLLARD DETAIL AT SLAB ON GRADE

Scale: 1 1/2" = 1'-0"



1 A-510 TYPICAL PERIMETER DRAINAGE DETAIL

Scale: 1 1/2" = 1'-0"

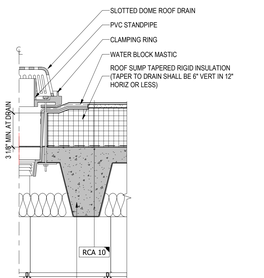


CLAMPING RING MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT OFF MASTIC

ROOF MEMBRANE TO EXTEND MIN OF 1/2" FROM CLAMPING RING TOWARD DRAIN

14 A-510 ROOF OVERFLOW DRAIN DETAIL

Scale: 1 1/2" = 1'-0"

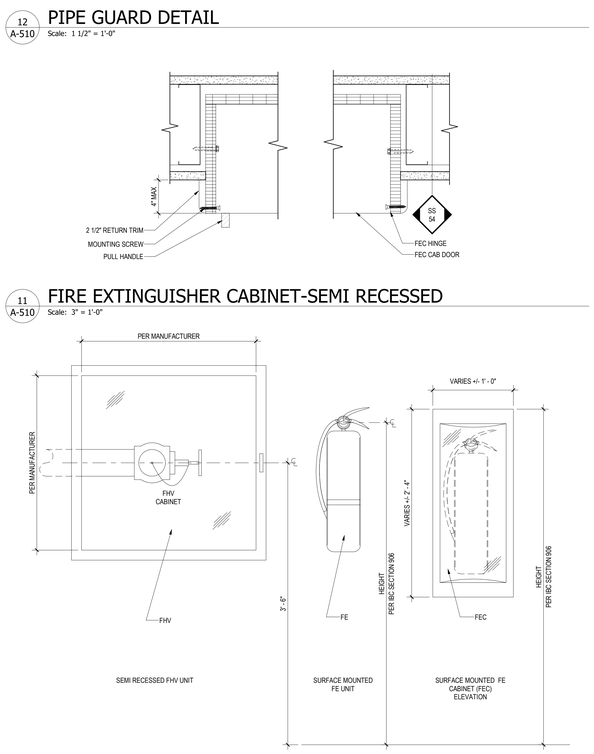


CLAMPING RING MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT OFF MASTIC

ROOF MEMBRANE TO EXTEND MIN OF 1/2" FROM CLAMPING RING TOWARD DRAIN

13 A-510 ROOF DRAIN DETAIL

Scale: 1 1/2" = 1'-0"



SEMI RECESSED FHV UNIT

SURFACE MOUNTED FE UNIT

SURFACE MOUNTED FE CABINET (FEC) ELEVATION

10 A-510 FHV AND FIRE EXTINGUISHERS

Scale: 1 1/2" = 1'-0"

11 A-510 FIRE EXTINGUISHER CABINET-SEMI RECESSED

Scale: 3" = 1'-0"

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TYPICAL DETAILS

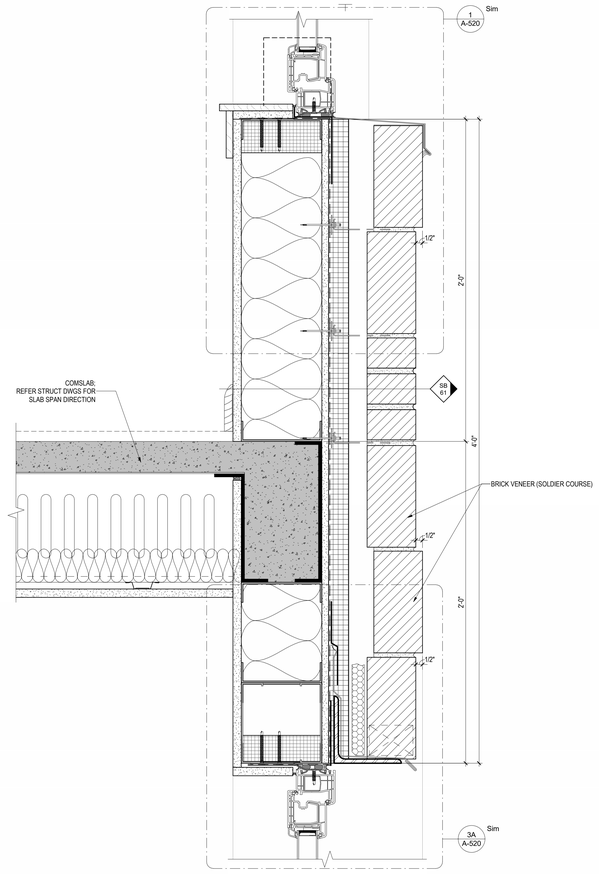
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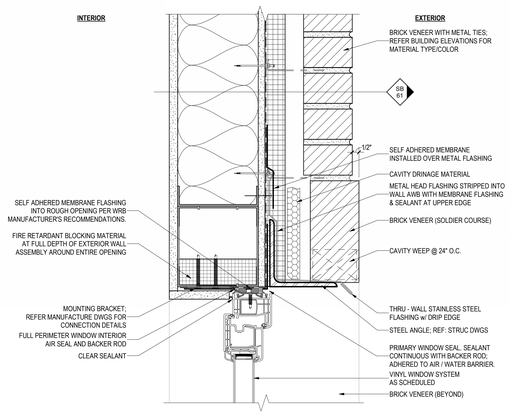
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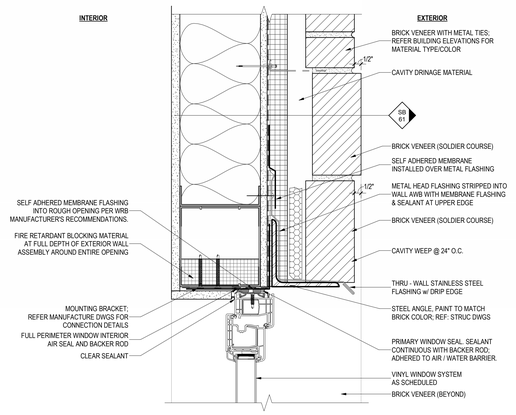
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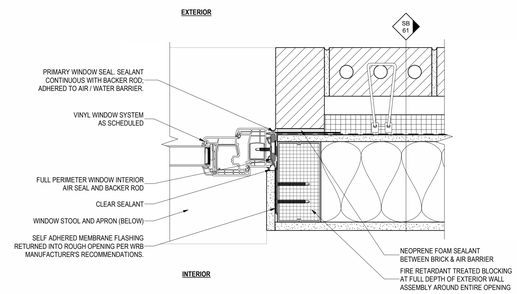
4 A-520 VINYL WINDOW HEAD / SILL @ R7 (BRICK BAND)
Scale: 3" = 1'-0"



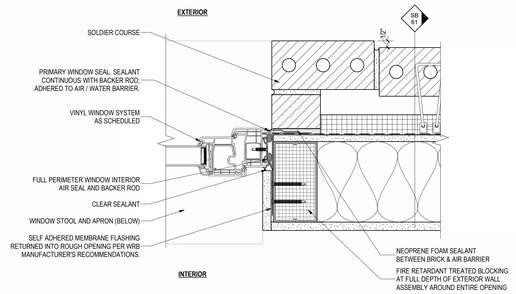
3B A-520 VINYL WINDOW HEAD 2 @ BRICK VENEER
Scale: 3" = 1'-0"



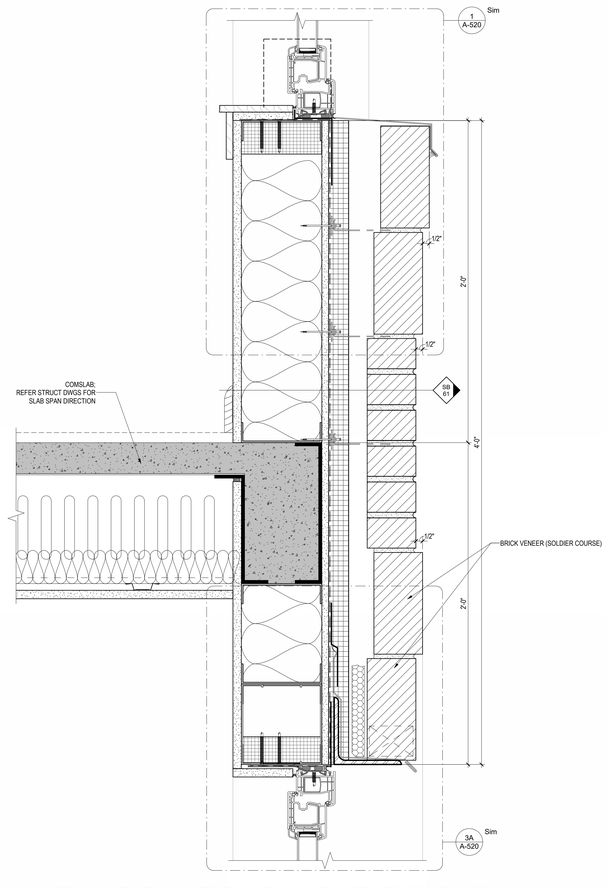
3A A-520 VINYL WINDOW HEAD 1 @ BRICK VENEER
Scale: 3" = 1'-0"



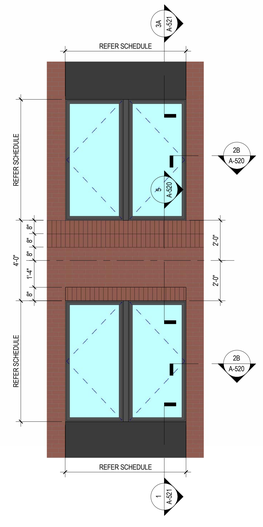
2B A-520 VINYL WINDOW JAMB 2 @ BRICK VENEER
Scale: 3" = 1'-0"



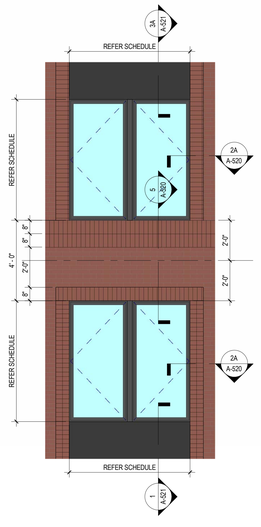
2A A-520 VINYL WINDOW JAMB 1 @ BRICK VENEER
Scale: 3" = 1'-0"



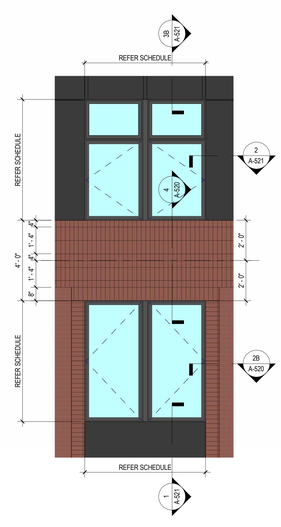
5 A-520 VINYL WINDOW HEAD / SILL @ R3/R5 (BRICK BAND)
Scale: 3" = 1'-0"



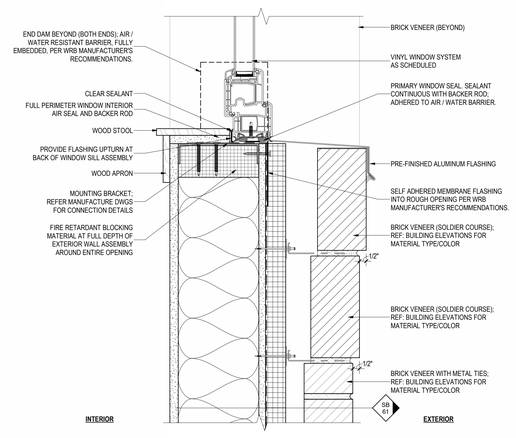
WINDOW CONDITION 3



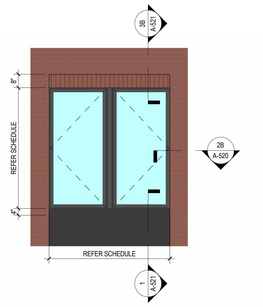
WINDOW CONDITION 6



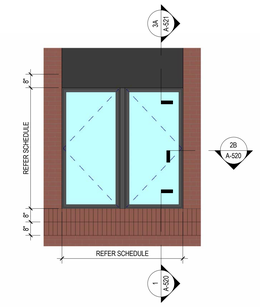
WINDOW CONDITION 5



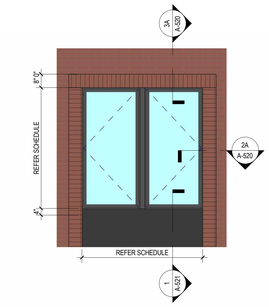
1 A-520 VINYL WINDOW SILL @ BRICK VENEER
Scale: 3" = 1'-0"



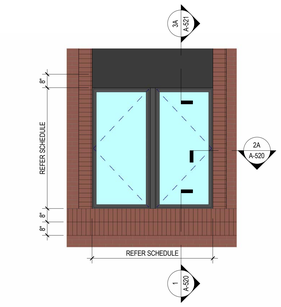
WINDOW CONDITION 4



WINDOW CONDITION 3



WINDOW CONDITION 2



WINDOW CONDITION 1

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181 Westchester Avenue, Suite 301A
Port Chester, NY 10573

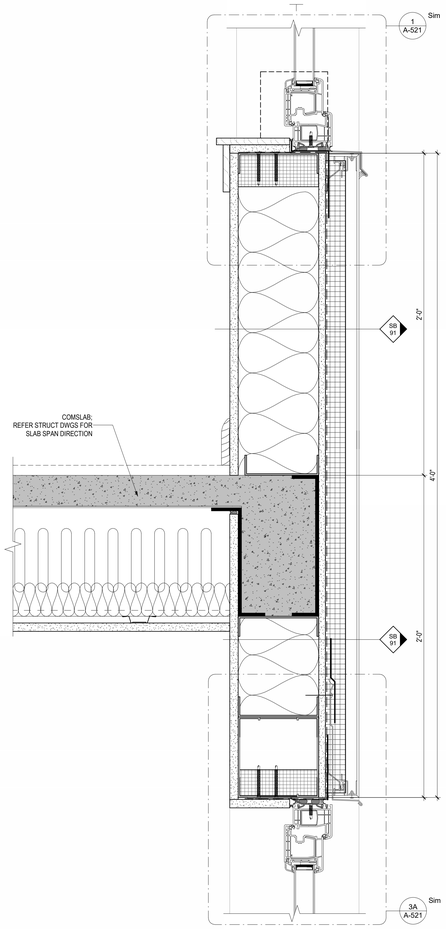
28 Pearl Street
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TYPICAL WINDOW DETAILS @ BRICK VENEER

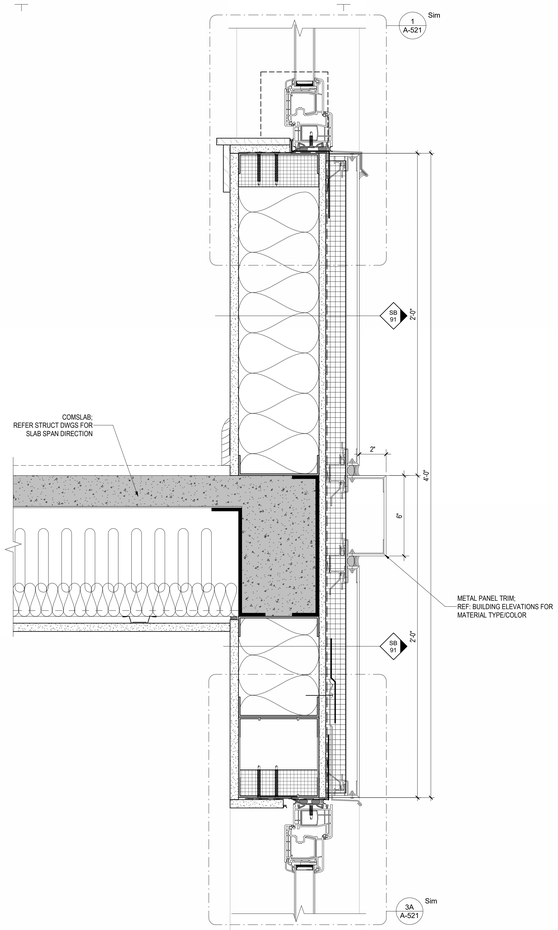
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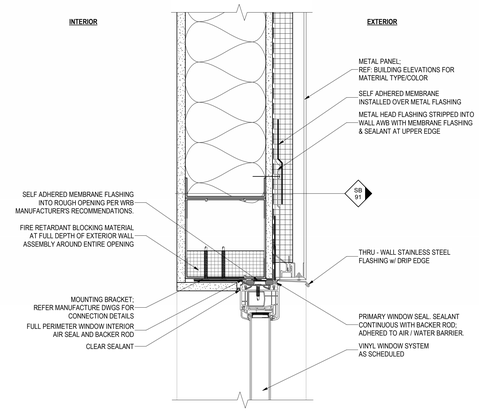
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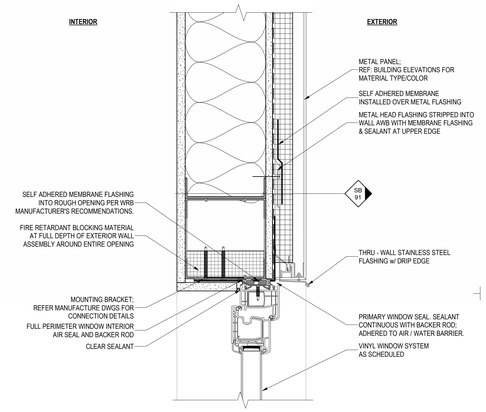
5 A-521 ALUMINUM WINDOW HEAD / SILL @ R7 (WO/METAL PANEL TRIM)
Scale: 3" = 1'-0"



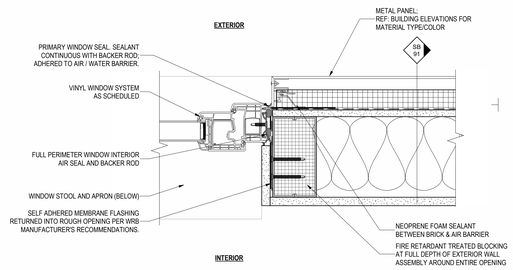
4 A-521 ALUMINUM WINDOW HEAD / SILL @ R7 (W/METAL PANEL TRIM)
Scale: 3" = 1'-0"



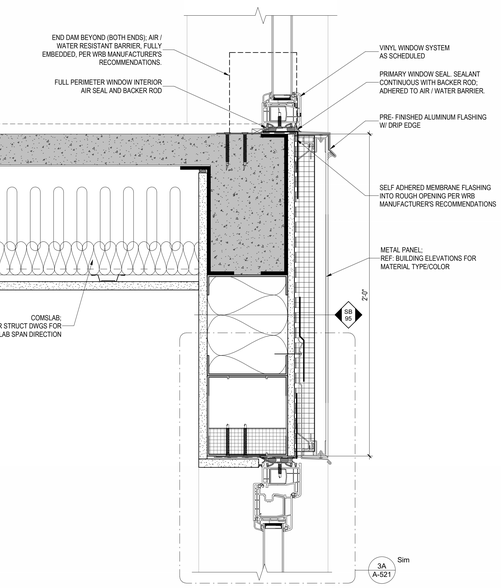
3B A-521 VINYL WINDOW HEAD 2 @ METAL PANEL
Scale: 3" = 1'-0"



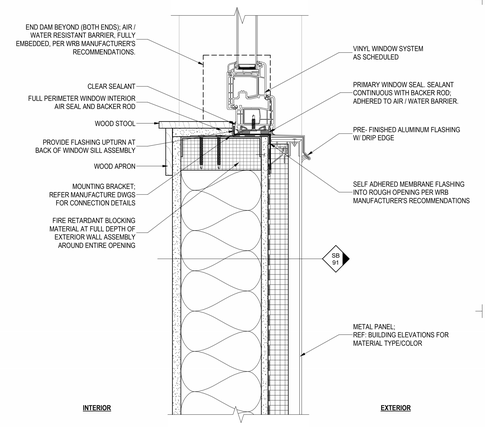
3A A-521 VINYL WINDOW HEAD 1 @ METAL PANEL
Scale: 3" = 1'-0"



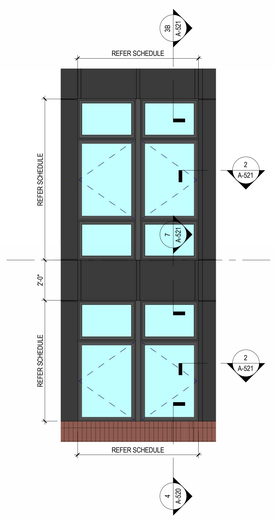
2 A-521 VINYL WINDOW JAMB @ METAL PANEL
Scale: 3" = 1'-0"



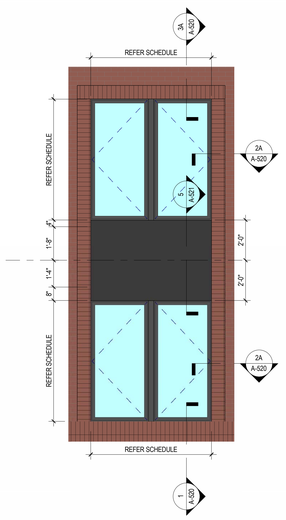
6 A-521 VINYL WINDOW HEAD / SILL @ R7 (WO/METAL PANEL TRIM)
Scale: 3" = 1'-0"



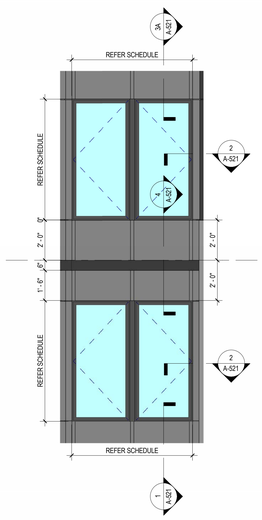
1 A-521 VINYL WINDOW SILL @ METAL PANEL
Scale: 3" = 1'-0"



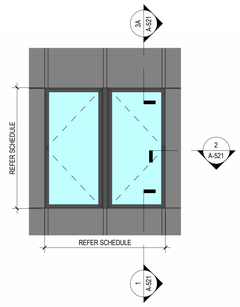
WINDOW CONDITION 4



WINDOW CONDITION 3



WINDOW CONDITION 2



WINDOW CONDITION 1

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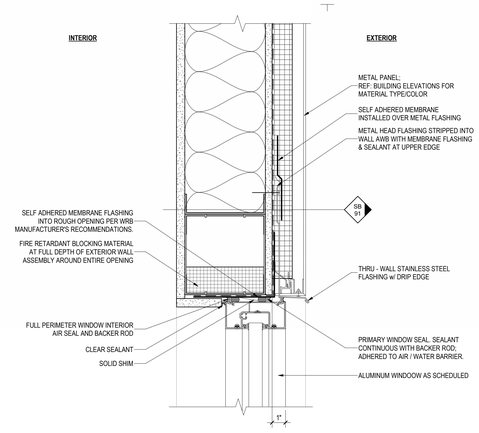
28 Pearl Street
PORT CHESTER, NY

TYPICAL WINDOW DETAILS @ METAL PANEL

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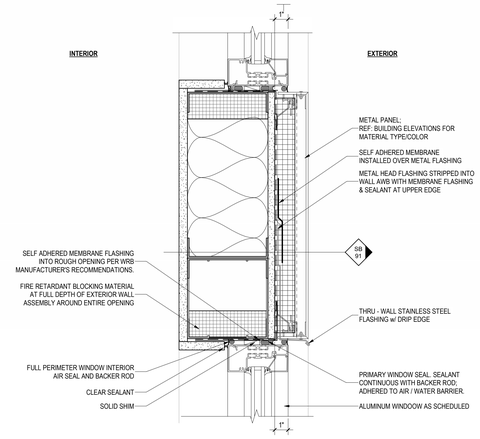
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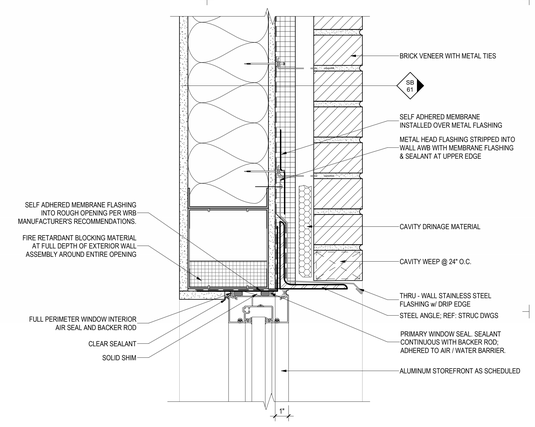
7 A-522 ALUMINUM STOREFRONT HEAD @ METAL PANEL

Scale: 3" = 1'-0"



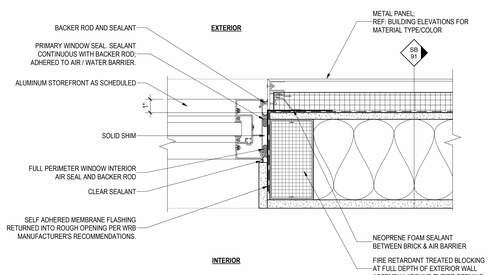
4 A-522 ALUMINUM STOREFRONT CONNECTION DETAIL @ METAL PANEL

Scale: 3" = 1'-0"



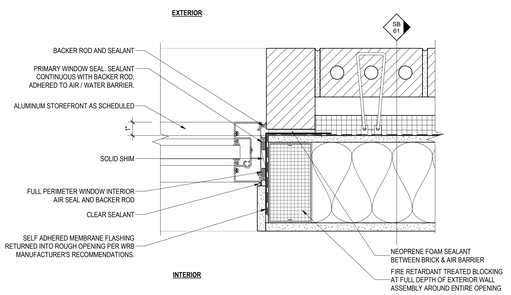
3A A-522 ALUMINUM STOREFRONT HEAD @ BRICK VENEER

Scale: 3" = 1'-0"



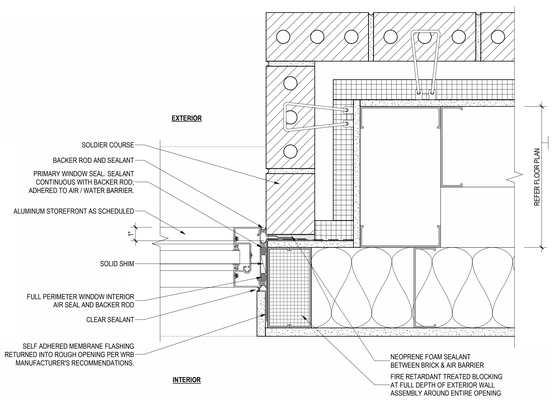
6 A-522 ALUMINUM STOREFRONT JAMB @ METAL PANEL

Scale: 3" = 1'-0"



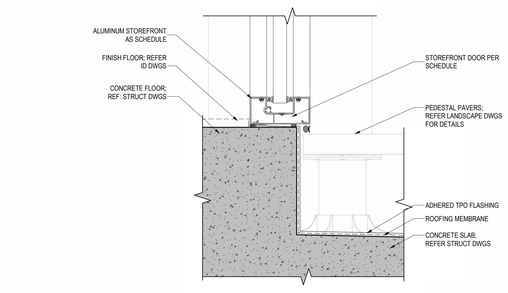
2B A-522 ALUMINUM STOREFRONT JAMB 2 @ BRICK VENEER

Scale: 3" = 1'-0"



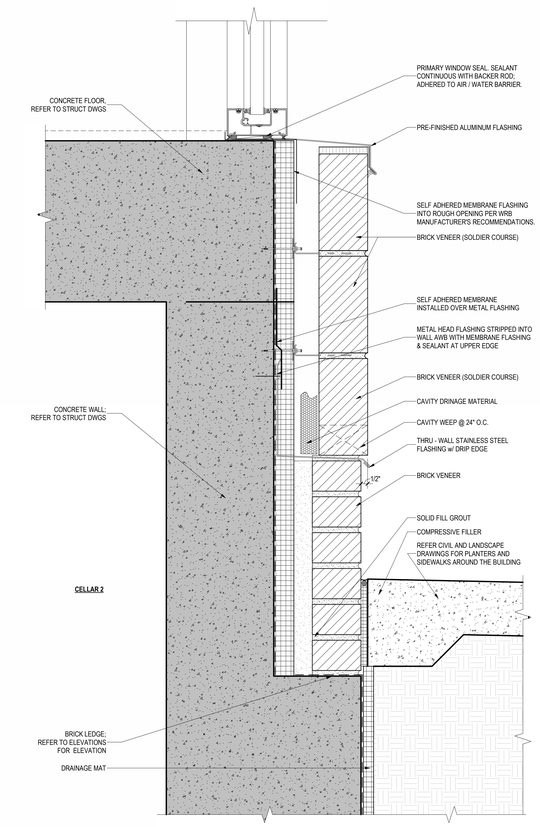
2A A-522 ALUMINUM STOREFRONT JAMB 1 @ BRICK VENEER

Scale: 3" = 1'-0"



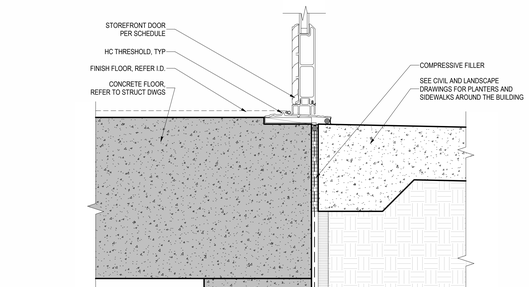
5 A-522 ALUMINUM STOREFRONT DOOR SILL @ R1

Scale: 3" = 1'-0"



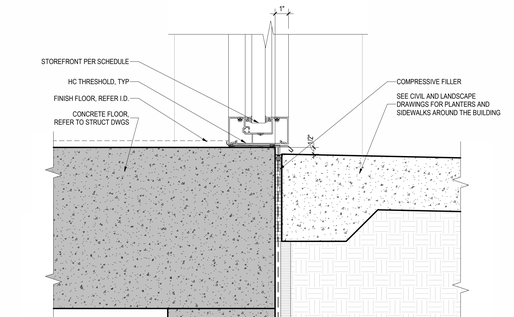
1C A-522 ALUMINUM STOREFRONT SILL @ LOBBY/LEASING/MAIL ROOM

Scale: 3" = 1'-0"



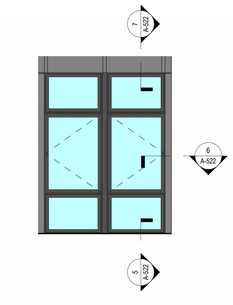
1B A-522 ALUMINUM STOREFRONT DOOR SILL @ FLOOR

Scale: 3" = 1'-0"

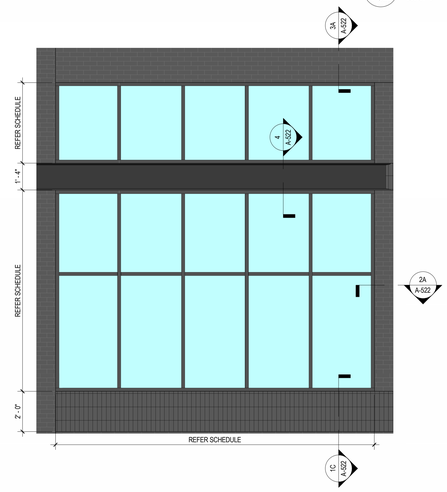


1A A-522 ALUMINUM STOREFRONT SILL @ FLOOR

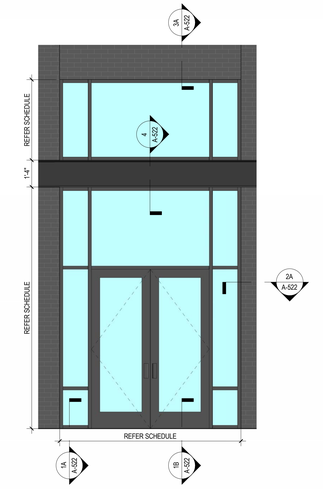
Scale: 3" = 1'-0"



STOREFRONT CONDITION 1 @ METAL PANEL



STOREFRONT CONDITION 2 @ BRICK



STOREFRONT CONDITION 1 @ BRICK

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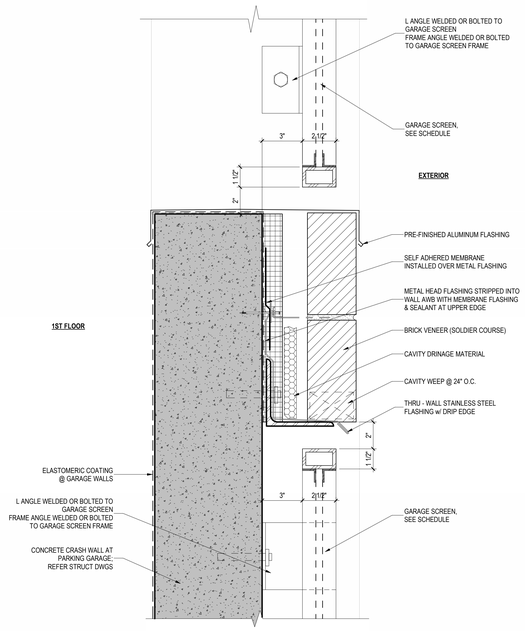
TYPICAL STOREFRONT DETAILS @ BRICK / METAL PANEL

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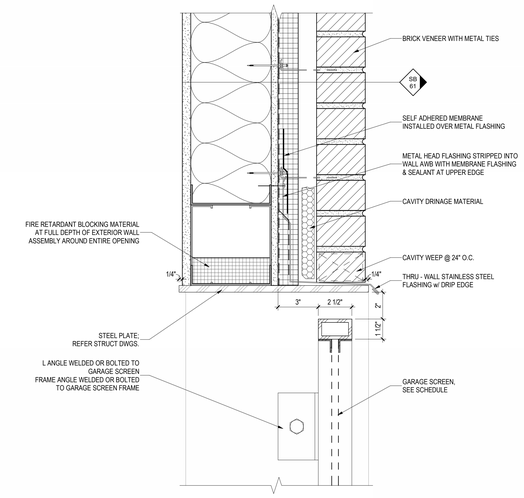
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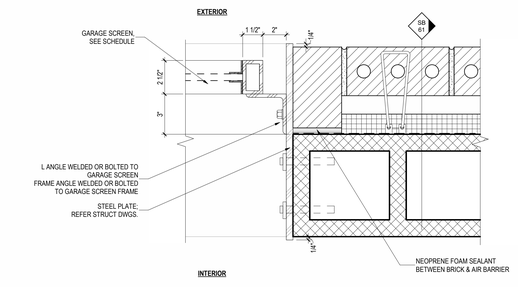
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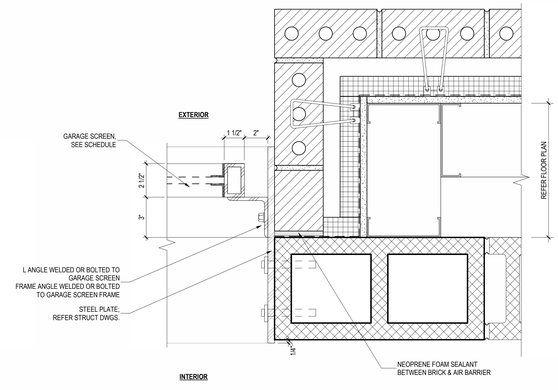
4 A-523 GARAGE SCREEN CONNECTION DETAIL @ BRICK VENEER
Scale: 3" = 1'-0"



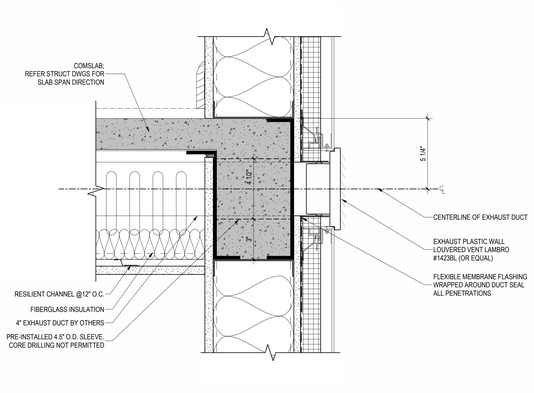
3 A-523 GARAGE SCREEN HEAD @ BRICK VENEER
Scale: 3" = 1'-0"



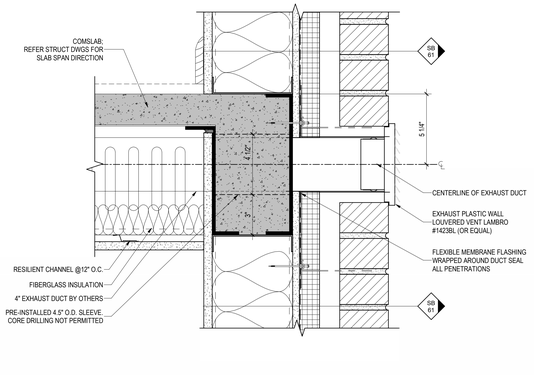
2B A-523 GARAGE SCREEN JAMB 2 @ BRICK VENEER
Scale: 3" = 1'-0"



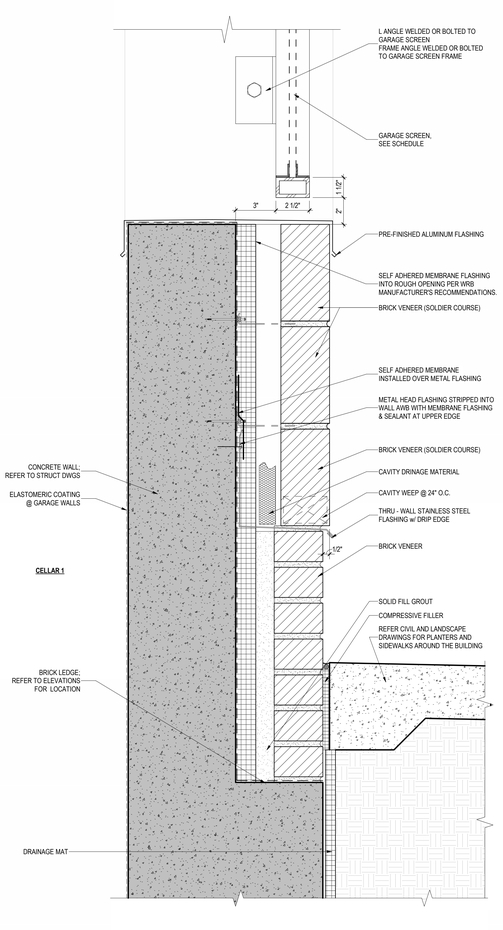
2A A-523 GARAGE SCREEN JAMB 1 @ BRICK VENEER
Scale: 3" = 1'-0"



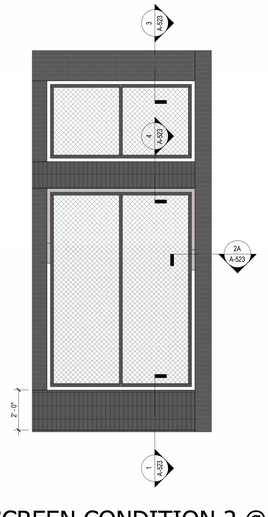
5 A-523 EXHAUST VENT @ METAL PANEL
Scale: 3" = 1'-0"



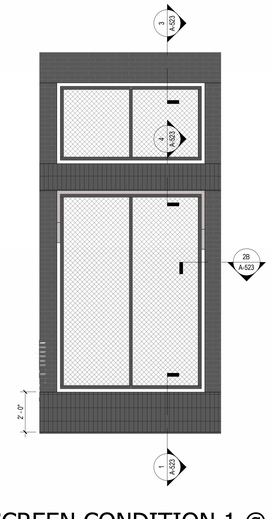
2 A-523 EXHAUST VENT @ BRICK VENEER
Scale: 3" = 1'-0"



1 A-523 GARAGE SCREEN SILL @ BRICK VENEER
Scale: 3" = 1'-0"



GARAGE SCREEN CONDITION 2 @ BRICK



GARAGE SCREEN CONDITION 1 @ BRICK

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TYPICAL GARAGE SCREEN / EXHAUST VENT DETAILS

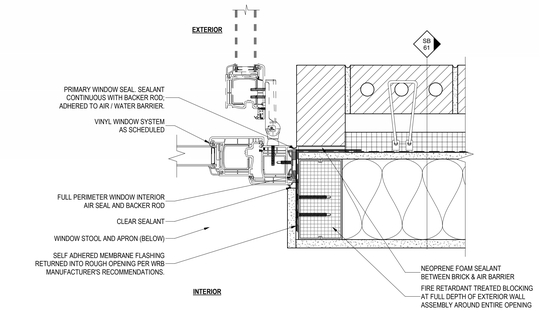
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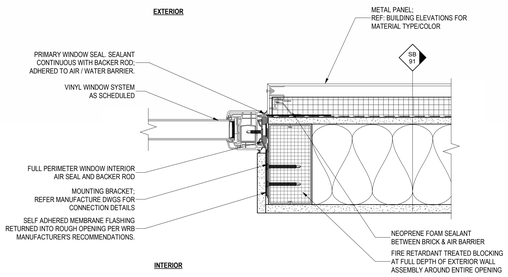
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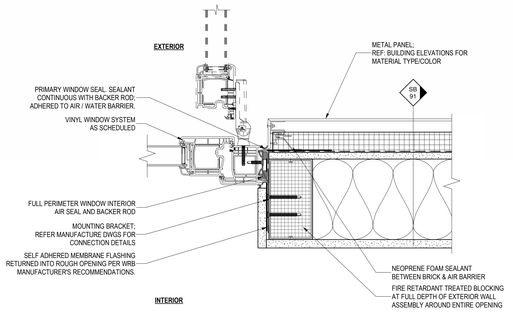
3 A-524 VINYL BALCONY DOOR JAMB @ BRICK VENEER

Scale: 3" = 1'-0"



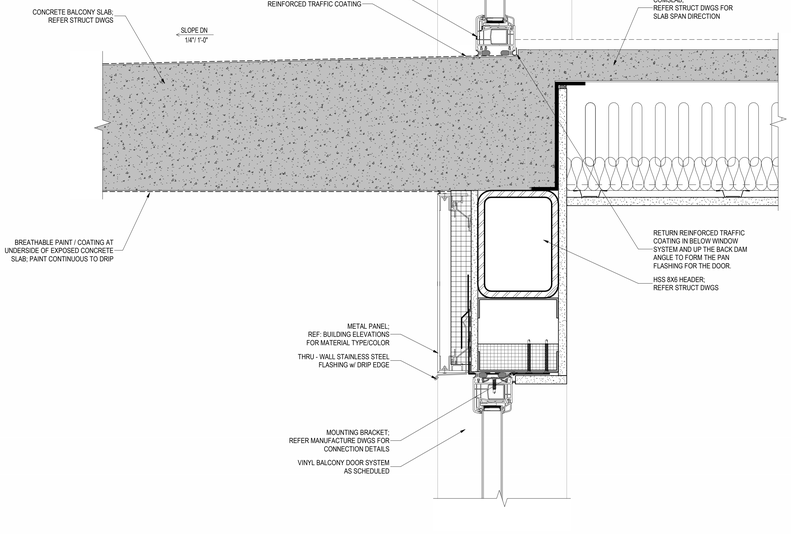
2B A-524 VINYL BALCONY DOOR JAMB 2 @ METAL PANEL

Scale: 3" = 1'-0"



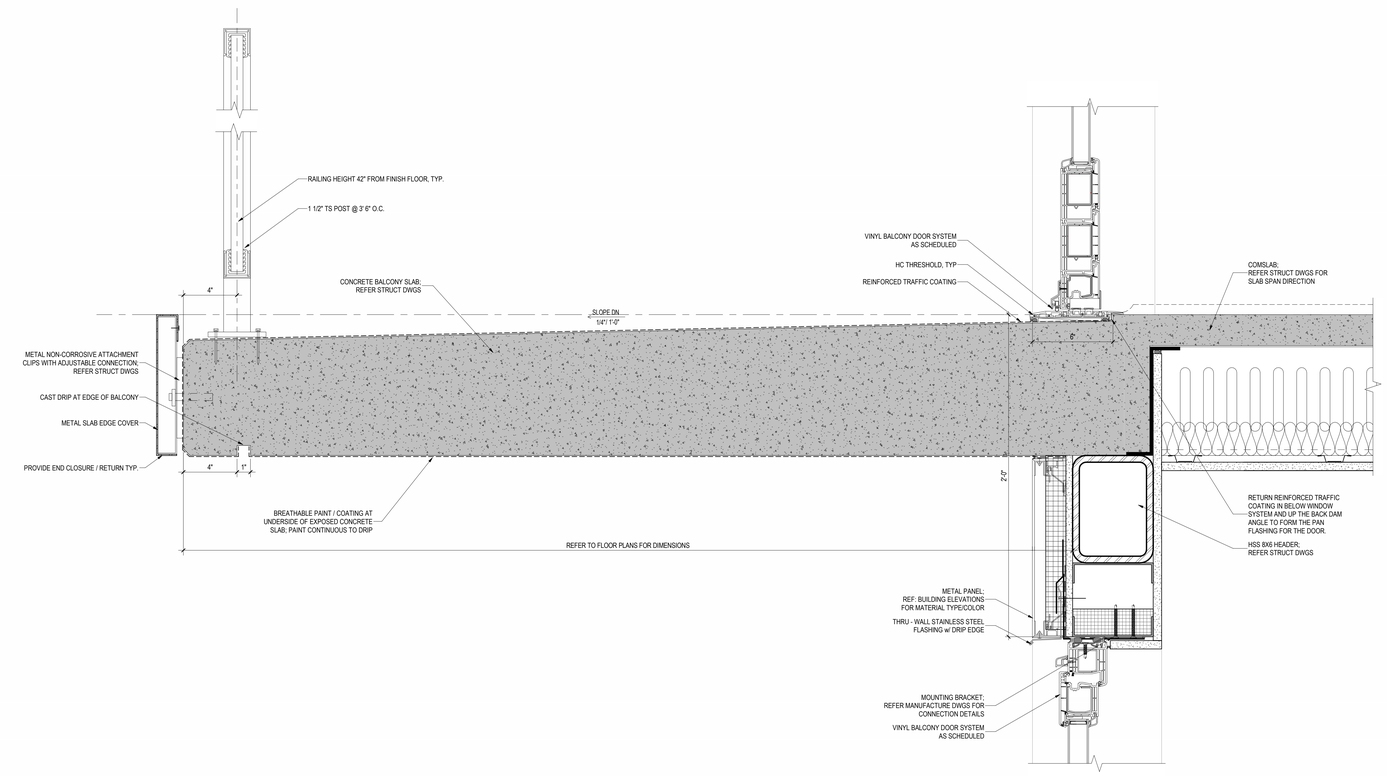
2A A-524 VINYL BALCONY DOOR JAMB 1 @ METAL PANEL

Scale: 3" = 1'-0"



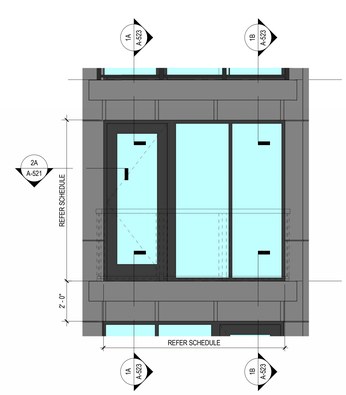
1B A-524 TYPICAL BALCONY SECTION DETAIL (R2 - R8)

Scale: 3" = 1'-0"



1A A-524 TYPICAL BALCONY SECTION DETAIL (R2 - R8)

Scale: 3" = 1'-0"



BALCONY CONDITION @ METAL PANEL

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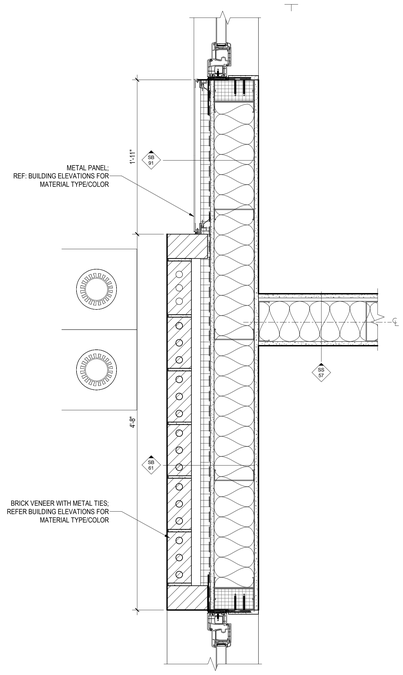
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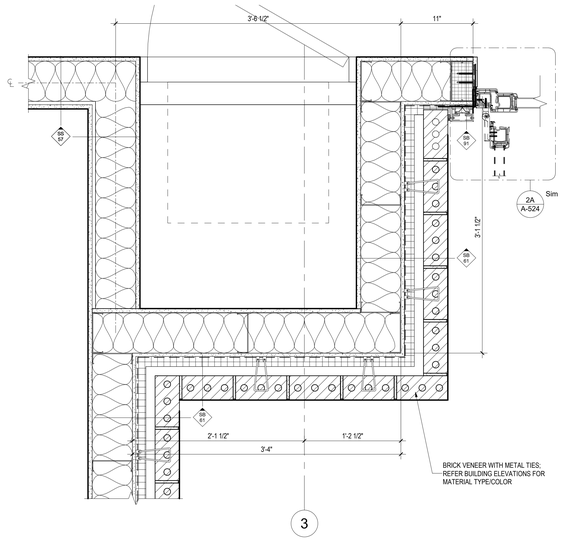
TYPICAL BALCONY DOOR / BALCONY DETAIL

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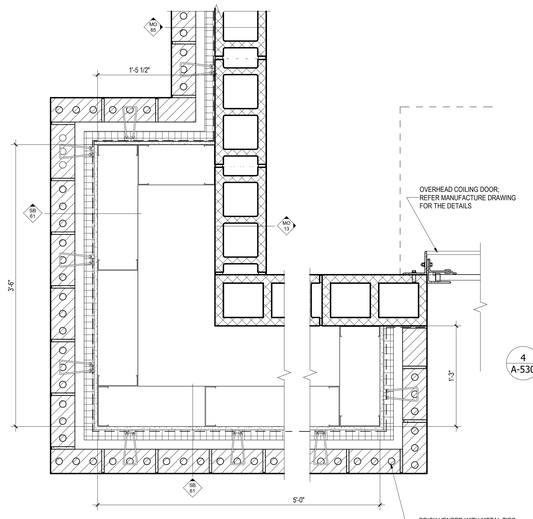
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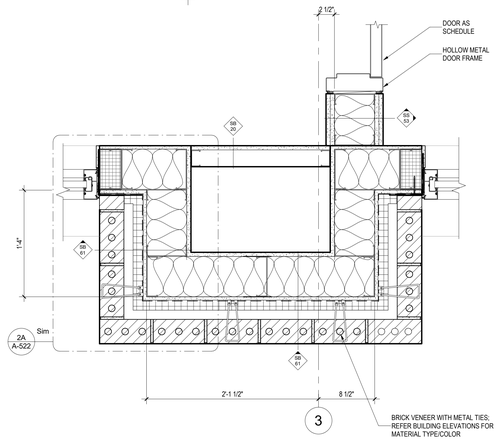


3

10 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

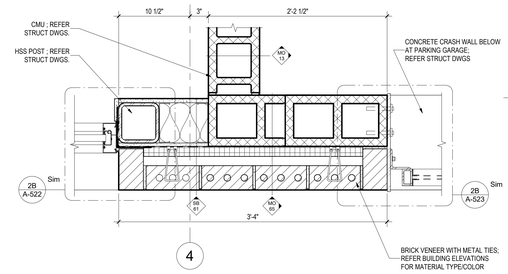


7 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"



3

4 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"



4

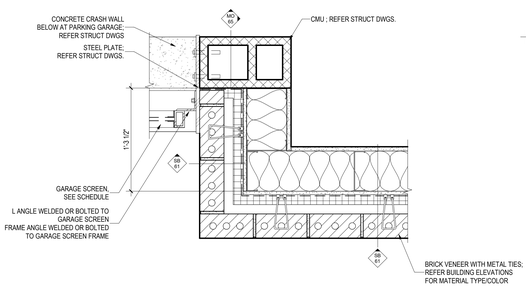
13 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

12 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

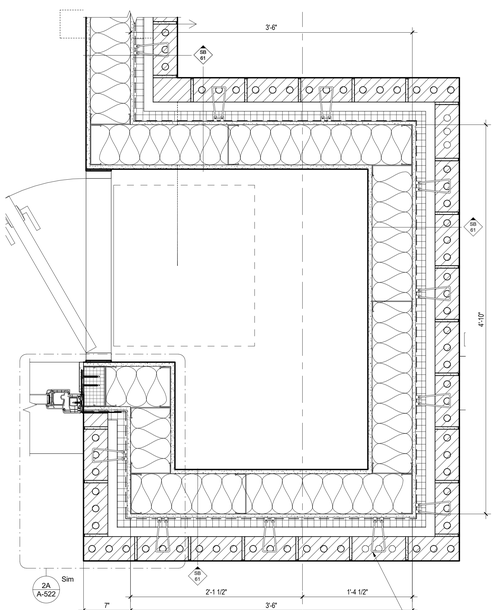
9 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

1

5 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"



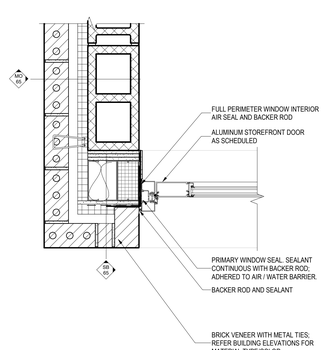
2 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"



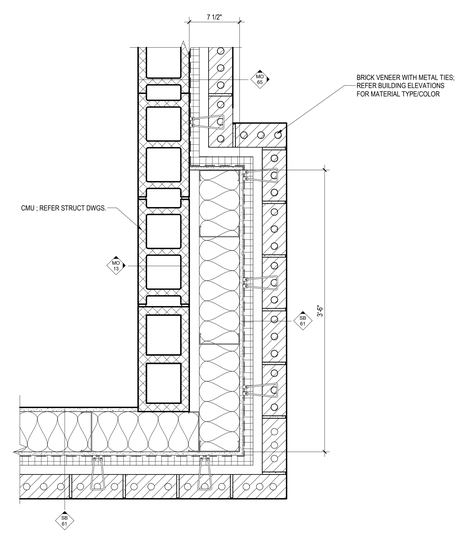
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11 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

8 A-530 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"



6 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"



1 A-530 PLAN DETAIL @ 1ST FLOOR
Scale: 1 1/2" = 1'-0"

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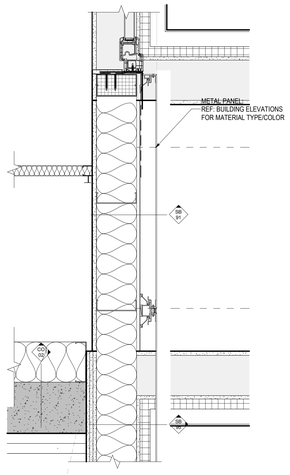
EXTERIOR WALL PLAN DETAILS

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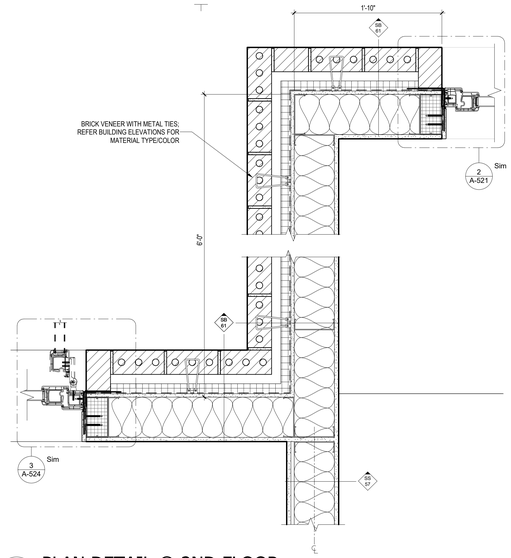
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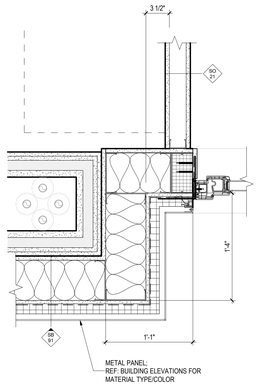
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4 A-531 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

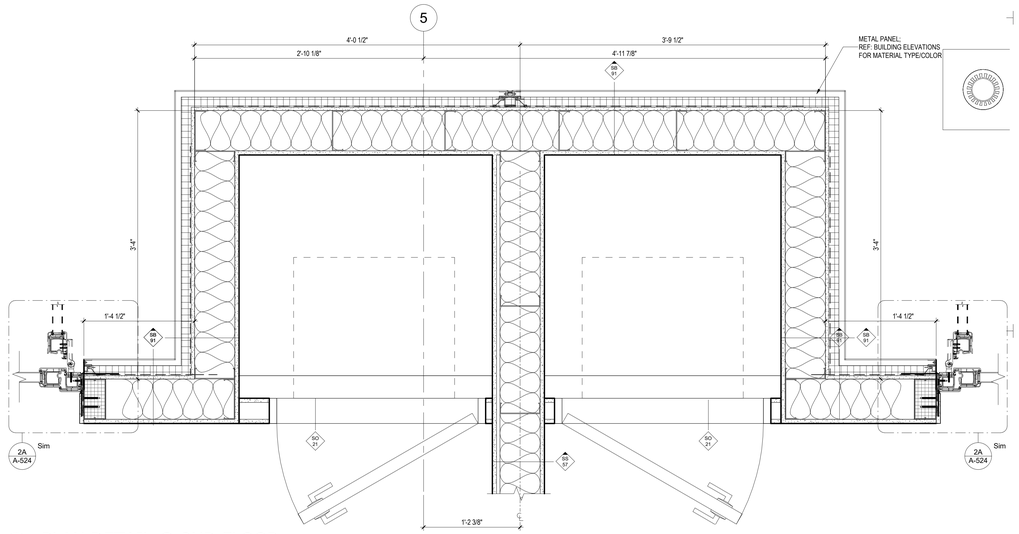


3 A-531 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

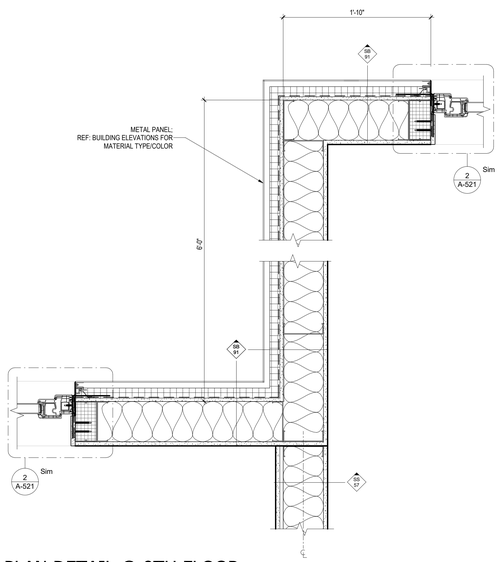


6 A-531 PLAN DETAIL @ 9TH FLOOR
Scale: 1 1/2" = 1'-0"

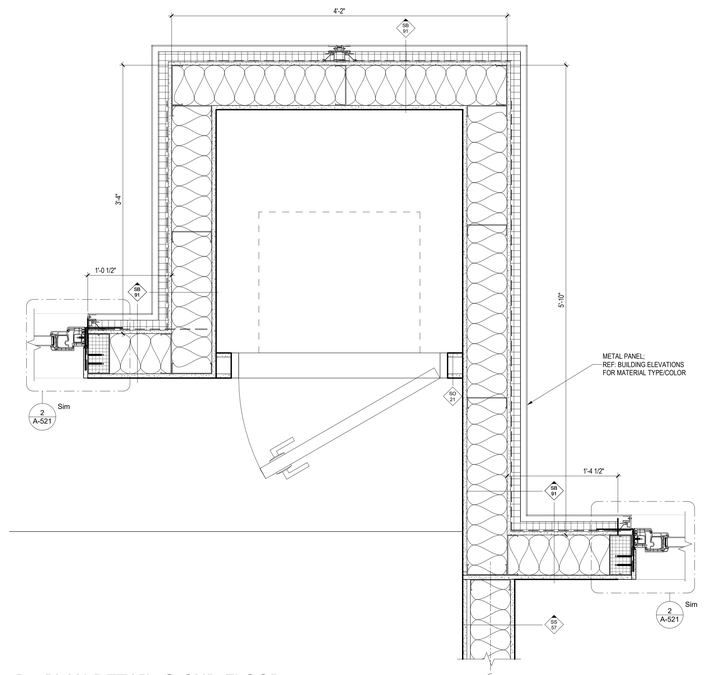
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2 A-531 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"



5 A-531 PLAN DETAIL @ 9TH FLOOR
Scale: 1 1/2" = 1'-0"



1 A-531 PLAN DETAIL @ 2ND FLOOR
Scale: 1 1/2" = 1'-0"

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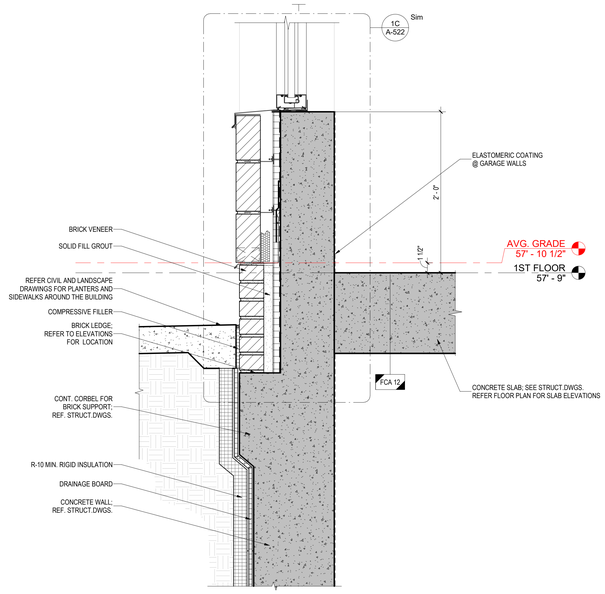
28 Pearl Street
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EXTERIOR WALL PLAN DETAILS

NO.	DESCRIPTION	DATE
PROJECT No:		SKG.0028
DRAWN BY:		Author
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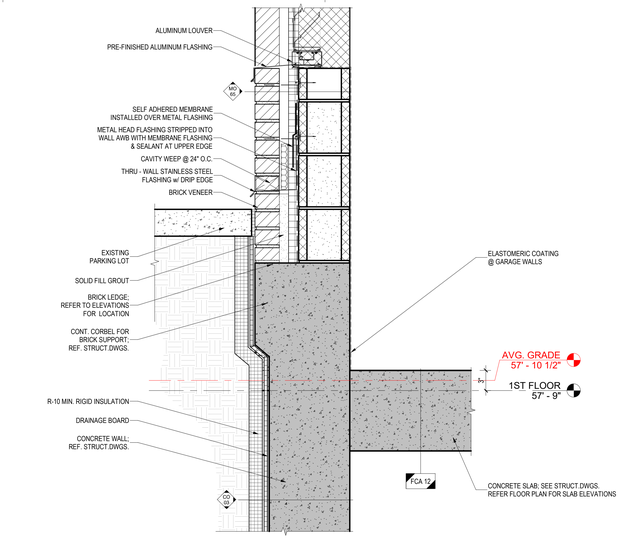
A-531

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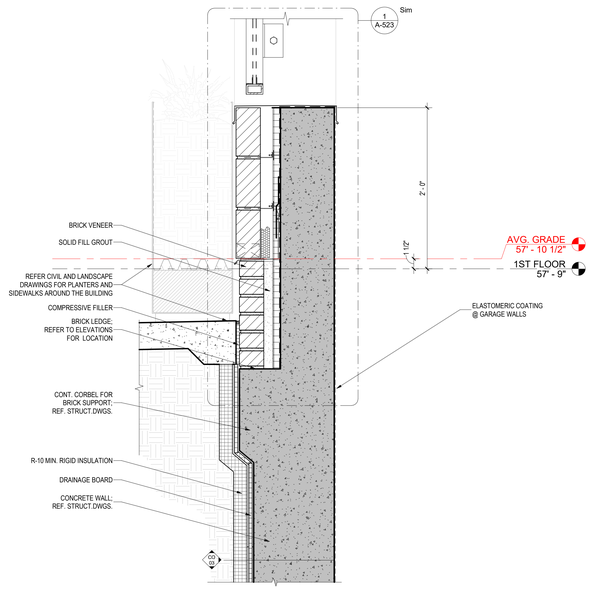
6 A-540 SECTION DETAIL @ 1ST / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



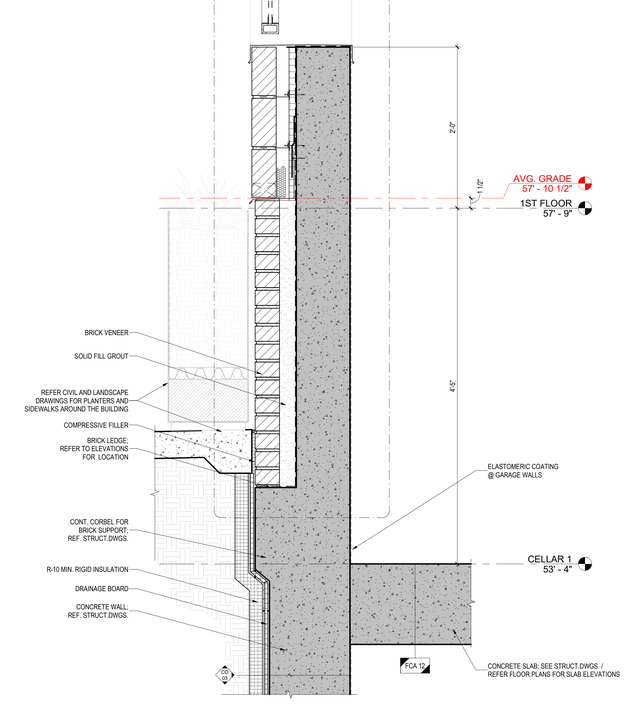
3 A-540 SECTION DETAIL @ 1ST / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



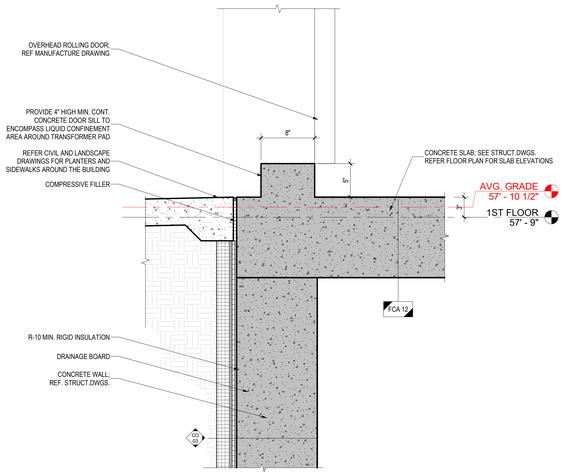
5 A-540 SECTION DETAIL @ 1ST / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



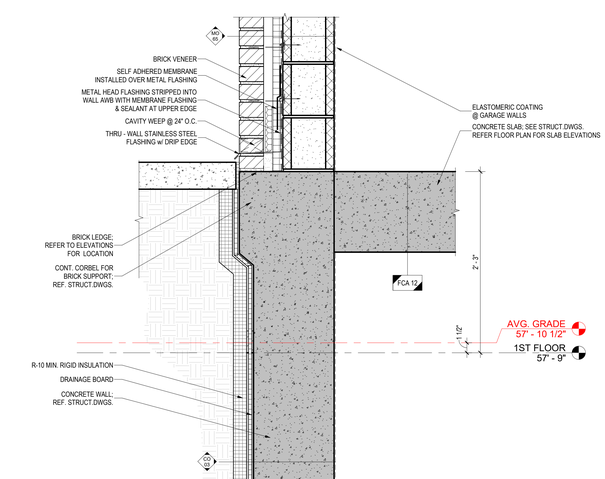
2 A-540 SECTION DETAIL @ 1ST / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



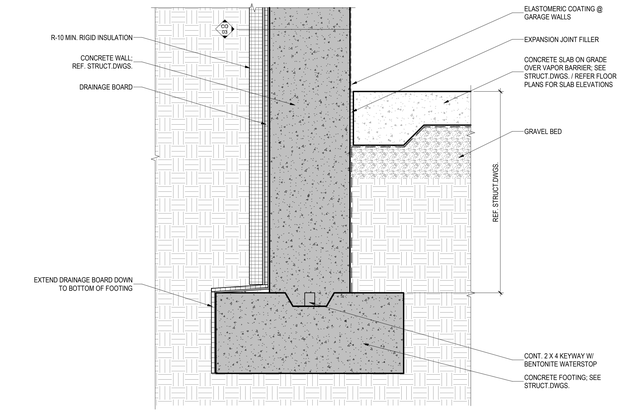
7 A-540 SECTION DETAIL @ 1ST / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



4 A-540 SECTION DETAIL @ GROUND / AVG. GRADE LEVEL

Scale: 1 1/2" = 1'-0"



1 A-540 TYPICAL FOUNDATION DETAIL

Scale: 1 1/2" = 1'-0"

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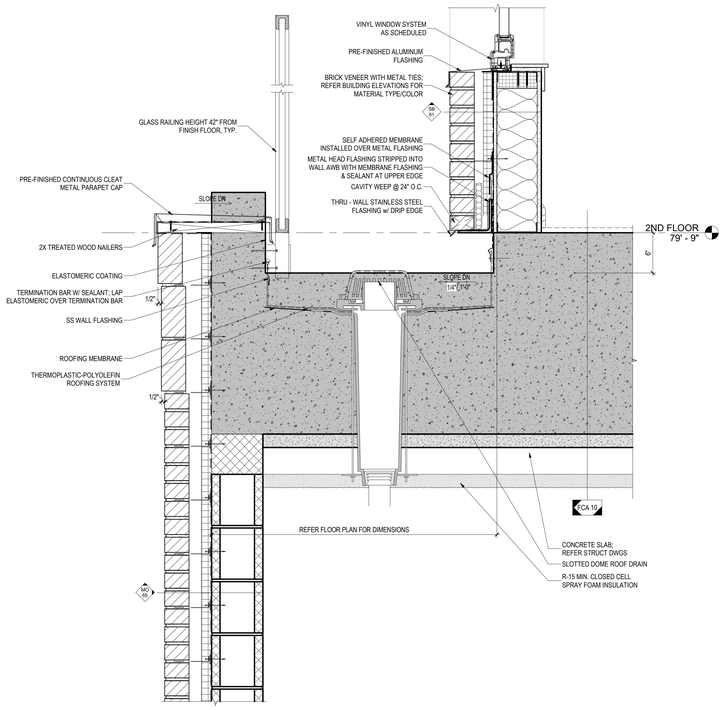
28 Pearl Street
PORT CHESTER, NY

EXTERIOR WALL SECTION DETAILS - FOUNDATION / 1ST - AVG. GRADE LEVEL

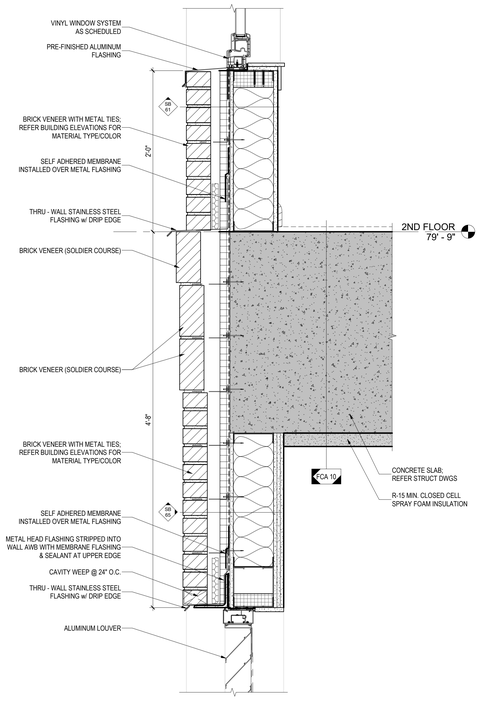
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FILE NAME:		

A-540

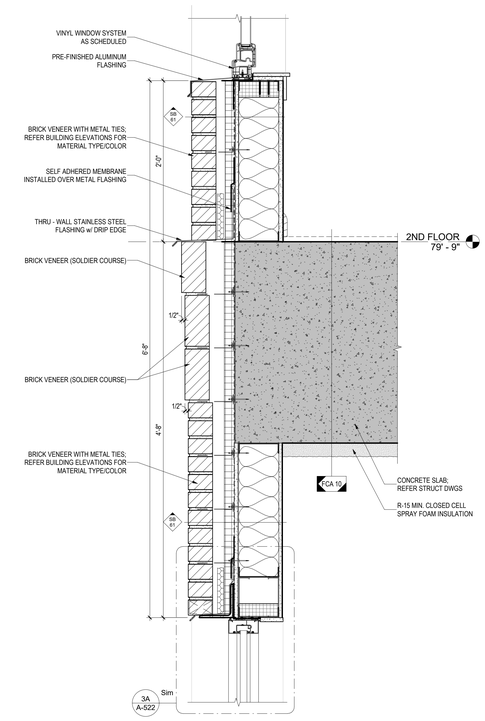
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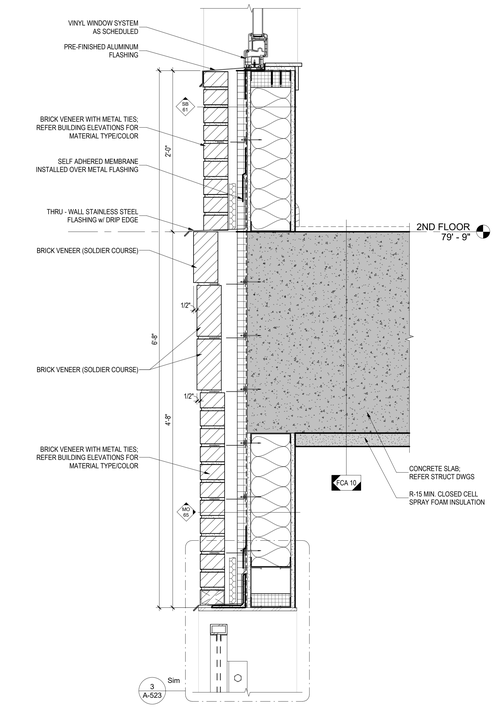
6 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"



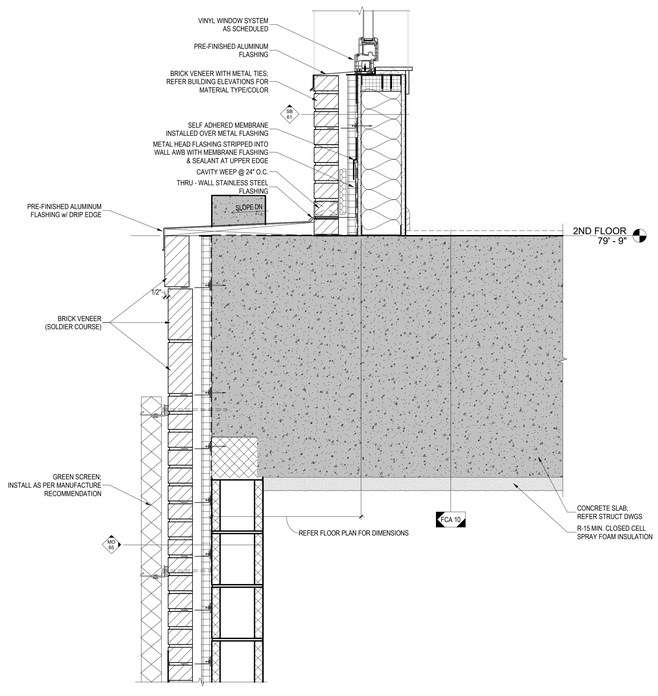
5 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"



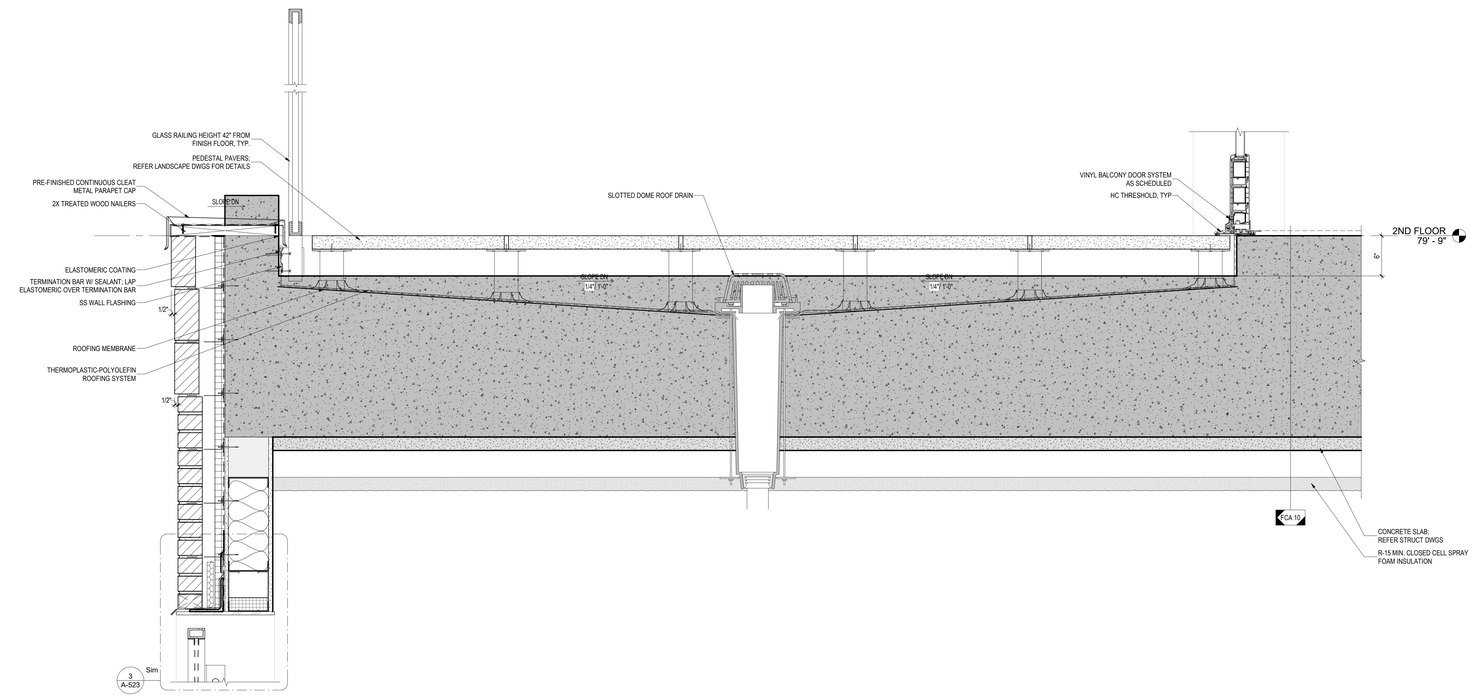
3 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"



2 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"



4 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"



1 A-541 BELOW PODIUM SECTION DETAIL
Scale: 1 1/2" = 1'-0"

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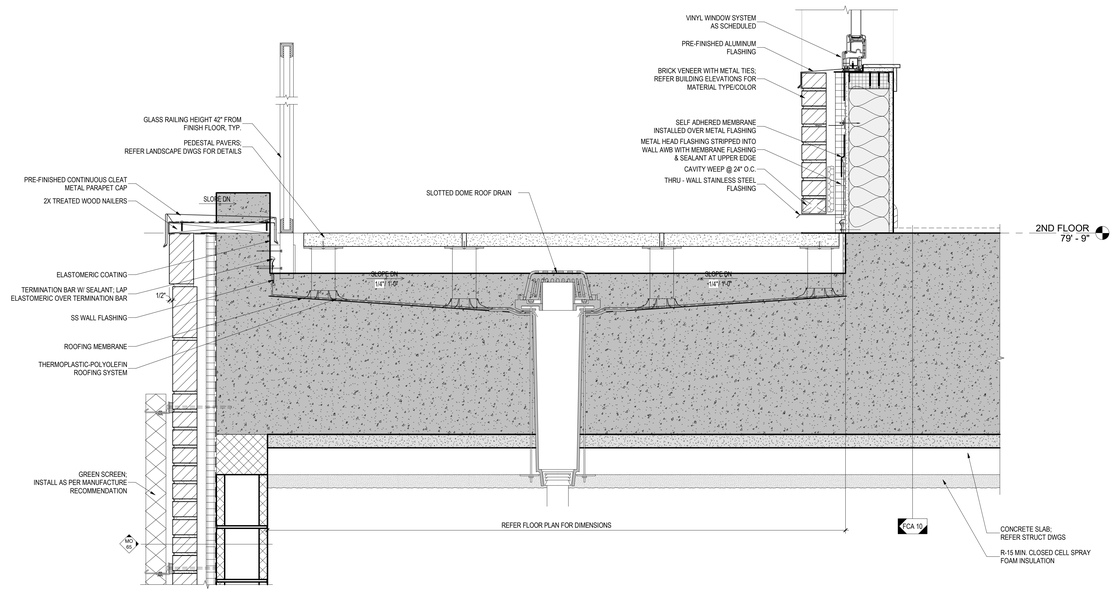
EXTERIOR WALL SECTION DETAILS - BELOW PODIUM LEVEL

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PROJECT No:		SKG.0028
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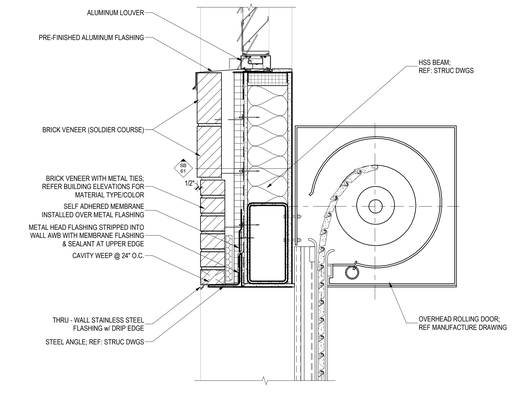
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5 A-542 BELOW PODIUM SECTION DETAIL

Scale: 1 1/2" = 1'-0"



3 A-542 BELOW PODIUM SECTION DETAIL

Scale: 1 1/2" = 1'-0"

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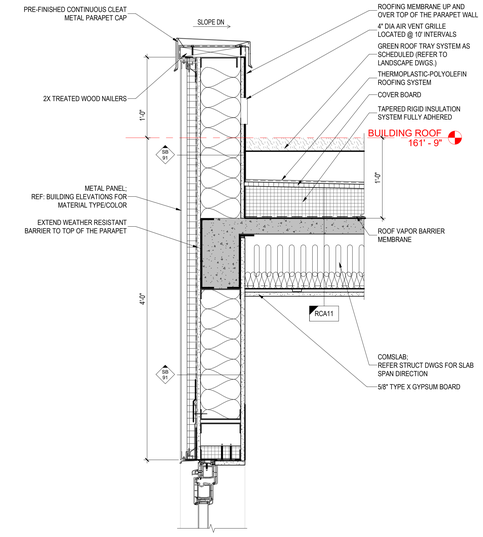
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NO.	DESCRIPTION	DATE
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DRAWN BY:		Author
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PLOT DATE:		2/7/2025 10:16:06 AM
FILE NAME:		

A-542

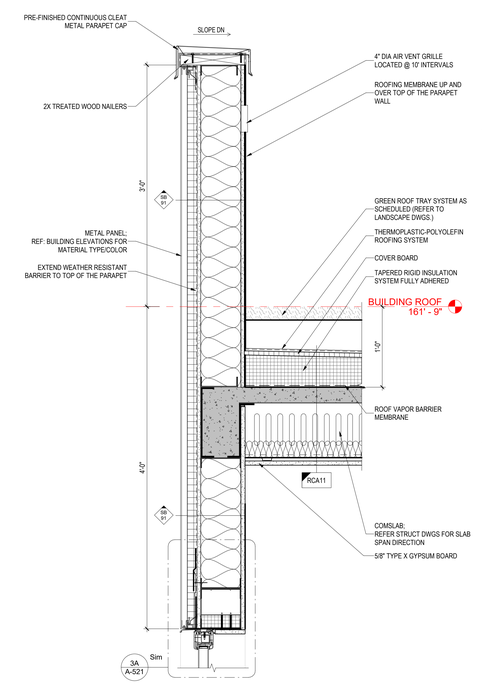
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2 A-543 **TYPICAL ROOF DETAIL**

Scale: 1 1/2" = 1'-0"



1 A-543 **TYPICAL ROOF DETAIL**

Scale: 1 1/2" = 1'-0"

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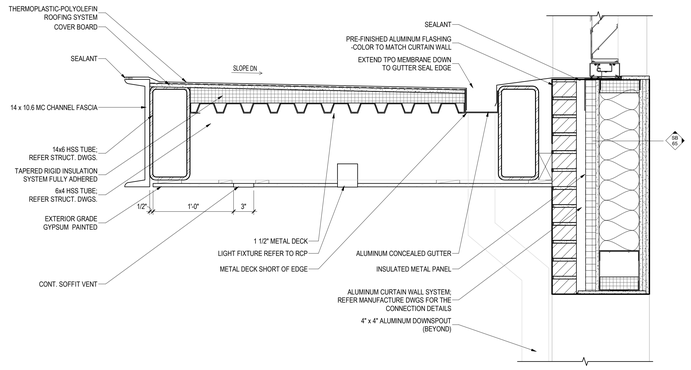
EXTERIOR WALL SECTION DETAILS - ROOF / PARAPET

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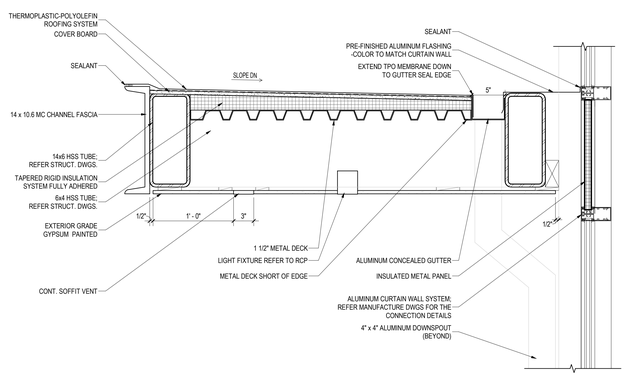
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2 CANOPY DETAIL

Scale: 1 1/2" = 1'-0"



1 CANOPY DETAIL

Scale: 1 1/2" = 1'-0"

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CANOPY DETAILS

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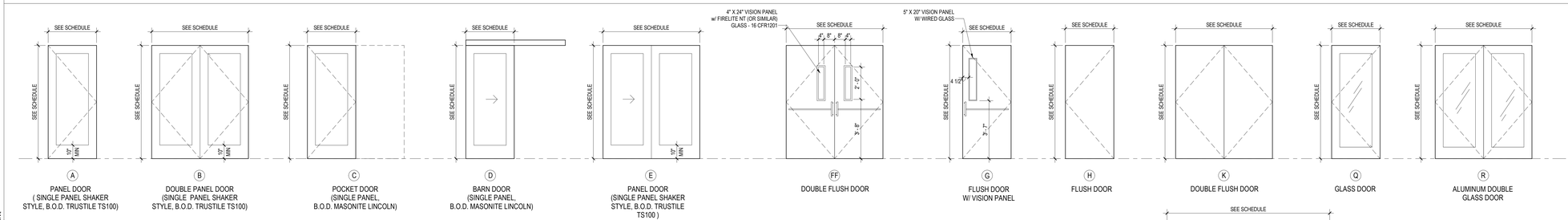
UNIT DOOR SCHEDULE

DOOR NUMBER	LOCATION	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR TYPE	DOOR MATERIAL	DOOR FRAME MATERIAL	FIRE RATING	HARDWARE SET NUMBER	REMARKS
U01	UNIT ENTRY	3' - 0"	7' - 0"	0' - 1 3/8"	A	MTL	MTL	45 MIN		
U02	BEDROOM	3' - 0"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U02.1	BEDROOM	4' - 0"	7' - 0"	0' - 1 3/8"	D	WD	WD	-		
U03	BATH	3' - 0"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U03.1	BATH	3' - 0"	7' - 0"	0' - 1 3/8"	C	WD	WD	-		
U04	CLOSET	2' - 0"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U04.1	CLOSET	2' - 6"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U04.2	CLOSET	2' - 8"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U04.3	CLOSET	2' - 10"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U04.4	CLOSET	5' - 6"	7' - 0"	0' - 1 3/8"	B	WD	WD	-		
U04.5	CLOSET	6' - 0"	7' - 0"	0' - 1 3/8"	B	WD	WD	-		
U04.6	CLOSET	3' - 0"	7' - 0"	0' - 1 3/8"	C	WD	WD	-		
U04.7	CLOSET	4' - 0"	7' - 0"	0' - 1 3/8"	E	WD	WD	-		
U04.8	CLOSET	5' - 0"	7' - 0"	0' - 1 3/8"	E	HCW	WD	-		
U05	W.I.C.	3' - 0"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U06	WASHER/DRYER	2' - 6"	7' - 0"	0' - 1 3/8"	A	WD	WD	-		
U07	MECHANICAL CLOSET	2' - 2"	5' - 0"	0' - 1 3/8"	A	WD	WD	-		
U07.1	MECHANICAL CLOSET	2' - 6"	5' - 0"	0' - 1 3/8"	A	WD	WD	-		
U10	BALCONY DOOR	3' - 0"	7' - 10"	0' - 1 3/4"	Q	ALUM/GLASS	ALUM	-		

COMMON AREA DOOR SCHEDULE

DOOR NUMBER	LOCATION	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR TYPE	DOOR MATERIAL	DOOR FRAME MATERIAL	FIRE RATING	HARDWARE SET NUMBER	REMARKS
CELLAR 2										
C2-01	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	180 MIN		
C2-03	ELEV. LOBBY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		
C2-05A	ELEC. ROOM	6' - 0"	7' - 0"	0' - 1 3/4"	K	MTL	HM	90 MIN		PANIC HARDWARE
C2-05B	ELEC. ROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
C2-06	STORAGE	6' - 0"	7' - 0"	0' - 1 3/4"	K	MTL	HM	90 MIN		
CELLAR 1										
C1-02	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	180 MIN		
C1-02A	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	180 MIN		
C1-05	STORAGE	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	180 MIN		
C1-06A	WATER ROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
C1-06B	WATER ROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
1ST FLOOR										
100	GARAGE	19' - 0"	10' - 0"	0' - 3"	S	-	-	-		
101A	STAIR 1	3' - 0"	7' - 11"	0' - 1 3/8"	Q	ALUM/GLASS	ALUM	90 MIN		
101B	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	180 MIN		
102	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	180 MIN		
103	ELEVATOR LOBBY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		
104	TRASH ROOM	5' - 0"	7' - 0"	0' - 1 3/4"	K	MTL	HM	90 MIN		SELF-CLOSING TIED TO SMOKE ALARM SYSTEM
105A	TRANSFORMER	9' - 0"	10' - 0"	0' - 3"	S	-	-	180 MIN		
105B	TRANSFORMER	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
106A	VESTIBULE / LOBBY	5' - 10"	7' - 11"	0' - 2"	R	ALUM/GLASS	ALUM	-		
106B	VESTIBULE / LOBBY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
107	LOBBY/MAIL ROOM	5' - 10"	7' - 11"		R	ALUM/GLASS	ALUM	-		
107A	LEASING	3' - 0"	7' - 11 1/2"							
107B	PACKAGE ROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
108	FCC	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
109	MDF	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
MEZZANINE										
110	STORAGE	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
111	ELEV. LOBBY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
2ND FLOOR										
201	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
202	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
203A	ELEVATOR LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
203B	ELEVATOR LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
204	TRASH	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		SELF-CLOSING TIED TO SMOKE ALARM SYSTEM
205	JANITOR CLOSET	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
206	UTILITY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
230	AMENITY	6' - 0"	7' - 0"	0' - 1 3/4"	R	ALUM/GLASS	ALUM	-		
231	RESTROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
TYPICAL (3RD - 7TH)										
X01	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
X02	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
X03A	ELEVATOR LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
X03B	ELEVATOR LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
X04	TRASH	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		SELF-CLOSING TIED TO SMOKE ALARM SYSTEM
X05	JANITOR CLOSET	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
X06	UTILITY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
8TH FLOOR										
802	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
803A	ELEV. LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
803B	ELEV. LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
804	TRASH	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		SELF-CLOSING TIED TO SMOKE ALARM SYSTEM
805	JANITOR CLOSET	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
806	UTILITY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
9TH FLOOR										
901	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
902	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
903A	ELEV. LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
903B	ELEV. LOBBY	6' - 0"	7' - 0"	0' - 1 3/4"	FF	MTL	HM	45 MINS		PANIC HARDWARE / HOLD OPEN
904	TRASH	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	45 MIN		SELF-CLOSING TIED TO SMOKE ALARM SYSTEM
905	JANITOR CLOSET	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
906	UTILITY	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM	90 MIN		
930A	AMENITY/CLUBHOUSE	6' - 0"	7' - 0"	0' - 1 3/4"	R	ALUM/GLASS	ALUM	-		
930B	AMENITY/CLUBHOUSE	6' - 0"	7' - 0"	0' - 1 3/4"	R	ALUM/GLASS	ALUM	-		
931	RESTROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
932	RESTROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
BUILDING ROOF										
R01	STAIR 1	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
R02	STAIR 2	3' - 0"	7' - 0"	0' - 1 3/4"	G	MTL	HM	90 MIN		
R03A	ELEV. LOBBY	3' - 0"	7' - 10"	0' - 1 3/8"	Q	ALUM/GLASS	ALUM	90 MIN		
R03B	ELEV. LOBBY	3' - 0"	7' - 10"	0' - 1 3/8"	Q	ALUM/GLASS	ALUM	90 MIN		
R06	RESTROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			
R07	RESTROOM	3' - 0"	7' - 0"	0' - 1 3/4"	H	MTL	HM			

DOOR TYPE



A PANEL DOOR (SINGLE PANEL SHAKER STYLE, B.O.D. TRUSTILE TS100)

B DOUBLE PANEL DOOR (SINGLE PANEL SHAKER STYLE, B.O.D. TRUSTILE TS100)

C POCKET DOOR (SINGLE PANEL, B.O.D. MASONITE LINCOLN)

D BARN DOOR (SINGLE PANEL, B.O.D. MASONITE LINCOLN)

E PANEL DOOR (SINGLE PANEL SHAKER STYLE, B.O.D. TRUSTILE TS100)

FF DOUBLE FLUSH DOOR

G FLUSH DOOR W/ VISION PANEL

H FLUSH DOOR

K DOUBLE FLUSH DOOR

Q GLASS DOOR

R ALUMINUM DOUBLE GLASS DOOR

S ROLLING STEEL DOOR

DOOR SCHEDULE GENERAL NOTES

1. DIMENSIONS INDICATED ON PLANS AND SCHEDULES ARE NOMINAL. COORDINATE PRIOR TO FABRICATION AND CONSTRUCTION.
2. PROVIDE WEATHERPROOFING SEALS AT EXTERIOR DOORS.
3. FIRE RATING OF DOORS AND FRAMES SHALL COMPLY WITH APPLICABLE CODE REGULATIONS. DOOR FRAMES AND HARDWARE SHALL HAVE SAME FIRE RATING AS DOOR WITHIN THEM.
4. UNIT ENTRY DOOR TO COMPLY WITH APPLICABLE CODE AND EQUIPPED WITH DEAD BOLT LOCK AND DOOR VIEWER.
5. ALL ACCESSIBLE DOORS HARDWARE IS REQUIRED WITH NO PINCHING, TWISTING, OR GRASPING TO OPERATE AND REQUIRE NO MORE THAN 5 POUNDS OF FORCE TO OPERATE PER 2009 ANSI 117.1 404.2.6.
6. COORDINATE DOOR FRAME SIZE WITH DOOR SIZE AND WITH WALL/PARTITION THICKNESS SHOW IN DOOR SCHEDULE.
7. PROVIDE A MINIMUM OF 3 ANCHORS PER DOOR. PROVIDE 4 ANCHORS PER JAMB FOR DOOR OVER 7'-0" HIGH.
8. APPLY SEALANT AROUND THE ENTIRE FRAME PERIMETER OF ALL EXTERIOR DOOR AND INTERIOR DOOR FRAMES. SEALANT APPLICATION AT INTERIOR DOOR FRAMES SHOULD CLOSE THE GAP BETWEEN THE WALL SURFACE AND THE FRAME SHOULD NOT CREATE A COVE AT THIS JUNCTURE.
9. ALL CORRIDOR DOOR ASSEMBLIES ARE REQUIRED TO PROVIDE SMOKE AND DRAFT CONTROL PER SECTION 716.2.2.1.1 IN THE BCNYS.
10. ALL CORRIDOR DOORS TO BE UL 1784 CERTIFIED AND WITH A "S" SHOWN ON THE FIRE-RATING LABEL.
11. REFER TO SPECS FOR HARDWARE SCHEDULE, HARDWARE TO BE PROVIDED BY INSTALLER.
12. DOOR ROUGH OPENING DIMENSIONS TO BE VERIFIED WITH MANUFACTURER.
13. NON-ACCESSIBLE BUILDING ENTRANCES MUST HAVE DIRECTIONAL SIGNAGE DIRECTING PEOPLE TO THE CLOSEST ACCESSIBLE ENTRANCE. DIRECTIONAL SIGNAGE MUST HAVE INTERNATIONAL SYMBOL OF ACCESSIBILITY.
14. ALL EXTERIOR HOLLOW METAL FRAMES ARE WELDED.
15. KNOCK-DOWN FRAMES ARE ACCEPTABLE FOR INTERIOR OPENINGS IN ASSEMBLIES OF 1-HR RATING OR LESS. WELDED FRAMES ARE REQUIRED FOR OPENINGS IN ALL OTHER ASSEMBLIES.
16. 4" HEAD AT MASONRY OPENINGS.

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DOOR SCHEDULE

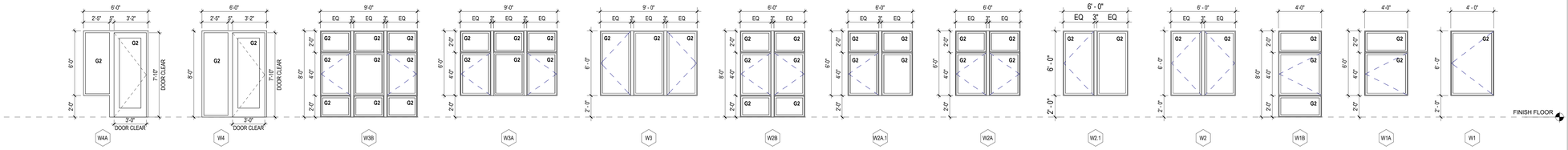
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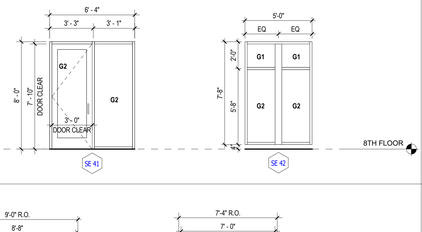
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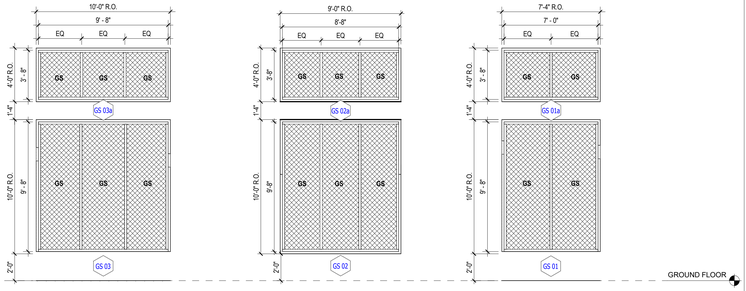
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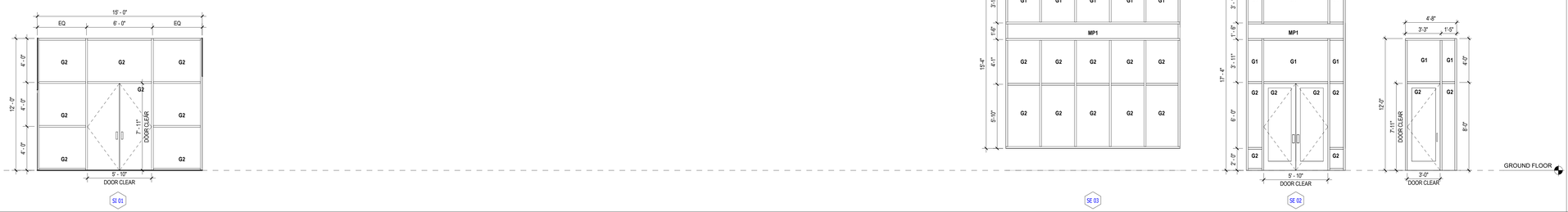
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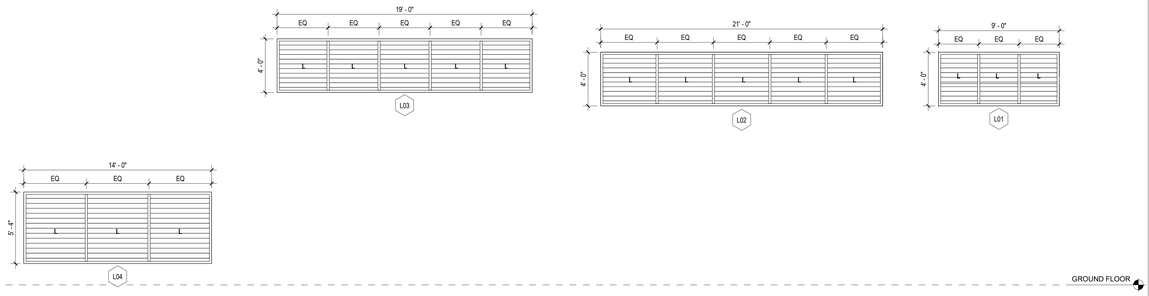
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GENERAL NOTES

FOR WINDOWS, EXTERIOR GLASS DOORS, AND STOREFRONTS :

1. VERIFY FINAL DIMENSIONS IN FIELD.
2. GC TO COORDINATE FINAL DOOR, WINDOW AND STOREFRONT ROUGH OPENINGS AS PER FINAL PRODUCT SELECTION REQUIREMENTS.
3. OUTSIDE DIMENSIONS ARE FOR ROUGH OPENINGS.FIELD VERIFY ROUGH OPENING DIMENSIONS
4. HORIZONTAL MULLS AND MUNTONS (IF ANY) SHALL ALIGN @ CENTER. ADJUST LOCATION OF MULLS & MUNTONS WITHIN WINDOW ASSEMBLIES AS REQUIRED TO ALIGN.
5. THE FOLLOWING SHALL BE CONSIDERED SPECIFIC HAZARDOUS LOCATIONS REQUIRING SAFETY GLAZING MATERIALS:
   - A. GLAZING IN SWINGING DOORS;
   - B. GLAZING IN SLIDING DOORS;
   - C. GLAZING IN DOORS AND ENCLOSURES FOR BATHTUBS AND SHOWERS AND ANY PORTION OF THE BUILDING WALL ENCLOSING THESE COMPARTMENTS WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS TAHN 60" ABOVE AN STANDING SURFACE;
   - D. GLAZING IN AN INDIVIDUAL FIXED OR OPERABLE PANEL ADJACENT TO A DOOR WHERE THE NEAREST EXPOSED EDGE OF THE GLAZING IS WITHIN A 24-INCH ARC OF EITHER VERTICAL EDGE OF THE DOOR IN A CLOSED POSITION AND WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 60 INCHES ABOVE THE WALKING SURFACE.
   - E. GLAZING IN AN INDIVIDUAL FIXED OR OPERABLE PANEL, WHICH MEETS ALL OF THE FOLLOWING CONDITIONS:
     - EXPOSED AREA OF AN INDIVIDUAL PANEL GREATER THAN 9 SQUARE FEET;
     - EXPOSED BOTTOM EDGE LESS THAN 18 INCHES ABOVE THE FLOOR;
     - EXPOSED TOP EDGE GREATER THAN 36 INCHES ABOVE THE FLOOR AND
     - ONE OR MORE WALKING SURFACE(S) WITHIN 36 INCHES HORIZONTALLY OF THE PLANE OF THE GLAZING.
6. 1" THICK INSULATING GLASS UNITS SHALL BE USED FOR ALL RESIDENTIAL GLAZING.
7. ALL STOREFRONTS TO BE 1" INSULATED GLASS WITH TWO PANES OF 1/4" GLASS

- MIN. 1" THICK INSULATED GLASS, SOLARBAN 60, LOW -3 COATING ON #2 SURFACE, ARGON FILLED
- GLASS COLOR: CLEAR
- VERTICAL GLAZING SHGC: 0.36 Max.
- VERTICAL GLAZING U-FACTOR (Fixed fenestration): 0.38 Max.
- VERTICAL GLAZING U-FACTOR (Entrance doors): 0.77 Max.
- FENESTRATION VISUAL LIGHT TRANSMITTANCE: 63%
- STC RATING: 35 OR BETTER

8. REFER TO SPECIFICATIONS FOR RESIDENTIAL WINDOW, STOREFRONT AND CURTAIN WALL GLASS SYSTEMS.
9. PROVIDE WINDOW ASSEMBLIES WITH A MINIMUM STC RATING OF 33 OR 35 (OR BETTER) BASED ON BUILDING ORIENTATION, REFER TO PLANS.
10. ALL LOCKS ON OPERABLE WINDOWS TO BE MOUNTED NO MORE THAN 48" AFF IN ROOMS REQUIRED TO BE ACCESSIBLE. REQUIRE NO PINCHING, TWISTING, OR GRASPING TO OPERATE AND REQUIRE NO MORE THAN 5 POUNDS OF FORCE TO OPERATE.
11. PERFORMANCE REQUIREMENTS: AIR LEAKAGE = 0.20 CFM / SF MAXIMUM
12. ALL WINDOWS TO HAVE 4" LIMITER
13. ALL WINDOWS AND DOOR ASSEMBLIES SHALL BE THEMALLY BROKEN.
14. OVERALL DIMENSIONS AT STOREFRONTS UNITS SHALL BE VERIFIED AND FIELD AND COORDINATED WITH MANUFACTURER'S RECOMMENDATION FOR TOLERANCES.

GLAZING SCHEDULE

NOTE: ALL GLASS IS TYPE G1 UNLESS OTHERWISE NOTED.

MIN. 1" THICK INSULATED GLASS, SOLARBAN 60, LOW -3 COATING ON #2 SURFACE, ARGON FILLED
GLASS COLOR: CLEAR
VERTICAL GLAZING SHGC: 0.38
VERTICAL GLAZING U-FACTOR: 0.38
FENESTRATION VISUAL LIGHT TRANSMITTANCE: 63%
THERMALLY BROKEN ALUMINUM FRAMES

G1 - ¼" CLEAR GLASS + ½" AS W/ ARGON + ¼" CLEAR GLASS

G2 - ¼" CLEAR TEMPERED GLASS + ½" AS W/ ARGON + ¼" CLEAR TEMPERED GLASS

S1 - ¼" SPANDREL GLASS + ½" AS W/ ARGON + ¼" SPANDREL GLASS

F1 - ¼" FROSTED GLASS + ½" AS W/ ARGON + ¼" FROSTED GLASS

L - METAL LOUVER COLOR TO MATCH STOREFRONT SYSTEM.

MP1 - 1" THICK INSULATED METAL PANEL COLOR TO MATCH CURTAIN WALL SYSTEM.

GS - GRID SCREEN = BOD: ALUMINUM WIRE SQUARE MESH 3"X3" WOVEN-LOCK CRIMP WEAVE.

WINDOW SCHEDULE

TYPE MARK	WIDTH	HEIGHT	COUNT
W1	4' - 0"	6' - 0"	36
W1A	4' - 0"	6' - 0"	8
W1B	4' - 0"	8' - 0"	4
W2	6' - 0"	6' - 0"	121
W2.1	6' - 0"	6' - 0"	6
W2A	6' - 0"	6' - 0"	23
W2A.1	6' - 0"	6' - 0"	2
W2B	6' - 0"	8' - 0"	15
W3	9' - 0"	6' - 0"	50
W3A	9' - 0"	6' - 0"	12
W3B	9' - 0"	8' - 0"	8
W4	3' - 0"	8' - 0"	1
W4A	3' - 0"	8' - 0"	6
W5	3' - 0"	8' - 0"	16
W5A	3' - 0"	8' - 0"	4
Grand total: 312			

WINDOW SCHEDULE
PENTHOUSE STOREFRONT SCHEDULE
GARAGE SCREEN
LOBBY / LEASING / VESTIBULE / COMMERCIAL & INTERIOR AREA STOREFRONT SCHEDULE
GARAGE LOUVERS

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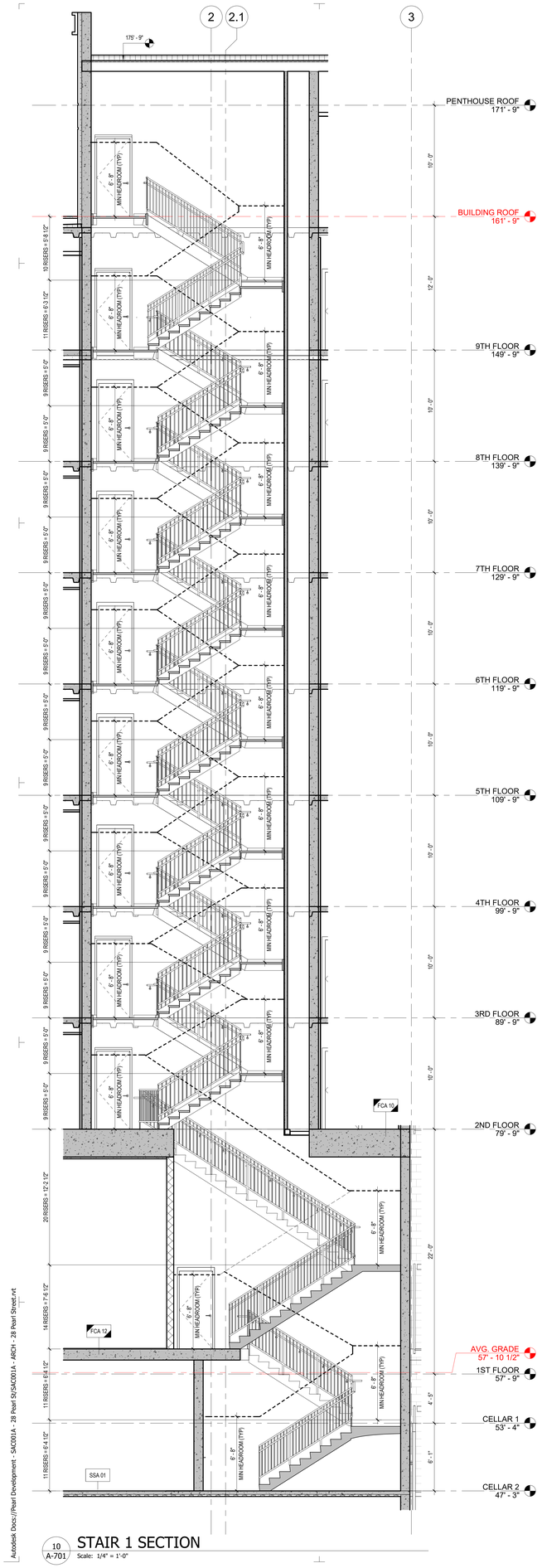
WINDOW AND STOREFRONT SCHEDULE

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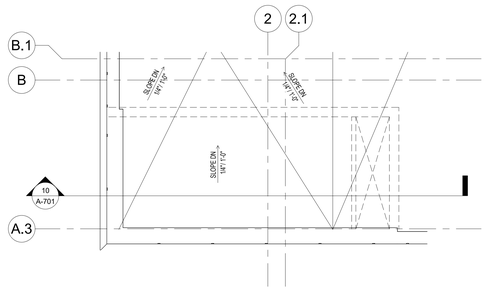
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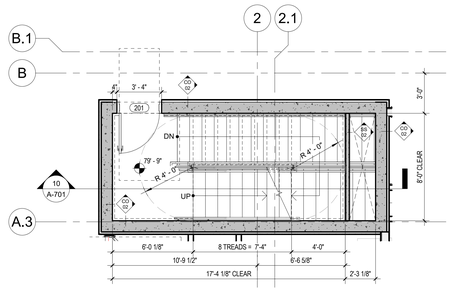
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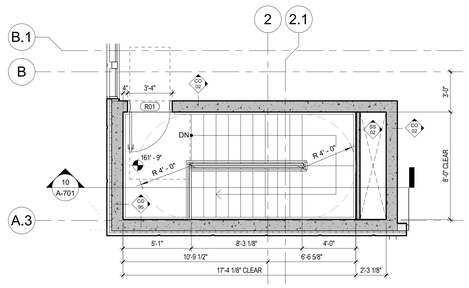
10 A-701 STAIR 1 SECTION
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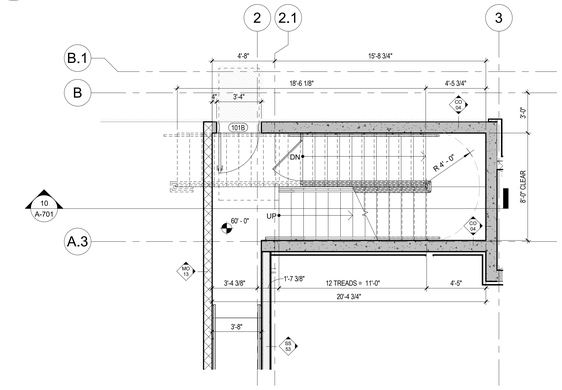
8 A-701 PENTHOUSE ROOF PLAN
Scale: 1/4" = 1'-0"



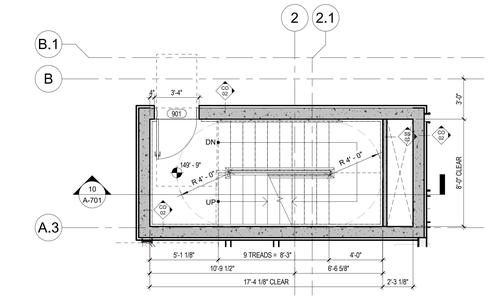
4 A-701 2ND FLOOR PLAN
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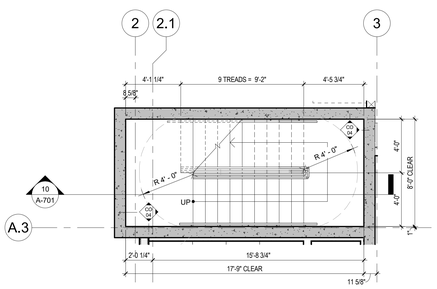
7 A-701 BUILDING ROOF FLOOR PLAN
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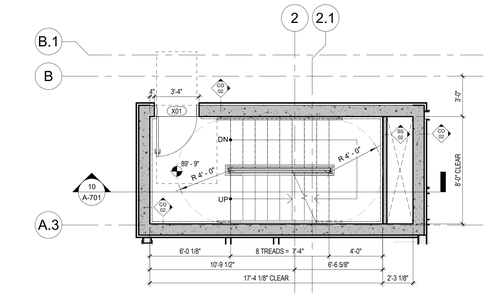
3 A-701 1ST FLOOR PLAN
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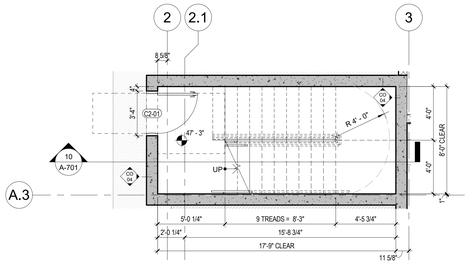
6 A-701 9TH FLOOR PLAN
Scale: 1/4" = 1'-0"



2 A-701 CELLAR 1 FLOOR PLAN
Scale: 1/4" = 1'-0"



5 A-701 TYPICAL (3RD-8TH) FLOOR PLAN
Scale: 1/4" = 1'-0"



1 A-701 CELLAR 2 FLOOR PLAN
Scale: 1/4" = 1'-0"

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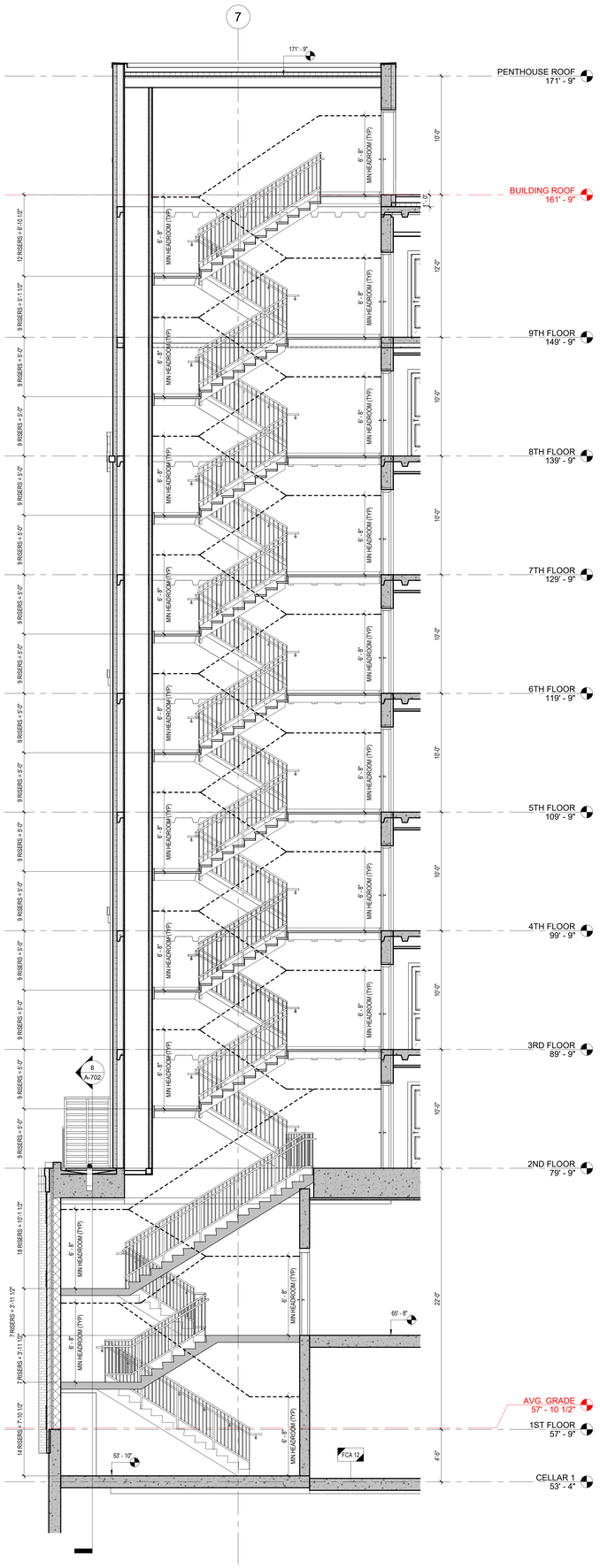
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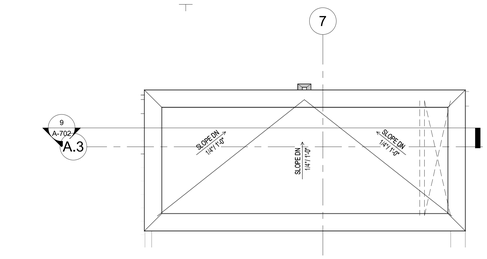
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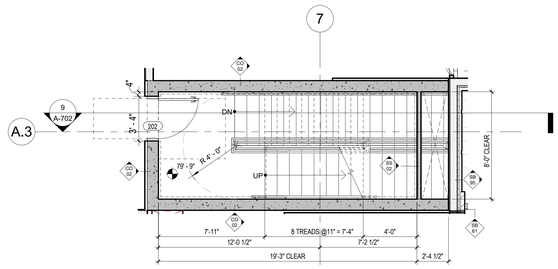
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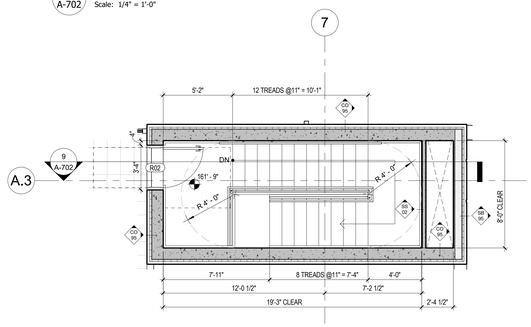
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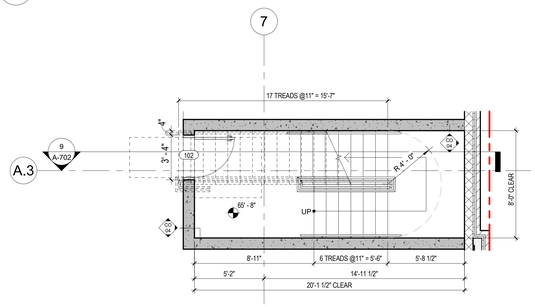
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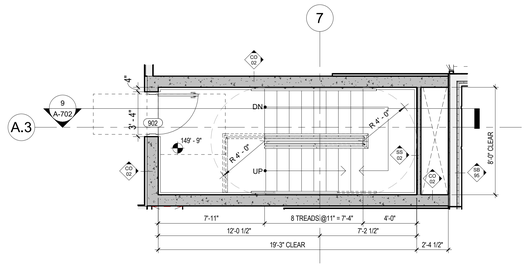
3 A-702 2ND FLOOR PLAN
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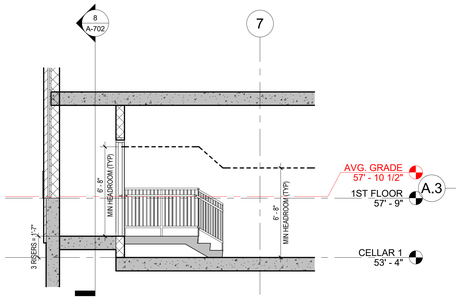
6 A-702 BUILDING ROOF FLOOR PLAN
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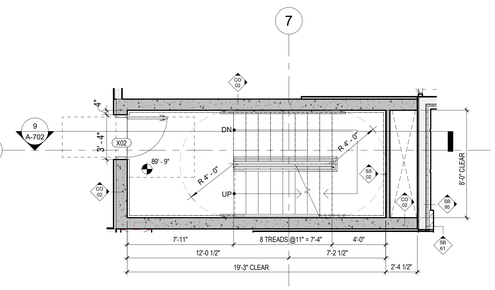
2 A-702 FIRST FLOOR PLAN
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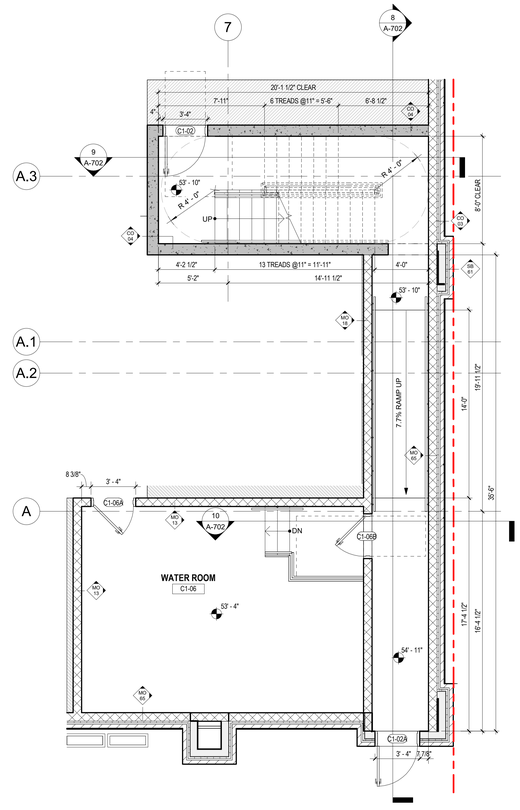
5 A-702 9TH FLOOR PLAN
Scale: 1/4" = 1'-0"



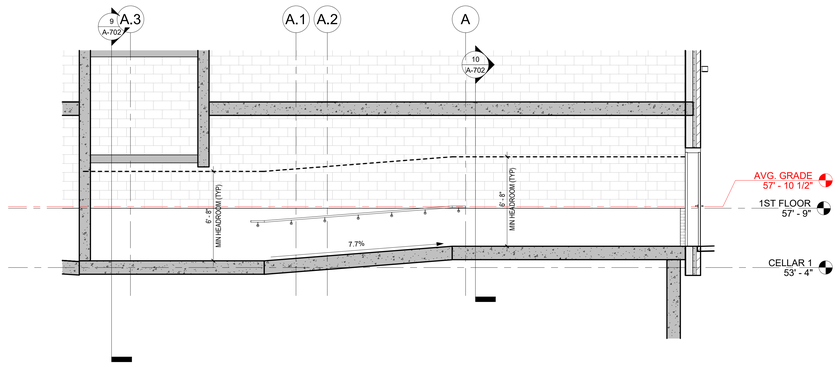
10 A-702 STAIR 2 SECTION 3
Scale: 1/4" = 1'-0"



4 A-702 TYPICAL (3RD-8TH) FLOOR PLAN
Scale: 1/4" = 1'-0"



1 A-702 CELLAR 1 FLOOR PLAN
Scale: 1/4" = 1'-0"



8 A-702 STAIR 2 SECTION 2
Scale: 1/4" = 1'-0"

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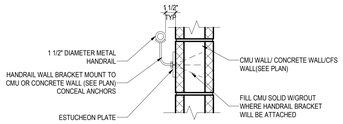
STAIR 2 - PLANS & SECTIONS

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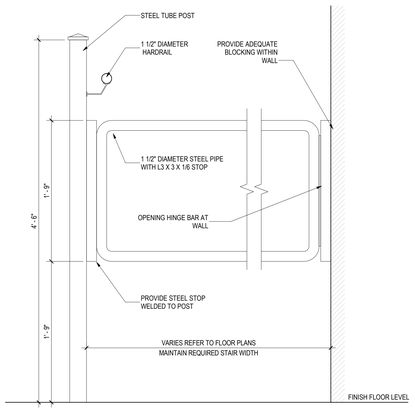
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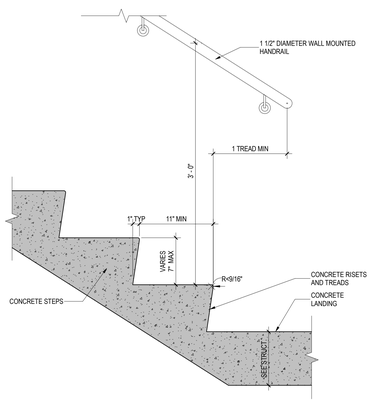
14 A-703 HANDRAIL SECTION AT CMU WALL

Scale: 1 1/2" = 1'-0"



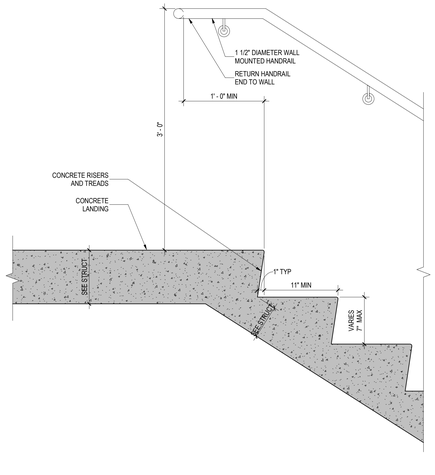
13 A-703 STAIR - SAFETY GATE

Scale: 1 1/2" = 1'-0"



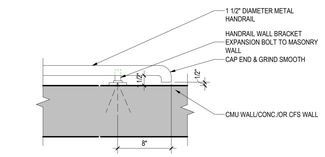
12 A-703 HANDRAIL EXTENSION AT BOTTOM OF LANDING

Scale: 1 1/2" = 1'-0"



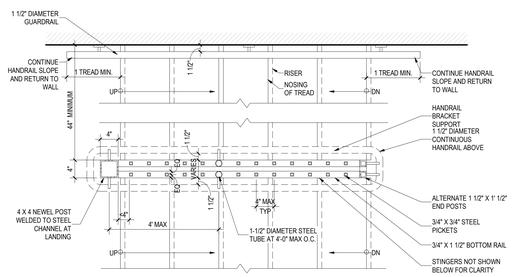
11 A-703 HANDRAIL EXTENSION AT TOP OF LANDING

Scale: 1 1/2" = 1'-0"



15 A-703 HANDRAIL RETURN AT WALL

Scale: 1 1/2" = 1'-0"

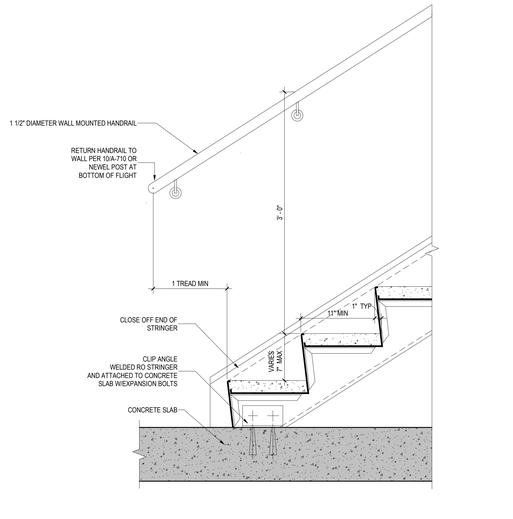


10 A-703 STAIR RAILING PLAN DETAIL

Scale: 1" = 1'-0"

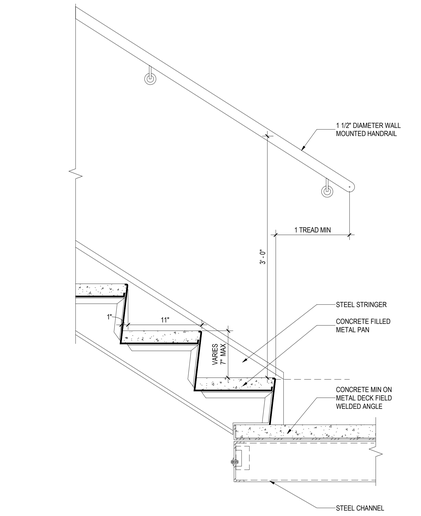
9 A-703 GUARDRAIL SECTION DETAIL

Scale: 1 1/2" = 1'-0"



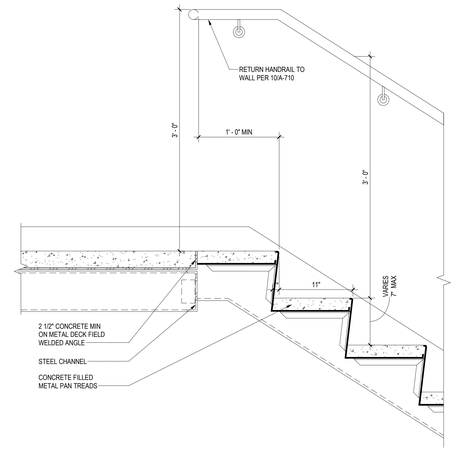
8 A-703 HANDRAIL EXTENSION AT BASE OF STAIR

Scale: 1 1/2" = 1'-0"



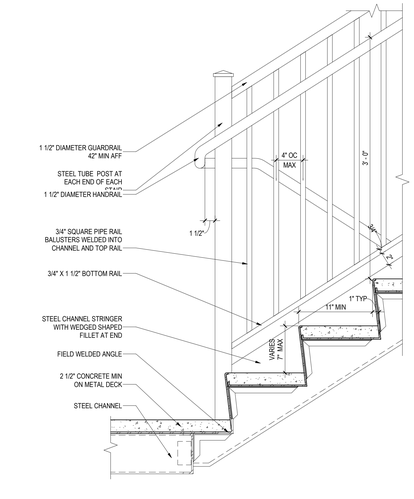
7 A-703 HANDRAIL EXTENSION AT BOTTOM OF LANDING

Scale: 1 1/2" = 1'-0"



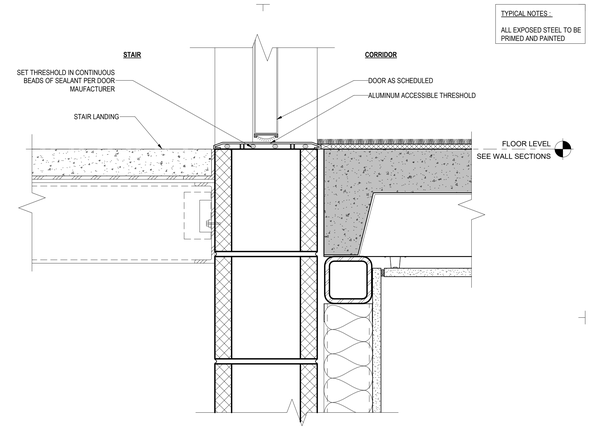
6 A-703 HANDRAIL EXTENSION AT TOP OF LANDING

Scale: 1 1/2" = 1'-0"



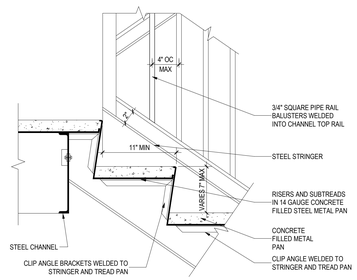
5 A-703 GUARDRAIL DETAIL

Scale: 1 1/2" = 1'-0"



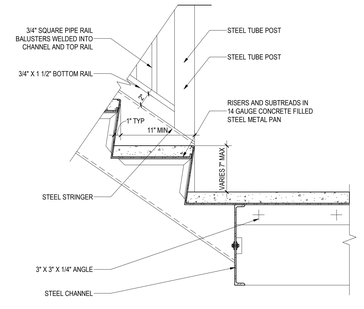
4 A-703 DOOR SILL AT STAIR

Scale: 3" = 1'-0"



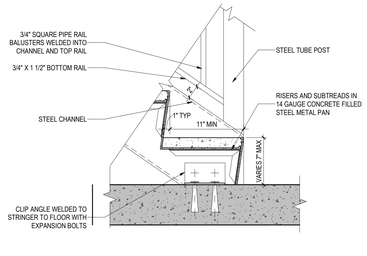
3 A-703 TOP LANDING DETAIL AT STAIR

Scale: 1 1/2" = 1'-0"



2 A-703 BOTTOM LANDING DETAIL AT STAIR

Scale: 1 1/2" = 1'-0"



1 A-703 BASE DETAIL AT STAIR

Scale: 1 1/2" = 1'-0"

TYPICAL NOTES :-

ALL EXPOSED STEEL TO BE PRIMED AND PAINTED

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TYPICAL STAIR DETAILS @ METAL / CONCRETE

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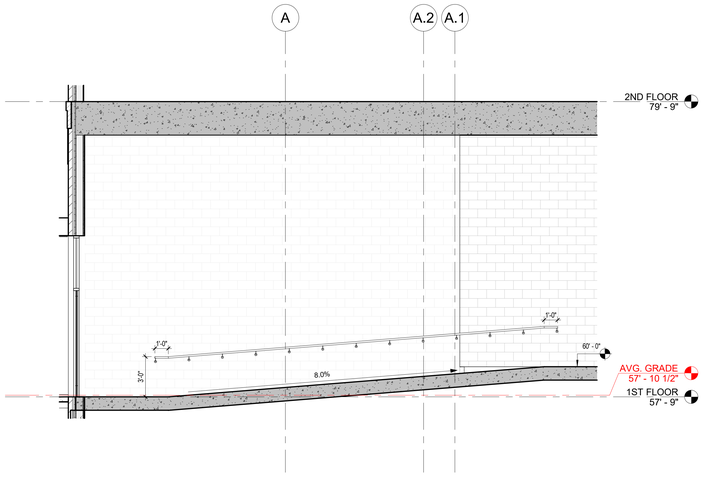
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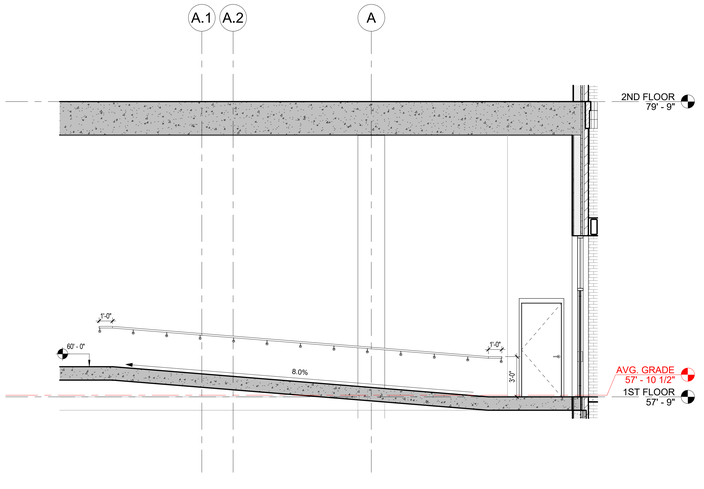
TYPICAL NOTES :-

ALL EXPOSED STEEL TO BE PRIMED AND PAINTED



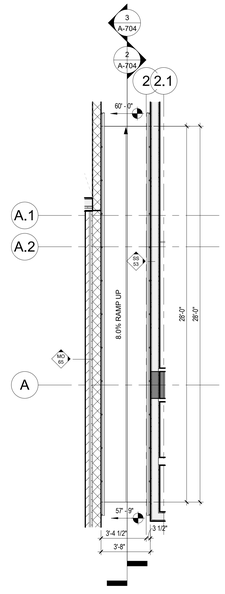
3 A-704 RAMP - SECTION 2

Scale: 1/4" = 1'-0"



2 A-704 RAMP - SECTION 1

Scale: 1/4" = 1'-0"



1 A-704 RAMP - FIRST FLOOR

Scale: 1/4" = 1'-0"

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RAMP - PLANS & SECTIONS

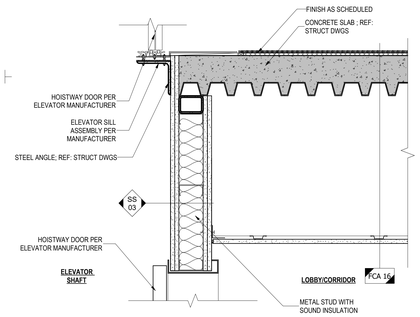
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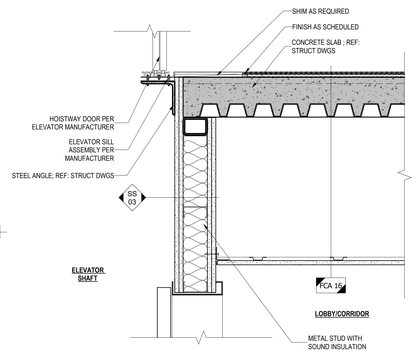
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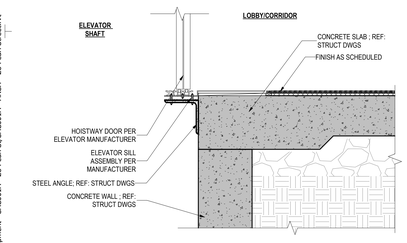
13 A-711 METAL BLDG - ELEVATOR HEAD - OPTION 1

Scale: 1 1/2" = 1'-0"



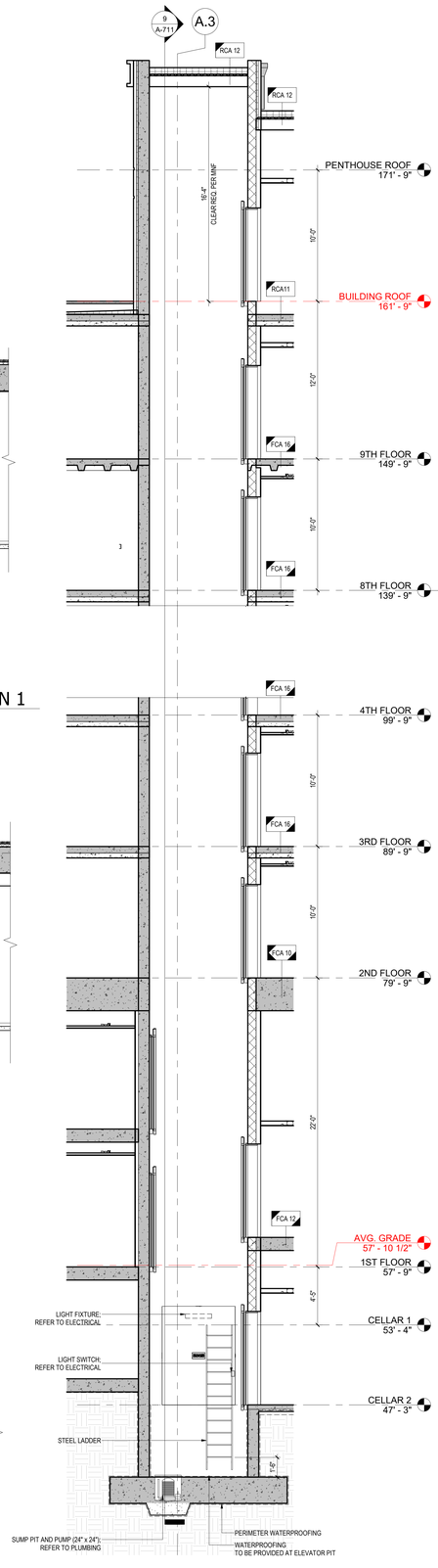
12 A-711 CONCRETE BLDG - ELEVATOR HEAD

Scale: 1 1/2" = 1'-0"



11 A-711 ELEVATOR SILL DETAIL

Scale: 1 1/2" = 1'-0"

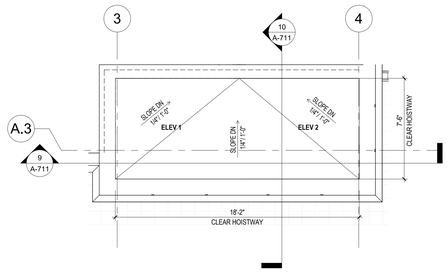


10 A-711 ELEV. 1 & 2 SECTION 2

Scale: 1/4" = 1'-0"

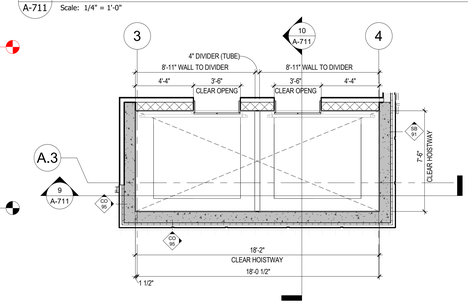
9 A-711 ELEV. 1 & 2 SECTION 1

Scale: 1/4" = 1'-0"



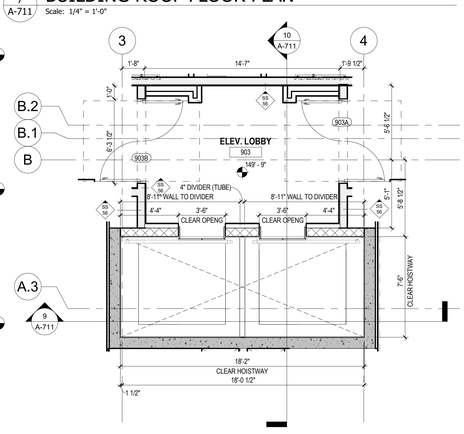
8 A-711 PENTHOUSE ROOF PLAN

Scale: 1/4" = 1'-0"



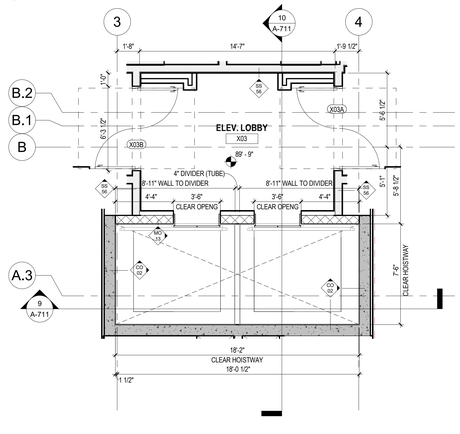
7 A-711 BUILDING ROOF FLOOR PLAN

Scale: 1/4" = 1'-0"



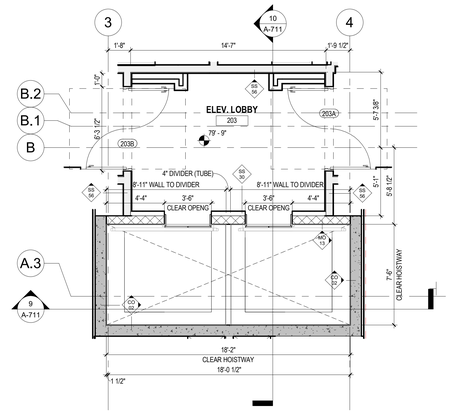
6 A-711 9TH FLOOR PLAN

Scale: 1/4" = 1'-0"



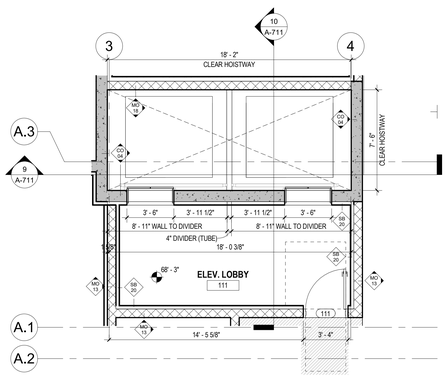
5 A-711 TYPICAL (3RD-8TH) FLOOR PLAN

Scale: 1/4" = 1'-0"



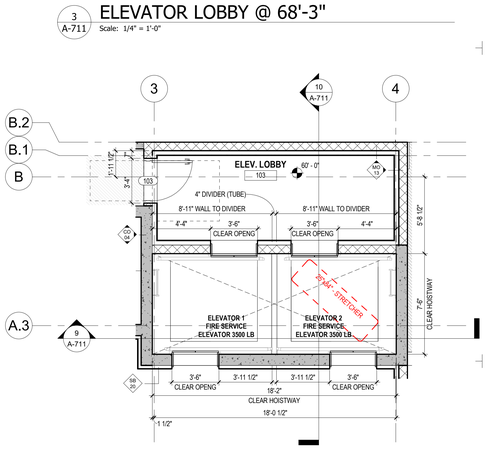
4 A-711 2ND FLOOR PLAN

Scale: 1/4" = 1'-0"



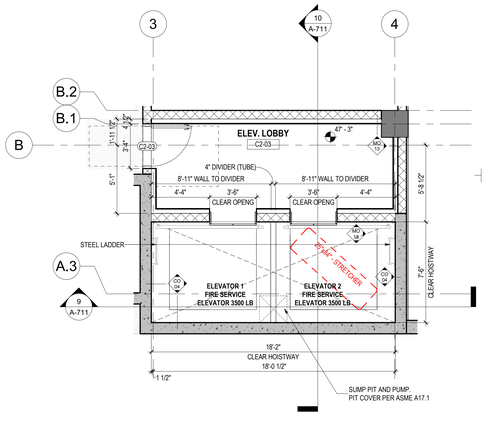
3 A-711 ELEVATOR LOBBY @ 68'-3"

Scale: 1/4" = 1'-0"



2 A-711 FIRST FLOOR PLAN

Scale: 1/4" = 1'-0"



1 A-711 CELLAR 2 FLOOR PLAN

Scale: 1/4" = 1'-0"

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ELEVATOR 1 & 2 - PLAN & SECTIONS / DETAILS

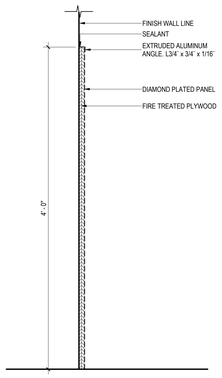
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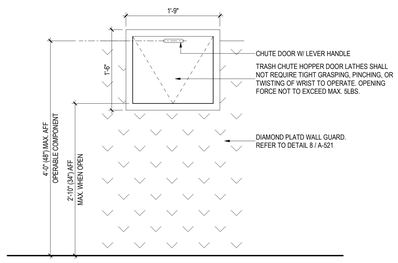
A-711

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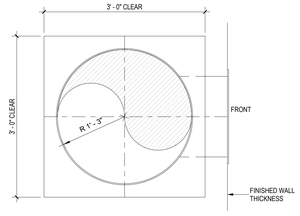
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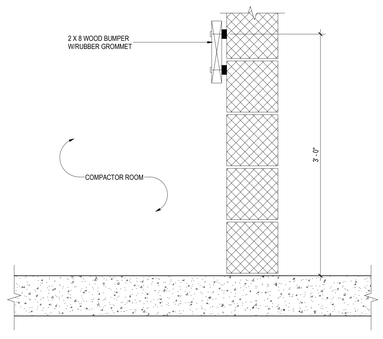
8 A-721 TYPICAL DIAMOND PLATED WALL GUARD
Scale: 1 1/2" = 1'-0"



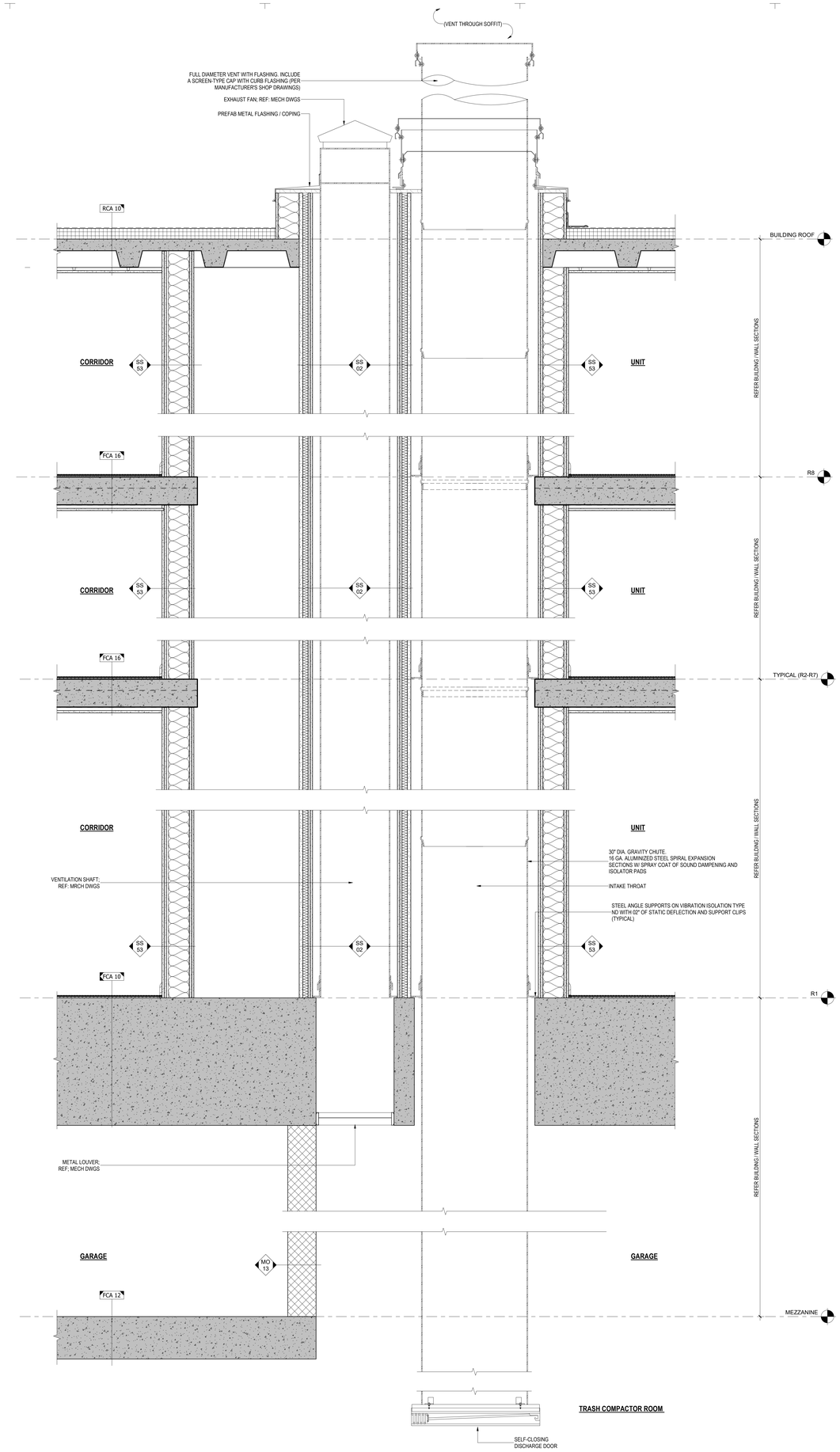
7 A-721 TYPICAL TRASH CHUTE DOOR ELEVATION
Scale: 1" = 1'-0"



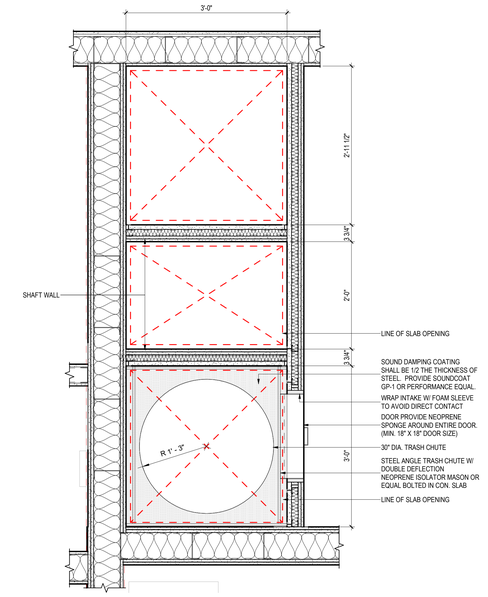
6 A-721 TRASH CHUTE THROAT & FLOOR OPENING
Scale: 1" = 1'-0"



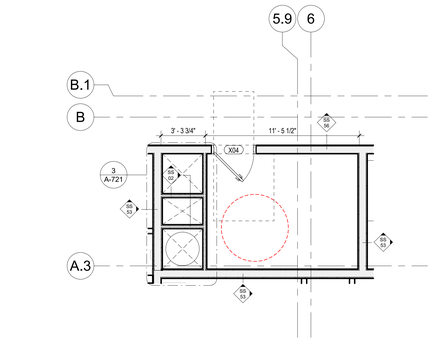
5 A-721 TRASH CHUTE TYPICAL WOOD BUMPER DETAIL
Scale: 1 1/2" = 1'-0"



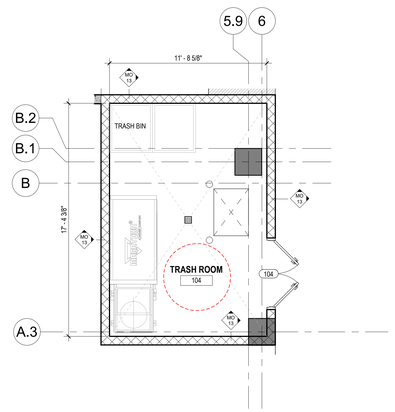
4 A-721 TRASH ROOM SECTION
Scale: 1" = 1'-0"



3 A-721 TRASH CHUTE - TYPICAL FLOOR PLAN
Scale: 1" = 1'-0"



2 A-721 TRASH - TYPICAL FLOOR PLAN
Scale: 1/4" = 1'-0"



1 A-721 FIRST FLOOR PLAN
Scale: 1/4" = 1'-0"

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FILE NAME:

A-721

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Fire door selection chart

Series	630	631	634	635
Label				
UL/ULC/FM 1½ or 3 hr	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)		Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)
UL 4 hr	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm) FM 4 hour is an option	Up to 13'6" (4,115 mm) width/height, max. 152 sf (14.121 sm)
UL oversized door	Over 152 sf (14.121 sm)	Over 152 sf (14.121 sm)	Over 152 sf (14.121 sm)	Over 152 sf (14.121 sm)
FM (optional) oversized door	Over 152 sf (14.121 sm), but less than 18' (5,486 mm) height or width. Over 18' must be certified by FM*		Over 152 sf (14.121 sm), but less than 18' (5,486 mm) height or width. Over 18' must be certified by FM*	Over 152 sf (14.121 sm), but less than 18' (5,486 mm high)*
Applications				
Masonry/steel	●	●	●	●
Non-masonry	●	●		●
Standard				
Maximum width	41'2" (12,548 mm)	14' (4,267 mm)	41'2" (12,548 mm)	24' (7,351 mm)
Maximum height	25'4" (7,722 mm)	12' (3,658 mm)	25'4" (7,722 mm)	24' (7,351 mm)
Curtain material	Painted galvanized steel/stainless steel	Painted galvanized steel	Painted galvanized steel/stainless steel	Painted galvanized steel/stainless steel
R-value**				4.5
Sound transmission class				21 STC†
Finish color	Gray/Tan/White/Brown	Gray/Tan/White/Brown	Gray/Tan/White/Brown	Gray/Tan/White/Brown
Available Options				
Fire Sentinel® time-delay release device	●	●	●	●
Smoke detectors	●	●	●	●
FireLite® vision lites	●	●	●	●
UL listed brush-type smoke seals	●	●	●	●
Windload (FBC, TDI, Miami-Dade)	●		●	●
Operation options				
Push-up	Up to 80 sf (7.43 sm)	Up to 80 sf (7.43 sm)	Up to 80 sf (7.43 sm)	
Chain hoist	●	●	●	●
Crank	●	●	●	●
Electric motor	●	●	●	●
Locking option				
Slide locks or cylinder locking bottom bar w/mortise cylinder	●	●	●	●
Finish options				
Approximately 200 powder coat premium colors	●	●	●	●

* FM reviews designs for openings over 18' (5,486 mm) wide
Information is subject to change. Please call your local Overhead Door™ Distributor for special applications or if your application is not listed. All 635 Series doors are chain hoist minimum.

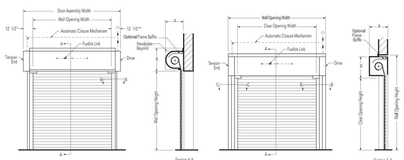
** R-value Overhead Door Corporation uses a calculated door section R-value for our insulated doors.

† Sound transmission classification.

Door clearance elevations

Operation: crank, chain hoist, electric
Chain hoist has only one sash chain located on drive side.

Face-of-wall mounted	Between jambs mounted



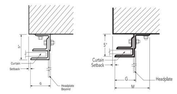
* Add 7" for crank operation.

* Options may effect clearance dimensions.
For more detailed information, consult your local Overhead Door™ Distributor.

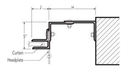
Angle guide

Face-of-wall mounted		Between jambs mounted
E guide	Z guide	

Section B-B



Drive Side - Electric, Chain or Crank
Section B-B

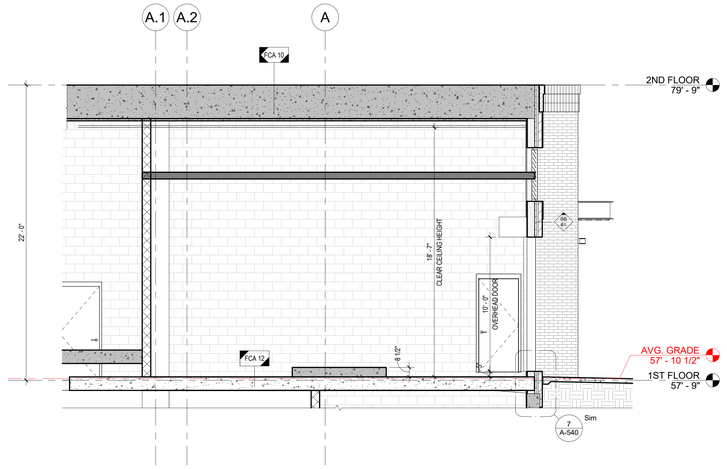


Whenever expansion mounting bolts are used maintain a minimum of 6 bolt diameters from edge of wall.

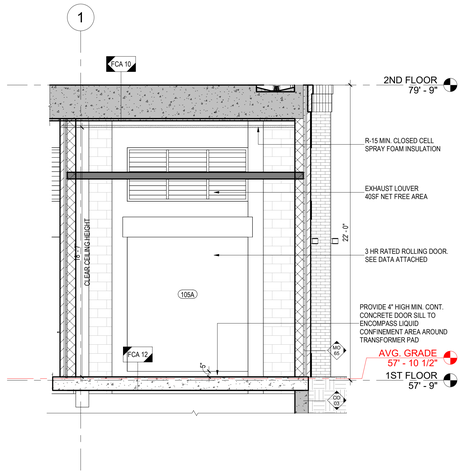
Tension side & push-up drive side
Section C-C



Whenever expansion mounting bolts are used maintain a minimum of 6 bolt diameters from edge of wall.

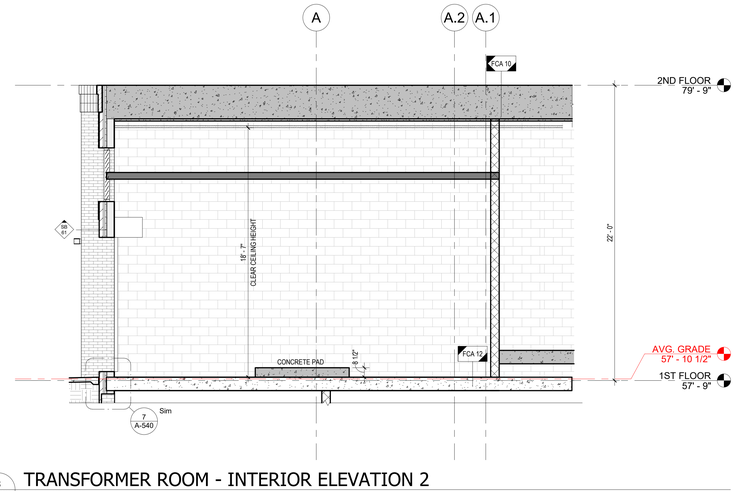


5 A-730 TRANSFORMER ROOM - INTERIOR ELEVATION 4
Scale: 1/4" = 1'-0"

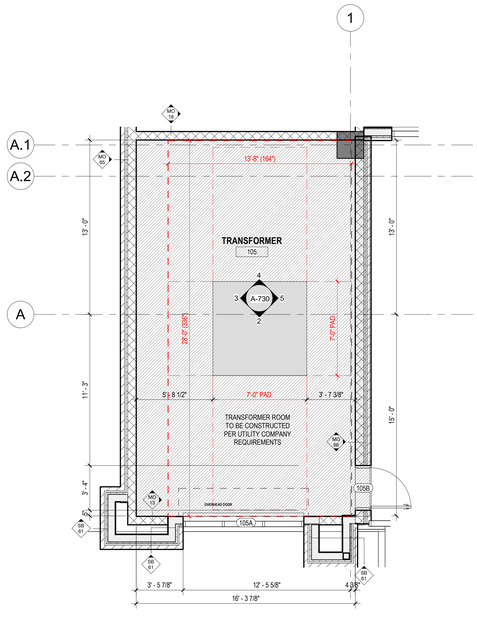


2 A-730 TRANSFORMER ROOM - INTERIOR ELEVATION 1
Scale: 1/4" = 1'-0"

4 A-730 TRANSFORMER ROOM - INTERIOR ELEVATION 3
Scale: 1/4" = 1'-0"



3 A-730 TRANSFORMER ROOM - INTERIOR ELEVATION 2
Scale: 1/4" = 1'-0"



1 A-730 FIRST FLOOR PLAN
Scale: 1/4" = 1'-0"

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TRANSFORMER ROOM - PLAN & INTERIOR ELEVATIONS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
DRAWN BY: Author
CHECKED BY: Checker
PLOT DATE: 2/7/2025 10:18:46 AM
FILE NAME:

A-730

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GENERAL REQUIREMENTS

1. Drawing notes and specifications are instructions to the Contractor and apply generally to all the work unless more specific information is shown elsewhere on the drawings or written in the specifications.
2. Conform to the *2020 Building Code New York State* any amendments adopted by the local governing authority.
3. Take dimensions to centers of columns, beams, piers, and pilasters; faces of walls; and to edges of openings unless shown otherwise.
4. The Contractor shall coordinate these structural drawings with architectural, mechanical, electrical, landscape, and other drawings; and fabrication and field conditions. Where discrepancies exist between structural and other drawings, the Contractor shall notify the Architect and Structural Engineer immediately and wait for instruction.
5. The roof shall be sloped to drain minimum 1/8" per foot, or as shown on architectural drawings. Slope on flat roof framing shall be attained through tapered insulation.
6. Roof drains shall be kept unclogged by regular maintenance to prevent water build-up on roof.
7. See mechanical and architectural drawings for size and location of all openings in roof, floors, and walls not shown on these drawings. Openings larger than 12" must be reinforced, unless noted otherwise on plan.
8. If conditions encountered during construction differ from what is shown on the contract drawings, the Structural Engineer shall be notified immediately and work shall not progress until all problems are resolved to the satisfaction of the Structural Engineer.
9. The Contractor shall provide all shoring and bracing required to maintain the safety and stability of the structure throughout construction.
10. Structural work supporting mechanical equipment shall be verified with the Equipment Supplier and Mechanical Engineer prior to fabrication and construction.
11. The structural construction documents represent the finished structure. They do not indicate the method of construction. The Contractor shall provide all measures necessary to protect the structure during construction. Such measures shall include, but not be limited to: racing, shoring for loads due to construction equipment, etc. The Structural Engineer shall not be responsible for the Contractor's means, methods, techniques, sequences for the procedure of construction, or the safety precautions and the programs incident thereto (nor shall observation visits to the site include inspection of these items).
12. Notes and details on these drawings shall take precedence over general structural notes. Where no details are shown, construction shall conform to similar work on the project.
13. In the event that discrepancies exist between the project specifications and the general structural notes, here possible the stricter or most conservative requirement shall be followed. In all other cases the Contractor shall inform the Architect or Structural Engineer and await instruction. Discrepancies between the general structural notes and the project specifications shall not be permitted as a basis for the Contractor's failure to comply with the requirements of the project specifications or as a basis for claims for additional work.
14. This project is pursuing LEED Certification. For this reason, the project has specific sustainability performance targets that each contractor should be aware of. Refer to 01 81 13 Sustainable Design Requirements in Division 1.

DESIGN CRITERIA

GOVERNING BUILDING CODE
2020 Building Code of New York State

DESIGN LOADS

1ST & 2ND FLOOR
- Dead Load:
  - Typical Floor Slab: Varies from 135 psf to 150 psf
- Live Load:
  - Parking: 40 psf
  - Lobby: 100 psf
  - Stacker: 125 psf

3RD FLOOR (TRANSFER SLAB)
- Dead Load:
  - Typical Floor Slab: Varies from 305 psf to 460 psf
- Live Load:
  - Dwelling units: 40psf w/ live load reduction as per Code
  - Stairs and Corridors: 100psf
  - Lobby, Indoor Amenity: 100psf
  - Terrace: 100psf or 300lbs (concentrated load for worker)

TYPICAL FLOOR
- Dead Load:
  - Dwelling units: 75 psf
  - Corridors: 75 psf
- Live Load:
  - Dwelling units: 40 psf w/ Live Load reduction as per Code
  - Stairs and Corridors: 100 psf
  - Storage/Mechanical Rooms: 125 psf
  - Lobby, Indoor Amenity: 100 psf

ROOF
- Live Load:
  - Terrace: 100 psf or 300 lbs (Concentrated load for worker)
  - Upper Roof: 30 psf snow load
- Dead Load:
  - Green Roof: 125 psf (Extensive Green Roof = 35 psf)

ROOF SNOW LOADS
- Ground Snow Load (Pg): 30 psf
- Flat Roof Snow Load (Pf): 30 psf + Drift
- Snow Exposure Factor (Ce): 1.0
- Snow Load Importance Factor (I): 1.0
- Thermal Factor (Ct): 1.1

WIND LOADS
- Basic Wind Speed: 117 mph
- Wind Importance Factor (I): 1.00
- Building Category: II
- Wind Exposure: B
- Interior Pressure Factor: ± 0.18
- Daign Wind Pressure (C&C):
  - Zone 4: 33 psf
  - Zone 5: 58 psf

EARTHQUAKE DESIGN DATA
- Risk Category: II
- Important Factor: 1.0
- Site Class: B
- Spectral Response Coefficients:
  - Ss=0.265g
  - S1=0.071g
  - SMS=0.265g
  - SM1=0.071g
  - SDS=0.177g
  - SD1=0.047g
- Design Category: B
- Basic Seismic-force Resisting System: Concrete Shear Walls/Light Framed Wall Using Flat Strap Bracing
- Design Modification: R 4.0
- Design Base Shear: 317k (Cs=0.01)
- Analysis Procedure: Equivalent Lateral Force
- Rain Intensity: 5.49 in/h

FOUNDATION DESIGN BASIS
Foundations based on Geotechnical report by SESI Consulting Engineers dated April 22, 2022. The Geotechnical Report recommends that the foundation shall bear on rock with a prescribed allowable bearing capacity of 12ksf.

EARTHWORK AND EXCAVATION

1. The site within the footprint of all proposed construction shall be cleared of all vegetation and organic material until acceptable subgrade material is met that conforms with requirements of the project specifications and Geotechnical Engineer's recommendations. The top 12" of subgrade shall be compacted to 95% of dry density, or as required by the Geotechnical Engineer.
2. All fill and backfill being used under slabs, or other structural applications, shall meet the requirements as per the Geotechnical report.
3. No fill or backfill containing stones over 3", frozen material, debris, or organic matter will be permitted.
4. All fill within 6" of the bottom of slabs shall be "Non-frost susceptible". Unified classification groups GW, SW, GP, and SP with a maximum of 3% passing the #200 sieve meet this requirement. These are clean sands and gravel.
5. This Project is pursuing LEED MR Credit 4.2: Recycled Content. Therefore contractor is required to have a minimum recycled content for crushed fill to be 100%.
6. This Project is pursuing LEED MR Credit 5.2: Regional Materials. Contractor's ability to source crushed fill that has been extracted/reclaimed within 500 miles will be considered during bid process. Regional sourcing is required where possible.

FOUNDATIONS AND RETAINING WALLS

1. The Architect and Structural Engineer assume no responsibility for the truth of the subsurface conditions presented on the drawings and in boring or test pit reports. The data is intended for the preparation of bids and subsequent construction. They represent conditions only at those specific locations at the time they were made.
2. All foundation/retaining walls shall be adequately braced during construction to maintain safety and stability. Backfilling shall not be permitted until floor structures are completed and concrete has achieved 7 day strength.
3. Carry exterior foundations down at least 36 inches below the lowest exterior grade within 6 feet of the face of footing.
4. Footings shall be cast 4" into undisturbed soil having a minimum bearing capacity called for in the Design Criteria.
5. Finish footing excavations with hand tools.
6. Prevent soils supporting foundations from freezing. Remove any frozen soil and replace with concrete if under footings or with compacted granular fill if under slabs on grade.
7. Provide 10 mil vapor barrier under all slabs on grade. Lap joints at least 6 inches.
8. Provide perimeter foundation insulation. See Architectural drawings for more information.

REINFORCING STEEL

1. Conform to the *Manual of Standard Practice for Detailing Reinforced Concrete Structures*, ACI 315; the *Standard Specification for Structural Concrete in Buildings*, ACI 301; and the *Building Code Requirements for Reinforced Concrete*, ACI 318.
2. Submit shop drawings for approval prior to fabrication.
3. Provide reinforcing steel meeting the standards of ASTM A615 Grade 60.
4. Provide welded wire fabric in flat sheets meeting the standards of ASTM A185.
5. Lap splices, unless noted otherwise, shall be class "B" tension lap splices. Run reinforcing bars continuously lapped at splices and around corners. Dowel into intersecting walls and hook at ends. Stagger splices minimum of one lap length wherever possible.
6. At edges of openings provide 2-#5 in slabs (top and bottom) and 2-#6 in walls and grade beams (one each face) extending 2'-0" beyond opening or hooked if needed.
7. Provide, and schedule on shop drawings, accessories to hold reinforcing in position. Space high chairs no more than 48" apart, wire to bottom reinforcing. Provide #5 support bars on high chairs. Space slab bolsters no more than 3'-6" apart.
8. Clearance of main reinforcing bars from adjacent concrete surfaces shall be:

Structural Element and Condition	Minimum Cover (inches)
Concrete cast against and permanently exposed to earth	3
Concrete exposed to weather	
#6 through #18 bars	2
#5 bar, W31, or D31, and smaller	1 1/2
Concrete not exposed to weather or in contact with ground	
Slabs, walls, and joists: #11 bar and smaller	3/4
Beams, columns: primary reinf., ties, stirrups, and spirals	1 1/2*

* Carry tops of stirrups in concrete beams to within 1" of concrete surface.

The maximum allowable deviation from the figures above, when placing reinforcing in the forms shall be 1/4" for concrete shapes 10" or less in depth or width and 1/2" for concrete shapes more than 10" in depth or width.

9. Where not scheduled, provide #3 stirrups at 12" o.c. Stirrups are closed unless noted otherwise.
10. Place temperature bars perpendicular to all main reinforcing bars and lap 36 bar diameters. Place temperature bars in upper layer for bottom steel and in lower layer for top steel.
11. Do not cut or displace reinforcing steel to accommodate the installation of embedded items without approval from the Structural Engineer.
12. This Project is pursing LEED MR Credit 4.2: Recycled Content. Therefore, Contractor is required to use rebar with a minimum recycled steel content of 50% post consumer. Many steel products contain 90% or higher recycled content if manufactured by electric arc furnace process.
13. This Project is pursuing LEED MR CREDIT 5.2: Regional Materials. Contractor's ability to source rebar that has been extracted/reclaimed within 500 miles will be considered during bid selection process. Regional sourcing is required where possible.

CONCRETE

1. Comply with the latest edition of the *Standard Specification for Structural Concrete in Buildings*, ACI 301; and the *Building Code Requirements for Reinforced Concrete*, ACI 318.
2. Center footings and piers under supported members, unless shown otherwise.
3. Contractor shall coordinate with work of all other trades and where required install all built-in work, sleeves, inserts, etc. as required. Install only steel, cast iron pipe, or PVC pipe sleeves in concrete slabs, beams and walls. All utility pipes that penetrate the foundation shall penetrate the concrete stem wall above the footing. Where utility pipe is lower in elevation than top of footing, the footing shall be stepped to a lower elevation to accommodate the penetration.
4. Seat concrete beams at least 4 inches into walls. Reinforce beam to wall joints with 2-#6 bars top and bottom.
5. Proportion, mix, and place concrete under the supervision of an approved concrete control engineer.
6. All structural members shall be poured for their full depths in one operation.
7. Provide concrete with 28 day compressive strengths for the following uses:

Use	Strength (psi)
Lean concrete for mud mats	2000
Spread footing & Mat Foundation	4000
Concrete Columns	6000
Structural slabs, shear walls, beams, stairs and ramps up to 3rd floor	6000
Structural slabs, shear walls, beams, stairs 4th thru Roof	4000

8. Contractor shall submit concrete mix report with compression test results to Structural Engineer for review prior to start of foundation construction. Representative test cylinders shall be taken from the concrete in accordance with concrete specifications. Testing shall be performed at 7 and 28 days.
9. Provide 6% air entrained concrete exposed to earth or weather or in parking areas & driveways.
10. Reinforce slabs placed on ground with a minimum of 6" x 6" - W1.4 x W1.4 welded wire fabric, lapped 12" on sides and ends.
11. Provide dowels into footings to match vertical bars.
12. Do not omit, relocate, or add construction joints unless approved by the Structural Engineer. Expansion joints are mandatory as shown.
13. Provide dowels, 2" x 4" minimum keyways, and 24 bar diameter lap minimum of reinforcement at all construction joints. Allow 48 hours to elapse between adjacent slab pours. Provide waterstops in basement slabs on grade and foundation walls.
14. Provide keyed construction joints no greater than 40 feet apart in foundation walls.
15. Slab on grade to be poured in strips. Construction or control joints shall have spacing in either direction in accordance with the following chart:

Slab Thickness	Spacing (+/- 2 feet)
4"	16'-0"
5"	18'-0"
6"	20'-0"
7"	22'-0"
8"	24'-0"
9"	26'-0"
10"	28'-0"
Greater than 10"	30'-0" maximum

16. All wall and pier footings shall have a minimum thickness of 12" and project 6" beyond pier or wall faces, unless noted otherwise.
17. Mechanically vibrate all concrete when placed. Maximum slump of 4 1/2" for concrete without plasticizer. If plasticizer is used, a higher final slump may be allowed upon approval of the Structural Engineer. No fly ash additive is allowed.
18. Top of all foundation walls and piers shall be level.
19. All exposed edges of concrete above finished floor shall have a 3/4" x 3/4" chamfer.
20. Provide #3 nosing bar at each concrete step.
21. All concrete for parking deck, including slab on grade shall contain a calcuim nitrate based corrosion inhibitor such as D.C.I. manufactured by W.R. Grace or approved equal.
22. Although protective measures were incorporated in the design, Owner shall develop a maintenance plan at all pouring areas and ramps to prevent excessive cracking & deterioration.
23. See Architectural drawings for surface finish requirements.
24. Hard trowel finish not allowed for slab with added air content.

STRUCTURAL STEEL

1. All steel fabrication and erection shall conform to the latest edition of *AISC Manual of Steel Construction Allowable Stress Design*.
2. Provide structural steel having a minimum yield strength of 50 ksi that meets ASTM A992, Standard Specifications for Structural Steel. Hollow Structural Steel (e.g. steel tubes) shall conform to ASTM A500, Grade B. Plates and angle sections to meet 36 ksi, A36 requirements.
3. Submit shop drawings showing erection plans, fabricated assemblies, and accessories. Show member designations, sizes, and connections. The member designation on the erection drawings shall clearly show the drawing number the shop piece is located on.
4. Beam simple connections shall be designed to withstand one half the maximum allowable uniform load for each particular beam and span condition shown or the load indicated on the drawings, whichever is greater. Shop connections shall be bolted or welded.
5. Beam moment connections, where indicated on these drawings, shall be designed for the entire moment capacity of the specified beam. Fabricator shall provide sealed calculations.
6. Welding shall be in accordance with AWS specifications using E70-XX electrodes. All welding shall be performed by welders holding valid certificates and having current experience in the type of weld shown on the drawings or notes. Certificates shall be those issued by an accepted testing agency. All welding done by E70 series low hydrogen rods unless noted otherwise. All welding per latest American Welding Society standards, (except steel joists shall comply with Steel Joist Institute standards).
7. These drawings assume that all welds are shop welds, unless otherwise indicated. Shop welds and field welds shall be shown on the shop drawings submitted for review.
8. All full (complete) penetration welds shall be tested in accordance with AISC specifications.
9. All bolts shall be 3/4" diameter ASTM A-325N in accordance with AISC specifications and holes shall be 13/16" diameter, unless noted otherwise.
10. All expansion or epoxy bolts to have ICBO rating for material into which installation takes place.
11. All steel shall be thoroughly cleaned of rust, dirt, loose mill scale, and other foreign matter. After cleaning, steel shall be shop primed with one coat of metal primer. Primer to be rust inhibiting primer. Specifications to be submitted for approval prior to painting. Paint coats shall be full wetting, applied thoroughly and evenly to surfaces and free from spray dust, runs or sags. Do not paint steel surfaces intended to be welded or where spray on fireproofing shall be applied.
12. Structural steel exposed to weather or other severe conditions shall be painted. Submit paint specification and color for approval.
13. After erection, touch up paint all field connections and abraded surfaces with same type of material used for shop coating.
14. Drypack shall be 5000 psi, non-shrink grout, five star or equivalent. Install drypack below all bearing/leveling plates under columns and beams..
15. Provide steel decks that meet American Iron and Steel CFSD-ASD. All steel decks shall extend a minimum 3 spans where possible.
16. This Project is pursing LEED MR Credit 4.2: Recycled Content. Therefore contractor is required to have a minimum recycled content for all steel products and materials in this section to be 50% post-consumer.
17. This Project is pursuing LEED MR Credit 5.2: Regional Materials. Contractor's ability to source steel materials that have been extracted/reclaimed within 500 miles will be considered during bid selection process. Regional sourcing is required where possible.

MASONRY

1. All masonry shall be constructed in accordance with the requirements of the National Concrete Masonry Association and the latest edition of *Specifications for Masonry Structures*, ACI 530.1.
2. Hollow concrete masonry units shall conform to ASTM C90, Grade N, Type 1, F'm = 2000 psi, running bond, unless noted otherwise.
3. Mortar shall be Type S, 1800 psi, unless noted otherwise.
4. Fill two courses of block with mortar under all lintel bearing areas. Minimum lintel bearing length is 8".
5. Masonry anchors and ties connecting masonry to structural steel shall be provided at 32" o.c. maximum.
6. All masonry walls shall be constructed with ladder type horizontal joint reinforcement at every other course minimum. Provide ladder type horizontal reinforcing at every course below grade.
7. Provide vertical control joints in masonry walls such that no straight run of wall exceeds 24'-0". Control joints shall not occur at wall intersections, ends, within 24" of concentrated points of bearing or jambs, or over openings unless noted otherwise on the structural documents.
8. Mechanically vibrate grout into vertical spaces immediately after pouring and again 5 minutes later.
9. Provide cleanouts if grout lift exceeds 4'-0" in block walls. Maximum grout lift shall be 8'-0".
10. All masonry below finished grade shall be grouted solid.
11. Place masonry units on full mortar bed in all courses of bearing walls, piers, foundation walls, columns, and pilasters.
12. Vertical reinforcing shall extend through bond beams where shown. Cut bottom of masonry unit to accommodate vertical bar. Grout cavities below bond beam prior to installation of bond beam course.
13. This Project is pursuing LEED MR Credit 4.2: Recycled Content. Therefore contractor is required to use 20% recycled material preconsumer for Concrete Masonry Units (CMU).
14. This Project is pursuing LEED MR Credit 5.2: Regional Materials. Contractor's ability to source masonry materials that have been extracted/reclaimed within 500 miles will be considered during bid selection process. Regional sourcing is required where possible.

COLD FORMED STEEL FRAMING

1. All cold formed steel framing (studs and tracks) shall meet the requirements of the *2001 AISI Specification for the Design of Cold Formed Steel Structural Members*.
2. Provide mill certified,G60 galvanized steel meeting ASTM A 1003/A 1003M Structural Grade, Type H, metallic coated. Members 16 gauge and thicker shall have a minimum yield strength of 50 ksi that meets ASTM A 1003/ A 1003M, Grade ST50H. Members 18 gauge and thinner shall have a minimum yield strength of 33 ksi that meets ASTM A 1003/ A 1003M, Grade ST33H. Unless noted otherwise, track framing members shall be manufactured from steel meeting the minimum requirements of ASTM A 1003/ A 1003M, Grade ST33H = 33 ksi.
3. Any changes in framing products or methods must be submitted to the Engineer for approval prior to construction, and must be accompanied by drawings and calculations signed and sealed by a professional engineer in the State of New Jersey.
4. The cold formed steel framing product descriptions and nomenclature shown in these drawings adhere to the Steel Stud Manufacturers Association (SSMA). The sections are defined in the following sequence:

WEB DEPTH -- PROFILE TYPE -- FLANGE WIDTH -- MATERIAL THICKNESS (mills)

Profile type 'S' denotes a C shaped stud with flange return lips. Profile type 'T' denotes track components without flange return lips. For example, a 3-5/8" x 18 gauge 'C' stud with 1-5/8" flanges would be denoted 362S162-43.

5. The absolute minimum delivered uncoated base steel thickness of the framing components shall be:

Gauge	Mils	Thickness (inches)
20	33	0.0341
18	43	0.0451
16	54	0.0566
14	68	0.0714
12	97	0.1012

6. C-Studs shall be formed with these minimum return lip lengths corresponding to the flange widths shown:

Flange Width	SSMA Designation	Return Lip Dimension
1 3/8"	137	5/16"
1 5/8"	162	1/2"
2"	200	9/16"
2 1/2"	250	11/16"

The manufacturing tolerance of the return lip shall be (-)1/16" / (+)1/8".

7. C-studs shall have punched webs.
8. Track pieces shall be formed with a 1 1/4" flange and an unpunched web, unless noted otherwise.
9. Unless noted otherwise, refer to literature published by ITW Buildex, Inc., Itasca, IL, for self drilling screw load carrying capacities and installation requirements.
10. Screw penetration through joined materials shall not be less than three exposed threads. Select screws with an adequate cutting tip to accommodate the thickness to be drilled. Drilling must be completed before threads engage the material.
11. Refer to literature by Hilti, Inc., Tulsa, OK, for anchor bolts and powder actuated fasteners (paf's) load carrying capacity and installation requirements.
12. Stud ends must be square cut, unless otherwise shown. Axial loaded single and multiple studs and headers shall be seated in tracks to assure transfer of load. The maximum gap between the track web and end of the stands shall not exceed 1/32".
13. Uniform and level bearing support shall be provided. If not provided, install full size shims as necessary.
14. Installation of shear wall assemblies must be completed before the attachment of sheathing products and floor or roof components.
15. Mechanical bridging, spaced at intervals as shown herein, shall be installed prior to attachment of sheathing and loading.
16. Field cutting of steel framing members shall be by saw or shear. Torch cutting is not permitted.
17. Where required, temporary bracing shall be provided and remain in place until the work is completely stabilized.
18. Splicing of framing, other than as shown in these drawings, is not permitted.
19. All welding shall be performed in accordance with AWS.
20. a This Project is pursuing LEED MR Credit 4.2: Recycled Content. Therefore contractor is required to have minimum recycled content for all cold form steel framing to be 25% post-consumer.
21. This Project is pursuing LEED MR Credit 5.2: Regional Materials. Contractor's ability to source steel materials that have been extracted/reclaimed within 500 miles will be considered during bid selection process. Regional sourcing is required where possible.

SHOP DRAWINGS

1. Shop drawings shall be submitted for all structural items in addition to items required by architectural specifications. Required shop drawings shall include, but are not limited to:

   Concrete Reinforcing
   Structural Steel
   Cold Formed Metal Framing
   Exterior Cladding Support Elements
   Shoring and Formwork

2. The Contractor shall review all shop drawings prior to submittal. Items not in accordance with contract documents shall be flagged upon his review. The general contractor must address all questions and required verifications during the review; any of these questions or verifications that cannot be answered by the Contractor shall be flagged "Architect/Engineer Verify". Shop drawings that are not stamped as APPROVED by the General Contractor shall not be reviewed. Unapproved shop drawings by the Contractor shall be corrected and approved prior to submitting them to the Structural Engineer.
3. The Contractor is responsible for verifying all dimensions, lengths, spans, elevations, required embedment, etc.
4. The Engineer has the right to approve or disapprove any changes to contract documents at any time before or after shop drawing review.
5. ANY REPRODUCTION OF THE ORIGINAL STRUCTURAL DOCUMENTS ON THE SHOP DRAWINGS IS PROHIBITED AND WILL BE AN AUTOMATIC DISAPPROVAL OF ALL SHOP DRAWINGS INCLUDED WITH THE PACKAGE. Any shop drawings not approved for this reason shall be re-submitted as clean copies (not containing the Engineer's stamp).
6. The shop drawings do not replace the contract documents. Items omitted or shown incorrectly and are not flagged by the Structural Engineer or Architect are not to be considered changes to contract documents. It is the Contractor's responsibility to make sure items are constructed to contract documents.
7. The adequacy of engineering designs and layout performed by others rests with the designing or submitting authority.
8. Corrections or comments made on the shop drawings during review do not relieve the Contractor from compliance with the requirements of the drawings and specifications. The review is intended to check for general compliance with the design concept of this project and general compliance with the information given in the contract documents.
9. The Contractor is responsible for confirming or correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating work with that of all other trades; and performing the work in a safe and satisfactory manner.

SPECIAL INSPECTIONS

1. Special Inspections shall be done in accordance with the Statement of Special Inspections submitted for the project.
2. The Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the Building Code. It includes a Schedule of Special Inspection Services applicable to this project.
3. The Special Inspector shall keep records of all inspections and shall furnish inspection reports to the Building Official, Structural Engineer and Architect of Record.
4. The Special Inspection program does not relieve the Contractor of his or her responsibilities.
5. A Final Report of Special Inspections documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted at the completion of construction.
6. The construction divisions which require special inspections for this project include, but are not limited to:

   Steel Construction
   Concrete Construction (Cast in place and precast)
   Masonry Construction
   Cold Formed Metal Framing
   Pile Foundations

7. The qualifications of all personnel performing Special Inspection activities are subject to approval of the Building Official.
8. The inspection and testing agent shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official prior to commencing work.
9. The person administering the Special Inspections program shall be a Professional Engineer experienced in the design of buildings and licensed in the State of New Jersey

CONTRACTOR DESIGNED SYSTEMS

1. The following systems shall be designed by the Contractor:

   Cold Formed Metal Framing
   Steel Connections
   Architectural Ornamental and Applicable Supports
   Prefabricated Equipment Rails
   Window Washing Tie Backs or Davit Systems
   Metal Stairs
   Exterior Cladding Systems

2. See architectural drawings for remaining contractor designed items.
3. Contractor shall provide shop drawings and calculations for Christie Engineering's review. These shall include loads imposed on the structure.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (pounds)
1. Apartments (see residential)	—	—
2. Access floor systems Office use Computer use	50 100	2,000 2,000
3. Armories and drill rooms	150[a]	—
4. Assembly areas Fixed seats (fastened to floor) Follow spot, projections and control rooms Lobbies Movable seats Stage floors Platforms (assembly) Other assembly areas	60[a] 50 100[a] 100[a] 150[a] 100[a] 100[a]	—
5. Balconies and decks[b]	Same as occupancy served	—
6. Catwalks	40	300
7. Cornices	60	—
8. Corridors First floor Other floors	100 Same as occupancy served except as indicated	—
9. Dining rooms and restaurants	100[a]	—
10. Dwellings (see residential)	—	—
11. Elevator machine room and control room grating (on area of 2 inches by 2 inches)	—	300
12. Finish light floor plate construction (on area of 1 inch by 1 inch)	—	200
13. Fire escapes On single-family dwellings only	100 40	—
14. Garages (passenger vehicles only) Trucks and buses	40[a]	Note a See Section 1607.7
15. Handrails, guards and grab bars	See Section 1607.8	
16. Helipads	See Section 1607.6	
17. Hospitals Corridors above first floor Operating rooms, laboratories Patient rooms	80 60 40	1,000 1,000 1,000
18. Hotels (see residential)	—	—
19. Libraries Corridors above first floor Reading rooms Stack rooms	80 60 150[a,h]	1,000 1,000 1,000
20. Manufacturing Heavy Light	250[a] 125[a]	3,000 2,000
21. Marquees, except one- and two-family dwellings	75	—
22. Office buildings Corridors above first floor File and computer rooms shall be designed for heavier loads based on anticipated occupancy Lobbies and first-floor corridors Offices	80 — 100 50	2,000 — 2,000 2,000

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (pounds)
23. Penal institutions Cell blocks Corridors	40 100	—
24. Recreational uses: Bowling alleys, poolrooms and similar uses Dance halls and ballrooms Gymnasiums Ice skating rink Reviewing stands, grandstands and bleachers Roller skating rink Stadiums and arenas with fixed seats (fastened to floor)	75[a] 100[a] 100[a] 250[a] 100[a,n] 100[a] 60[a,n]	—
25. Residential One- and two-family dwellings: Uninhabitable attics without storage Uninhabitable attics with storage[i,l,k] Habitable attics and sleeping areas[k] Canopies, including marquees All other areas Hotels and multifamily dwellings: Private rooms and corridors serving them Public rooms[a] and corridors serving them	10 20 30 20 40 40 100	—
26. Roofs All roof surfaces subject to maintenance workers Awnings and canopies: Fabric construction supported by a skeleton structure All other construction, except one- and two-family dwellings Ordinary flat, pitched, and curved roofs (that are not occupiable) Primary roof members exposed to a work floor Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages All other primary roof members Occupiable roofs: Roof gardens Assembly areas All other similar areas	5 Nonreducible 20 20 100 100[a] Note 1	300 2,000 300 Note 1
27. Schools Classrooms Corridors above first floor First-floor corridors	40 80 100	1,000 1,000 1,000
28. Scuttles, skylight ribs and accessible ceilings	—	200
29. Sidewalks, vehicular driveways and yards, subject to trucking	250[d,n]	8,000[c]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (pounds)
30. Stairs and exits One- and two-family dwellings All other	40 100	300[f] 300[f]
31. Storage warehouses (shall be designed for heavier loads if required for anticipated storage) Heavy Light	250[e] 125[e]	—
32. Stores Retail First floor Upper floors Wholesale, all floors	100 75 125[e]	1,000 1,000 1,000
33. Vehicle barriers	See Section 1607.8.3	
34. Walkways and elevated platforms (other than exitways)	60	—
35. Yards and terraces, pedestrians	100[a]	—

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kN/m^2, 1 pound = 0.004448 kN, 1 pound per cubic foot = 16 kg/m^3.

a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of this Table or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4½ inches by 4½ inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.

b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:
   1. The nominal book stack unit height shall not exceed 90 inches;
   2. The nominal shelf depth shall not exceed 12 inches for each face; and
   3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.

c. Design in accordance with ICC 300.

d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall be considered where appropriate.

e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.

f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.

g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).

h. See Section 1604.8.3 for decks attached to exterior walls.

i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

j. Uninhabitable attics with storage are those where the maximum clear height between the joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses.
   The live load need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:
   i. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches; and
   ii. The slopes of the joists or truss bottom chords are no greater than two units vertical in 12 units horizontal.
   The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.

k. Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.

l. Areas of occupiable roofs, other than roof gardens and assembly areas, shall be designed for appropriate loads as approved by the building official. Unoccupied landscaped areas of roofs shall be designed in accordance with Section 1607.12.3.

m. Live load reduction is not permitted unless specific exceptions of Section 1607.10 apply.

Sheet List	
Sheet Number	Sheet Name
S-100	GENERAL NOTES AND DESIGN CRITERIA
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S-201	TYPICAL FOUNDATION DETAILS-1
S-202	TYPICAL FOUNDATION DETAILS-2
S-203	COLUMN SCHEDULE & DETAILS
S-300	FIRST FLOOR FRAMING PLAN
S-301	UPPER FIRST FLOOR PARKING LEVEL FRAMING PLAN
S-302	SECOND FLOOR FRAMING PLAN
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S-401	TYPICAL CONCRETE FRAMING DETAILS-2
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S-404	TYPICAL MASONRY DETAILS
S-500	3RD THRU 9TH FLOOR FRAMING PLANS
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S-600	TYPICAL FRAMING SECTIONS
S-601	TYPICAL FRAMING SECTIONS
S-700	SHEAR WALL DETAILS
S-800	TYPICAL LIGHT GAUGE CONNECTION DETAILS-1
S-801	TYPICAL LIGHT GAUGE CONNECTION DETAILS-2

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GENERAL NOTES AND DESIGN CRITERIA

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CEP24-046
DRAWN BY: FPS
CHECKED BY: KP
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FILE NAME:

S-100

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REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION - TABLE 1705.3

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	–	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. INSPECTION OF ANCHORS CAST IN CONCRETE.	–	X	ACI 318:17.8.2	–
3. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST.	X		ACI 318: 17.8.2.4	–
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 3.a.		X	ACI 318: 17.8.2	
4. VERIFYING USE OF REQUIRED DESIGN MIX	–	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
5. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS,AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	–	ASTM C172 ASTM C31 ACI 318: 26.4.5, 26.12	1908.10
6. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	–	ACI 318: 26.5	1908.6, 1908.7, 1908.8
7. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	–	X	ACI: 318: 26.5.3-26.5.5	1908.9
8. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	–	X	ACI 318: 26.11.2	–
9. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	–	X	ACI 318: 26.11.2(b)	–

REQUIRED VERIFICATION AND INSPECTION OF SOILS - TABLE 1705.6

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	–	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	–	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	–	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	–
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	–	X

SPECIAL INSPECTIONS FOR WIND RESISTANCE - TABLE 1705.11
COLD-FORMED STEEL LIGHT FRAME CONSTRUCTION - TABLE 1705.11.2

ITEM FOR MAIN WIND-RESISTING SYSTEM	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. WELDING	–	X
2. SCREW, BOLT, ANCHORING, OR ANY TYPE OF FASTENERS	–	X

SPECIAL INSPECTIONS FOR SESMIC RESISTANCE - TABLE 1705.12
COLD-FORMED STEEL LIGHT FRAME CONSTRUCTION - TABLE 1705.12.3

ITEM FOR MAIN WIND-RESISTING SYSTEM	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. WELDING	–	X
2. SCREW, BOLT, ANCHORING, OR ANY TYPE OF FASTENERS	–	X

SPECIAL INSPECTIONS FOR OPEN WEB JOISTS - TABLE 1706.2.3

TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD
1. INSTALLATION OF OPEN WEB JOISTS			
a. END CONNECTIONS - WELDING OR BOLTING	–	X	SJI SPECIFICATIONS LISTED SECTION 2207.1
b. BRIDING - HORIZONTAL OR DIAGONAL			
1. STANDARD BRIDGING	–	X	SJI SPECIFICATIONS LISTED SECTION 2207.1
2. BRIDGING THAT DIFFERS FROM THE SJI SPECIFICATIONS LISTED IN SECTION 2207.1	–	X	

SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION - TABLE 1705.4

ITEM		SCOPE
1. CONCRETE BASE LEVEL		VERIFY THAT THE CONCRETE BASE IS CONSTRUCTED WITHIN A LEVEL ALIGNMENT TOLERANCE.
2. REINFORCEMENT INSTALLATION		INSPECT PLACEMENT, POSITIONING AND LAPPING OF REINFORCING STEEL
3. GROUTING OPERATIONS		INSPECT PLACEMENT AND CONSOLIDATION OF GROUT. INSPECT MASONRY CLEAN-OUTS FOR HIGH LIFT GROUTING.
4. EVALUATION OF MASONRY STRENGTH		TEST COMPRESSIVE STRENGTH OF MORTAR AND GROUT CUBE SAMPLES (ASTM C780). TEST COMPRESSIVE STRENGTH OF MASONRY PRISMS (ASTM C1314).

INSPECTION TASKS PRIOR TO BOLTING - TABLE N5.6-1

INSPECTION TASKS PRIOR TO BOLTING	QC	QA
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	P
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O
PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM THE SHEAR PLANE)	O	O
PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	O
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	O
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	O
PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	O	O

INSPECTION TASKS DURING BOLTING - TABLE N5.6-2

INSPECTION TASKS DURING BOLTING	QC	QA
FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	O	O
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	O

INSPECTION TASKS AFTER BOLTING - TABLE N5.6-3

INSPECTION TASKS AFTER BOLTING	QC	QA
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	P

O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH BOLTED CONNECTION.

INSPECTION TASKS PRIOR TO WELDING - TABLE N5.4-1

INSPECTION TASKS PRIOR TO WELDING	QC	QA
WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	P	P
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	P	P
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O
WELDER IDENTIFICATION SYSTEM *	O	O
FIT-UP GROOVE WELDS (INCLUDE JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY & LOCATION) • BACKING TYPE AND FIT (IF APPLICABLE)	O	O
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O
FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY & LOCATION)	O	O
CHECK WELDING EQUIPMENT	O	-

* - THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.

INSPECTION TASKS DURING WELDING - TABLE N5.4-2

INSPECTION TASKS DURING WELDING	QC	QA
USE OF QUALIFIED WELDERS	O	O
CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL	O	O
NO WELDING OVER CRACKED TACK WELDS	O	O
ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE	O	O
WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) • PROPER POSITION (F, V, H, OH)	O	O
WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	O	O

INSPECTION TASKS AFTER WELDING - TABLE N5.4-3

INSPECTION TASKS AFTER WELDING	QC	QA
WELDS CLEANED	O	O
SIZE, LENGTH AND LOCATION OF WELDS	P	P
WELDS MEET VISUAL ACCEPTANCE CRITERIA • CRACK PROHIBITION • WELD/BASE-MATERIAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	P	P
ARC STRIKES	P	P
k-AREA *	P	P
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P
REPAIR ACTIVITIES	P	P
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P

* - WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE k-AREA, VISUALLY INSPECT THE WEB k-AREA FOR CRACKS WITHIN 3 IN. (75 mm) OF THE WELD.

O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

SPECIAL INSPECTION REQUIREMENTS - IBC/NY 2015 EDITION

1. THE QUALIFIED AGENCY AND PERSONNEL RETAINED FOR THESE SPECIAL INSPECTION SERVICES SHALL BE APPROVED BY THE OWNER, THE ARCHITECT AND THE ENGINEER OF RECORD PRIOR TO START OF CONSTRUCTION. AN OUTLINE OF THE SCOPE OF SERVICES TO BE PERFORMED BY THE INSPECTING AGENCY IS TO BE SUBMITTED PRIOR TO START OF CONSTRUCTION.
2. IN ACCORDANCE WITH SECTION 1705 OF THE INTERNATIONAL BUILDING CODE 2015 EDITION, WITH AMENDMENTS ADOPTED BY THE 2017 NYS SUPPLEMENT, PERIODIC AND/OR CONTINUOUS INSPECTIONS OF THE CONSTRUCTION PROGRESS SHALL BE MADE BY AN INDEPENDENT APPROVED AGENCY IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

STRUCTURAL STEEL	BC 1705.2.1
COLD-FORMED STEEL DECK	BC 1705.2.2
OPEN-WEB STEEL JOISTS AND GIRDERS	BC 1705.2.3
CONCRETE CONSTRUCTION	BC 1705.3
MASONRY CONSTRUCTION	BC 1705.4
SOILS	BC 1705.6
COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION	BC 1705.11.2
WIND-RESISTING COMPONENTS	BC 1705.11.3
COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION	BC 1705.12.3

STRUCTURAL OBSERVATIONS

1. STRUCTURAL OBSERVATIONS SHALL BE PROVIDED BY A REGISTERED DESIGN PROFESSIONAL OTHER THAN THE ENGINEER OF RECORD. THE DESIGNATED PROFESSIONAL SHALL PERFORM VISUAL OBSERVATIONS OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES AND AT THE COMPLETION OF THE STRUCTURAL SYSTEM FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS. ANY OBSERVED DEFICIENCIES SHALL BE REPORTED IN WRITING TO THE OWNER, THE CODE ENFORCEMENT OFFICIAL, THE ARCHITECT AND THE ENGINEER OF RECORD.
2. AT THE CONCLUSION OF THE WORK, THE DESIGNATED PROFESSIONAL SHALL SUBMIT A WRITTEN STATEMENT TO THE CODE ENFORCEMENT OFFICIAL, INDICATING THAT THE BUILDING WAS CONSTRUCTED IN CONFORMITY WITH THE PLANS FILED WITH THE BUILDING DEPARTMENT, ALL NECESSARY SITE VISITS HAVE BEEN MADE AND THAT ANY REPORTED DEFICIENCIES HAVE BEEN RESOLVED TO THE BEST OF HIS KNOWLEDGE.
3. PRIOR TO THE START OF CONSTRUCTION, THE DESIGNATED INSPECTION AGENCY SHALL SUBMIT A PROPOSED INSPECTION AND TESTING SCHEDULE TO THE ARCHITECT AND ENGINEER OF RECORD FOR REVIEW AND APPROVAL.

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PORT CHESTER, NEW YORK

SPECIAL INSPECTIONS

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	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
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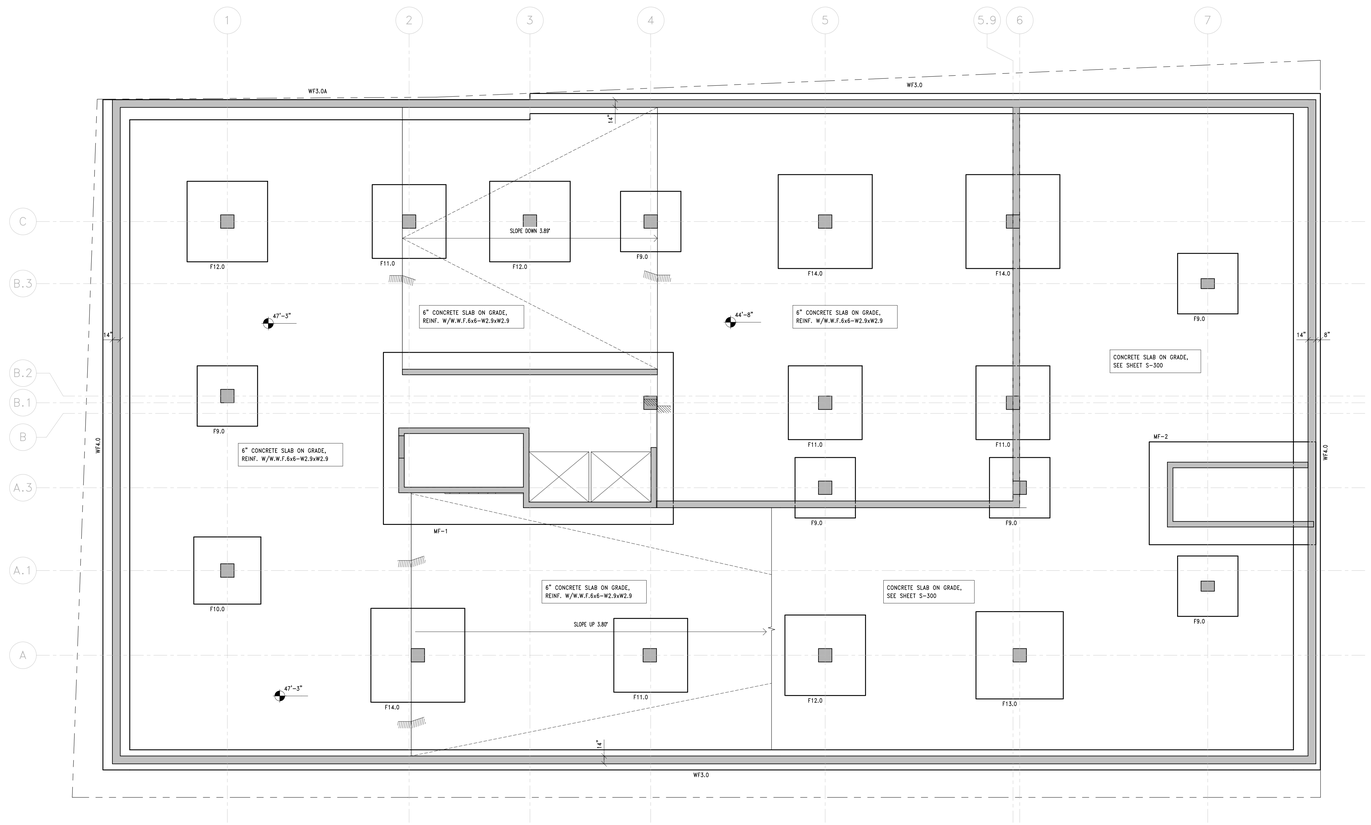
S-101

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FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

NOTES:

1. VERIFY ALL ELEVATIONS AND DIMENSIONS SHOWN W/ ARCHITECTURAL & CIVIL DRAWINGS.
2. TOP OF SLAB ELEVATION VARIES, SEE PLAN.
3. DO NOT EXCAVATE BELOW BOTTOM OF FOOTINGS OF ADJACENT BUILDING FOOTINGS. PROVIDE SUPPORT OF EXCAVATION AS REQUIRED.
4. FOUNDATION BEARING ELEVATIONS TO BE APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO PLACING FOOTINGS.
5. VERIFY ALL COLUMN COORDINATES WITH ARCHITECTURAL DRAWINGS.
6. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
7. SEE GEOTECHNICAL REPORT AND ARCHITECTURAL DWGS. FOR WATERPROOFING BELOW SLAB, BEHIND PERIMETER WALLS.
8. CONTRACTOR TO ADJUST T/FOOTING ELEVATIONS AS NEEDED TO ENSURE THAT THE BOTTOM OF THE FOOTING BEAR ON SUBGRADE THAT IS APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER.
9. BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE MINIMUM 3'-0" BELOW GRADE FOR FROST PROTECTION.
10. TOP OF TYPICAL FOOTING ELEVATION= -1'-2" BELOW TOP OF SLAB U.N.O. ON PLANS THUS [3'-X"].
11. ALL FOOTING BOTTOM REBAR TO BE HOOKED.
12. ALL TOP BARS SHALL BE EPOXY COATED FOR ALL SLABS AND RAMPS IN PARKING AREAS, UNLESS TRAFFIC COATING IS APLIED.
13. ALL ELEVATOR PIT DIMENSIONS AND ELEVATIONS TO BE COORDINATED WITH APPROVED ELEVATOR SHOP DRAWINGS.
14. SEE ARCH EDGE OF SLAB DRAWINGS FOR COLUMN AND WALL LOCATIONS.
15. EXTERIOR FOOTING ELEVATIONS TO BE COORDINATED WITH SOE DRAWINGS.
16. ALL EXCAVATIONS SHALL BE ADEQUATELY SUPPORTED AND APPROVED BY GEOTCHNICAL ENGINEER.
17. FOOTINGS ELEVATIONS TO BE SHOWN ON FOUNDATION SHOP DRAWINGS.
18. TOP OF FOOTING ELEVATIONS SHOWN ARE BASED ON THE UNDERSTANDING THAT THE CONTRACTOR WILL LOWER THE FOOTINGS IF NEEDED BASED ON FILED CONDITIONS AND TO BEAR ON GEOTECH APPROVED SURFACE.
19. TOP OF INTERIOR STRAP BEAM ELEVATION TO MATCH ELEVATION OF FOOTING THAT IS FRAMED INTO.
20. ALL STRAP BEAM REINFORCEMENT SHALL BE EXTENDED THRU FOOTING FAR FACE.
21. ALL COLUMNS AND WALLS ARE CENTERED ON FOOTING U.N.O.

MAT FOUNDATION SCHEDULE

MARK	DEPTH	REINFORCING BOTTOM		REINFORCING TOP		REMARKS
		TRANSVERSE	LONGITUDINAL	TRANSVERSE	LONGITUDINAL	
MF-1	3'-0"					
MF-2	3'-0"					

WALL FOOTING SCHEDULE (12KSF)

MARK	WIDTH	DEPTH	REINFORCING BOTTOM		REINFORCING TOP	
			TRANSVERSE	LONGITUDINAL	TRANSVERSE	LONGITUDINAL
WF3.0	3'-0"	1'-6"	#5@12" O.C.	(4)#5	#5@12" O.C.	(4)#5
WF3.0A	3'-0"	1'-6"	#5@12" O.C.	(4)#5	#5@12" O.C.	(4)#5
WF4.0	4'-0"	1'-6"	#7@12" O.C.	(5)#5	#7@12" O.C.	(5)#5

SPREAD FOOTING SCHEDULE (12KSF)

MARK	SIZE (LxWxD)	REINFORCING BOTTOM		REINFORCING TOP		REMARKS
		TRANSVERSE	LONGITUDINAL	TRANSVERSE	LONGITUDINAL	
F9.0	9'-0"x9'-0"x3'-6"		(12)#8		(12)#8	
F10.0	10'-0"x10'-0"x3'-10"		(14)#8		(14)#8	
F11.0	11'-0"x11'-0"x4'-2"		(16)#8		(16)#8	
F12.0	12'-0"x12'-0"x4'-6"		(16)#9		(16)#9	
F13.0	13'-0"x13'-0"x5'-0"		(18)#9		(18)#9	
F14.0	14'-0"x14'-0"x5'-2"		(20)#9		(20)#9	

CONCRETE GRADE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR			TRANSVERSE TIES		
		TOP	BOTTOM	SIDE BARS	LEGS	SIZE & SPACING	COMMENTS

FOUNDATION LEGEND

MARK	DESCRIPTION
	ON PLAN INDICATES TOP OF SLAB ELEVATION. VERIFY ALL ELEVATIONS WITH ARCHITECTURAL DRAWINGS
[XX.X']	DENOTES TOP OF FOOTING ELEVATION
SF	DENOTES VERTICAL STEP IN FOOTING ELEVATION, SEE TYPICAL DETAILS
	DENOTES CONCRETE COLUMN, SEE SCHEDULE & DETAILS ON S-204
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-202
	DENOTES CONCRETE WALL, SEE SECTIONS AND DETAILS.
F#	DENOTES SPREAD FOOTING, SEE SCHEDULE
WF#	DENOTES WALL FOOTING, SEE SCHEDULE
MF#	DENOTES MAT FOOTING, SEE SCHEDULE
SL-#	DENOTES SLAB TYPE, SEE SCHEDULE
	DENOTES DROP IN SLAB, SEE TYPICAL DETAIL
	DENOTES RAMP UP/DOWN, SEE TYPICAL DETAILS
	DENOTES A STEP IN MAT FOUNDATION, SEE TYPICAL DETAIL
	DENOTES SLAB REINFORCING DIRECTION, SEE SLAB SCHEDULE

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FOUNDATION PLAN

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	25% DD SUBMISSION	12/13/24

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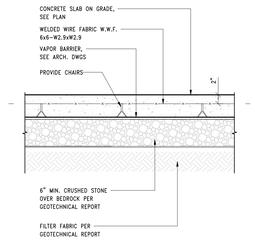
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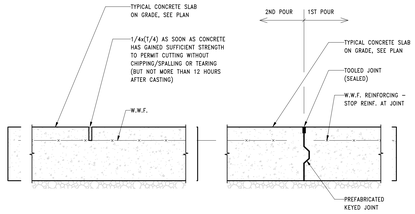
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NOTE: THE SLAB GRADE HAS NOT BEEN DESIGNED AS A PRESSURE SLAB. BASED ON GEOTECHNICAL REPORT, AN UNDERSLAB AND FOUNDATION DRAINAGE SYSTEM MUST BE UTILIZED.

TYPICAL CONCRETE SLAB ON GRADE

NOT TO SCALE

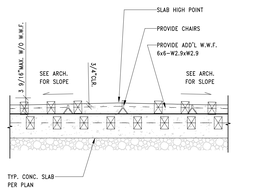


CONTROL JOINT CONSTRUCTION JOINT

NOTES:
1. PROVIDE CONSTRUCTION JOINT AND CONTROL JOINT LOCATIONS FOR OUR REVIEW
2. MAXIMUM SPACING OF CONTROL JOINTS TO BE 35x SLAB THICKNESS.

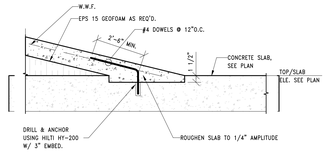
TYPICAL CONCRETE SLAB ON GRADE JOINTS

NOT TO SCALE



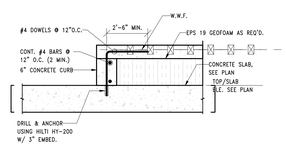
TYPICAL OVER POUR SLAB DETAIL

NOT TO SCALE



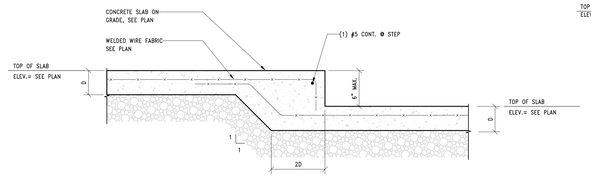
TYPICAL RAMP DETAIL

NOT TO SCALE



TYPICAL BUILT-UP SLAB DETAIL

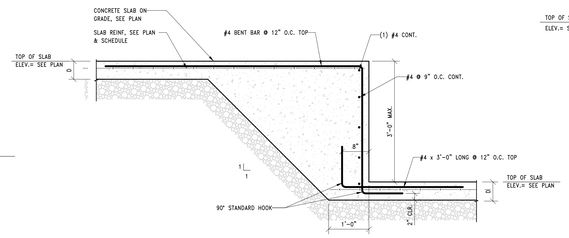
NOT TO SCALE



NOTE: SEE TYPICAL SLAB ON GRADE DETAILS FOR ADDITIONAL INFORMATION

TYPICAL STEPPED SLAB ON GRADE 6" MAXIMUM

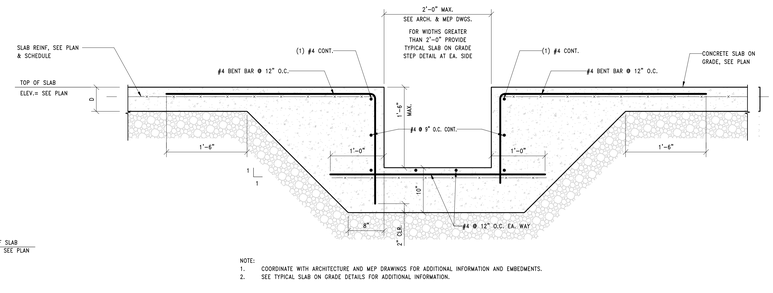
NOT TO SCALE



NOTE: SEE TYPICAL SLAB ON GRADE DETAILS FOR ADDITIONAL INFORMATION

TYPICAL SLAB ON GRADE STEP LARGER THAN 6"

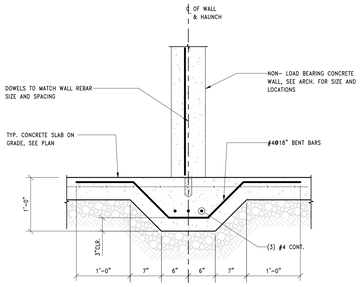
NOT TO SCALE



NOTE:
1. COORDINATE WITH ARCHITECTURE AND MEP DRAWINGS FOR ADDITIONAL INFORMATION AND EMBEDMENTS.
2. SEE TYPICAL SLAB ON GRADE DETAILS FOR ADDITIONAL INFORMATION.

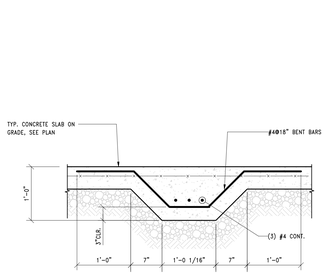
TYPICAL TRENCH AT CONCRETE SLAB ON GRADE

NOT TO SCALE



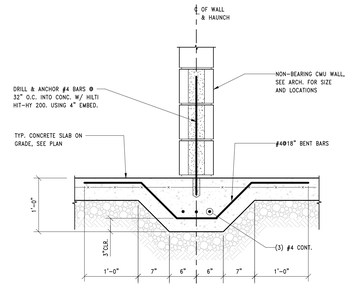
TYPICAL THICKENED SLAB ON GRADE AT CONCRETE PARTITION WALL

NOT TO SCALE



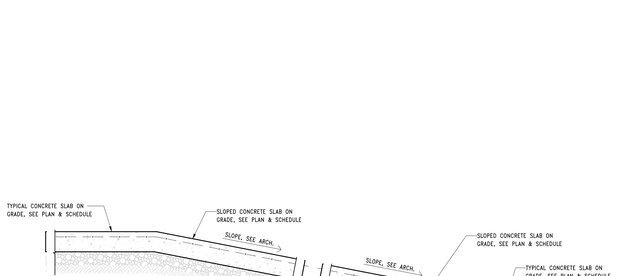
TYPICAL THICKENED SLAB ON GRADE

NOT TO SCALE



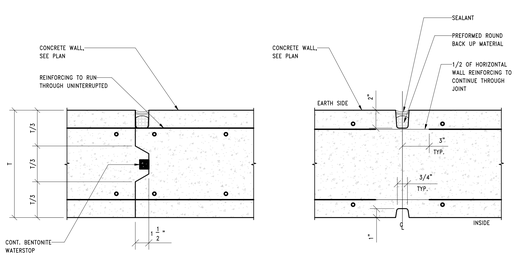
TYPICAL THICKENED SLAB ON GRADE AT MASONRY PARTITION WALL

NOT TO SCALE



TYPICAL SLOPED CONCRETE SLAB ON GRADE DETAIL

NOT TO SCALE



CONSTRUCTION JOINT

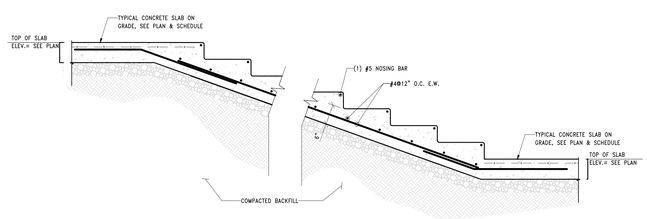
NOTE:
PROVIDE CONSTRUCTION JOINTS AT PLANNED CONTRACTION JOINT LOCATIONS.

WALL CONTRACTION JOINT

NOTE:
CONTRACTION JOINTS SHALL BE SPACED NO FURTHER THAN 20' AND NO FURTHER THAN 10' FROM WALL CORNERS.

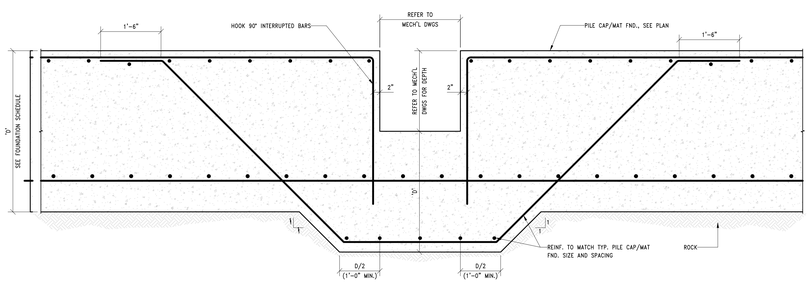
TYPICAL CONCRETE WALL JOINTS

NOT TO SCALE



TYPICAL CONCRETE STAIR ON GRADE

NOT TO SCALE



ELEVATOR SUMP PIT TYP. DETAIL

NOT TO SCALE

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TYPICAL FOUNDATION DETAILS-1

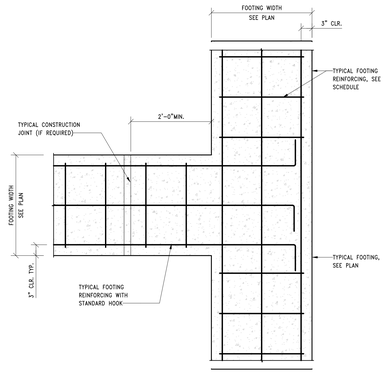
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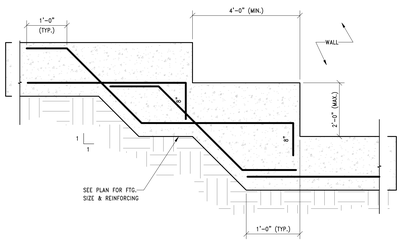
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NYPE No 066442

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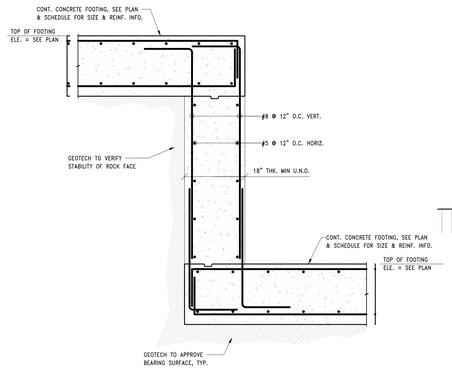
TYPICAL FOOTING INTERSECTION

NOT TO SCALE



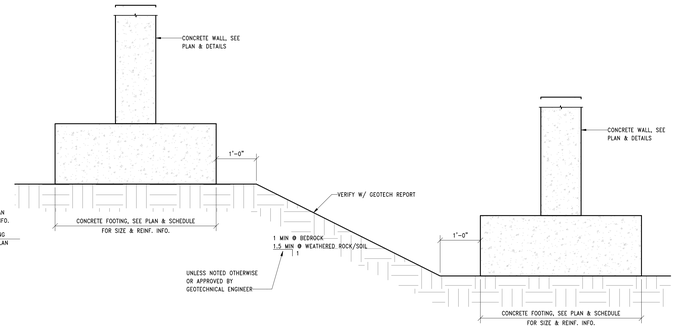
TYPICAL STEPPED WALL FOOTING DETAIL

NOT TO SCALE



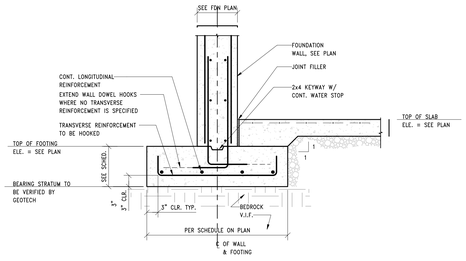
TYPICAL STEPPED FOOTING DETAIL FOR STEP GREATER THAN 3'-0"

NOT TO SCALE



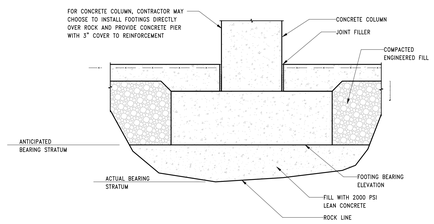
TYPICAL ADJACENT FOOTING ON SOIL/ROCK

NOT TO SCALE



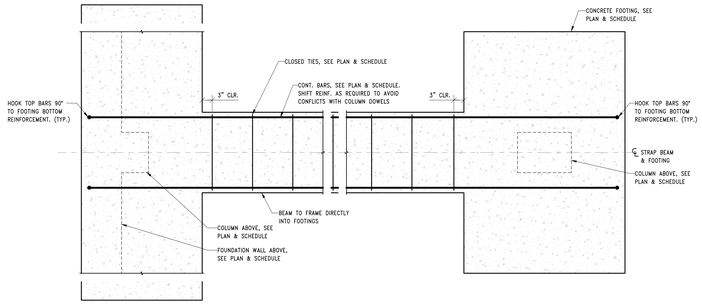
TYPICAL CONTINUOUS FOOTING AT FOUNDATION WALL

NOT TO SCALE



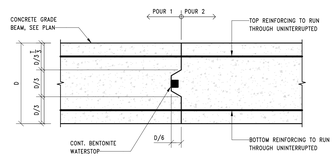
TYPICAL FOOTING DETAIL @ OVER EXCAVATION

NOT TO SCALE



TYPICAL STRAP BEAM FOR FOOTINGS ON SOIL/ROCK

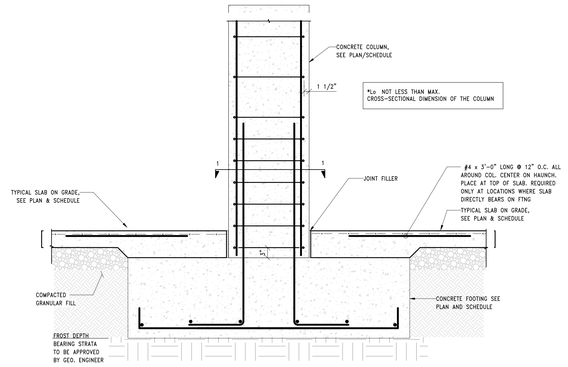
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NOTE:
1. LOCATE JOINTS @ 1/4 x CLEAR SPAN BETWEEN FOOTING/PILE CAPS
2. PROVIDE JOINT LAYOUT FOR APPROVAL BY CHRISTIE ENGINEERING

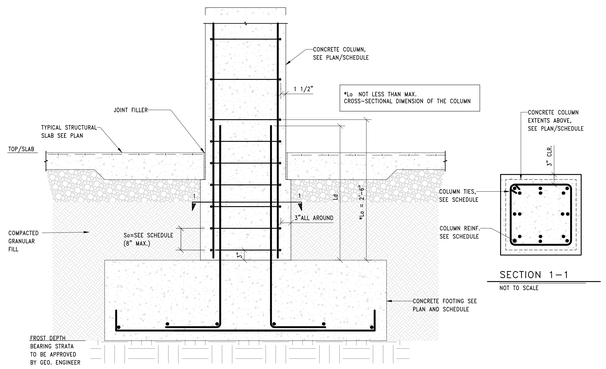
TYPICAL GRADE BEAM CONSTRUCTION JOINT

NOT TO SCALE



TYPICAL CONCRETE COLUMN TO FOOTING DETAIL

NOT TO SCALE

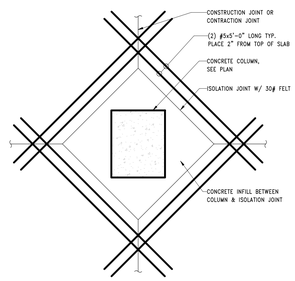


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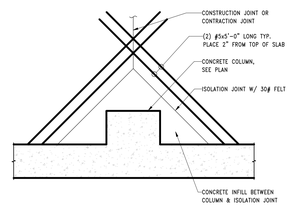
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TYPICAL CONCRETE COLUMN TO FOOTING DETAIL WHERE OVER EXCAVATION IS REQUIRED

NOT TO SCALE



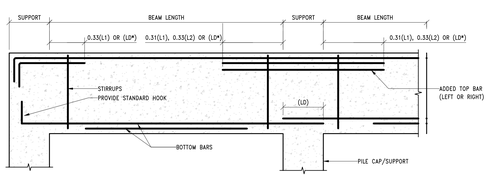
TYP. AT INTERIOR COLUMN



TYP. AT EXTERIOR COLUMN

TYPICAL COLUMN ISOLATION JOINT DETAIL

NOT TO SCALE



NOTES:
1: BEYOND A TERMINATING BEAM, WHERE ADJACENT SLAB IS AT LEAST 5" THICK, EXTEND ALL TOP BARS INTO THE SLAB FOR A DISTANCE OF "LD" BEYOND THE OUTSIDE FACE OF SUPPORT. WHERE BEAM CANTILEVERS BEYOND SUPPORT EXTEND ALL TOP AND BOTTOM BARS TO THE END OF THE CANTILEVERS AND TERMINATE TOP BARS WITH A STANDARD HOOK.

2: THE NUMBER OF REQUIRED VERTICAL LEGS PER STIRRUP IS INDICATED IN THE SCHEDULE. CLOSED STIRRUPS ARE REQUIRED FOR BEAMS WITH CONTINUOUS TOP BARS AND FOR EDGE BEAMS (SPANDRELS). DEVELOPMENT OF STIRRUPS SHALL BE IN ACCORDANCE WITH ACI 318, 12.13. PLACE FIRST STIRRUP AT DISTANCE FROM THE FACE OF SUPPORT EQUAL TO 1/2 THE SCHEDULED FIRST SPACING, OR 3", WHICHEVER IS LESS.

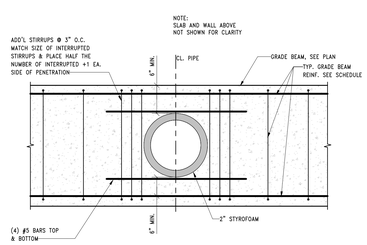
3: AT THE CONTRACTORS OPTION, AND WHERE REQUIRED TO RELIEVE BAR CONGESTION, NOT MORE THEN 50% OF THE BOTTOM BARS MAY BE TERMINATED AT THE SPECIFIED DISTANCE FROM THE FACE OF THE SUPPORT.

4: CONTRACTOR SHALL DETAIL AND SHALL PLACE REINFORCING BARS IN MULTIPLE LAYERS ONLY WHERE REQUIRED TO PROVIDE PROPER CLEARANCES BETWEEN BARS OF THE PROPERLY CLEAR COLUMN VERTICALS.

5: WHERE CONTINUOUS TOP BARS EXCEED 60 FEET IN LENGTH, SPLICE MAY BE MADE AT MID SPAN OF BEAM. WHERE BOTTOM BARS EXCEED 60 FEET IN LENGTH, SPLICE MAY BE MADE OUTSIDE OF MIDDLE THIRD OF BEAM. IN BOTH CASES, SPLICE LENGTH SHALL EQUAL 1.3(LD).
EDGE BEAMS (SPANDRELS) SHALL HAVE AT LEAST ONE-SIXTH OF THE TOP BARS AT THE SUPPORTS AND ONE QUARTER OF THE BOTTOM BARS AT THE MIDSPAN MADE CONTINUOUS AROUND THE PERIMETER AND TIED WITH CLOSED STIRRUPS.

TYPICAL GRADE BEAM REINFORCING DETAIL

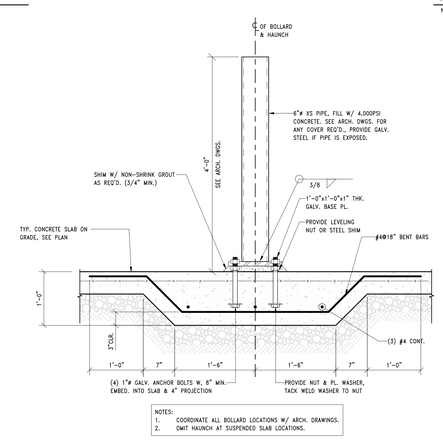
NOT TO SCALE



NOTE:
1. MINIMUM CLR. SPACE BETWEEN ADJACENT PENETRATIONS SHALL BE GREATER OF THE LARGEST PENETRATION DIMENSION OR 2x BEAM DEPTH
2. MINIMUM CLR. DISTANCE BETWEEN EDGE OF PENETRATION AND SUPPORT FACE SHALL BE DEPTH OF BEAM.
3. ALL PENETRATIONS SHALL BE SHOWN IN SHOP DRAWINGS FOR OUR REVIEW AND APPROVAL

TYPICAL PIPE THRU GRADE BEAM

NOT TO SCALE



NOTES:
1. COORDINATE ALL BOLLARD LOCATIONS W/ ARCH. DRAWINGS.
2. OWT HAUNCH AT SUSPENDED SLAB LOCATIONS.

TYPICAL BOLLARD DETAIL

NOT TO SCALE

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TYPICAL FOUNDATION DETAILS-2

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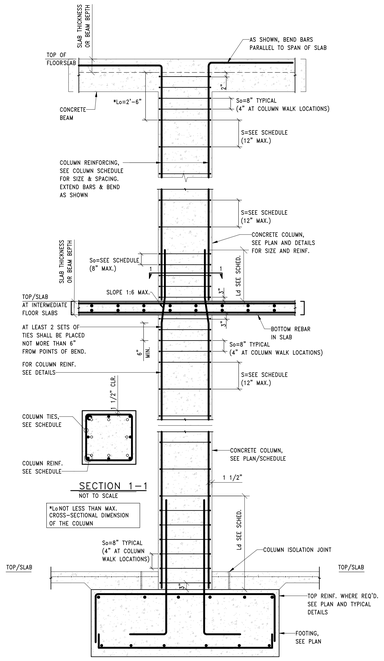
S-202

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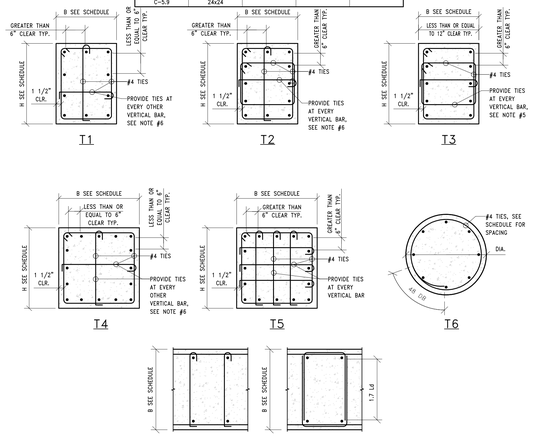


TYPICAL CONCRETE COLUMN REINFORCING DETAIL

NOT TO SCALE

CONCRETE COLUMN SCHEDULE

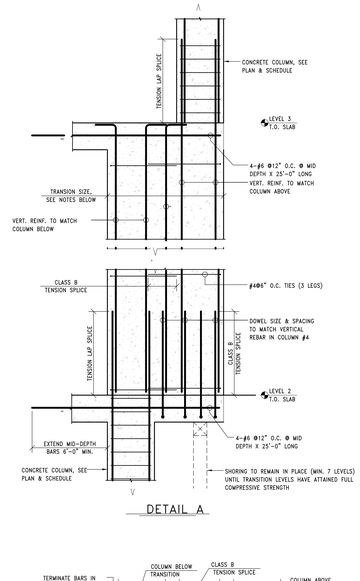
LOCATION	SIZE	VERT. REINF.	TIES	TIE PATTERN
A-2(1'-3 5/8")	24x24			
A-4	24x24			
A-5	24x24			
A-6	24x24			
A.1(-2"-4")-7	18x24			
A.1-1	24x24			
A.3-5	24x24			
A.3-6	24x24			
B.1-4	24x24			
B.1-5	24x24			
B.1-5.9	24x24			
B.2-1	24x24			
B.3(5'-7 3/8")-5	24x24			
B.3(5'-7 3/8")-5.9	24x24			
B.3-7	18x24			
C-1	24x24			
C-2	24x24			
C-3	24x24			
C-4	24x24			
C-5	24x24			
C-5.9	24x24			



NOTES:
1. STAGGER ALL TIE HOOKS.
2. FOR TYPE T1, T2 AND T4 ALL BARS SHALL BE EQUALLY SPACED.
3. FOR TYPE T3 ALL BARS SHALL BE EQUALLY SPACED AROUND PERIMETER ON THE LONG SIDES (2 FACES).
4. FOR TYPE T4 AND T5 ALL BARS SHALL BE SPACED AROUND PERIMETER SUCH THAT VERTICAL BARS ARE EQUALLY SPACED.
5. ADD TIES AT ALL REBAR WHERE CLEAR SPACING BETWEEN VERTICAL REBAR IS MORE THAN 6" AS SHOWN.
6. WHERE CLEAR DISTANCE BETWEEN VERTICAL BARS IS LESS THAN OR EQUAL TO 6", PROVIDE TIES AT EVERY ALTERNATE VERTICAL BAR U.N.O.
7. SEE WALL SCHEDULE FOR WALL DETAILS.

COLUMN TIE DETAILS

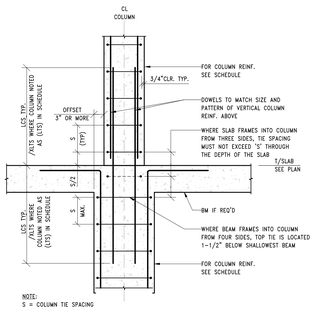
NOT TO SCALE



NOTES:
1. FOR DIMENSIONS AND LOCATIONS OF TRANSITION, SEE PLAN AND COLUMN SCHEDULE.
2. VERTICAL REINFORCEMENT IN TRANSITION TO BE AS SHOWN IN DETAILS A & B UNLESS THE COLUMN SCHEDULE CALLS FOR SPECIFIC VERTICAL REINFORCEMENT IN THE TRANSITION.

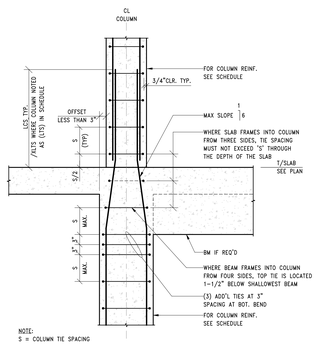
WALKING COLUMN DETAIL AT COLUMN #4

NOT TO SCALE



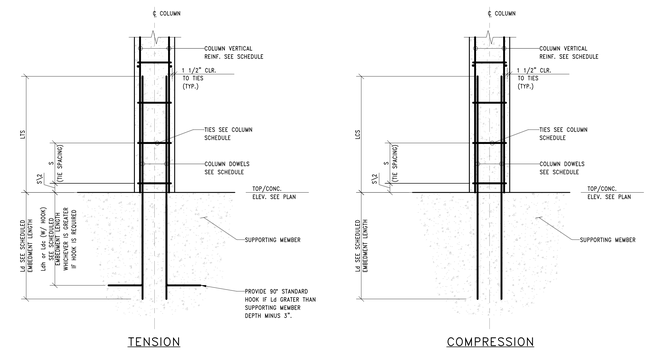
TYPICAL COLUMN OFFSET 3" OR MORE

NOT TO SCALE



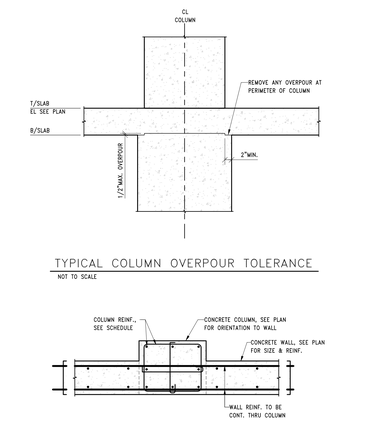
TYPICAL COLUMN OFFSET LESS THAN 3"

NOT TO SCALE



TYPICAL BOTTOM COLUMN DETAILS

NOT TO SCALE



TYPICAL CONCRETE COLUMN IN CONCRETE WALL DETAIL

NOT TO SCALE

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COLUMN SCHEDULE & DETAILS

NO.	DESCRIPTION	DATE
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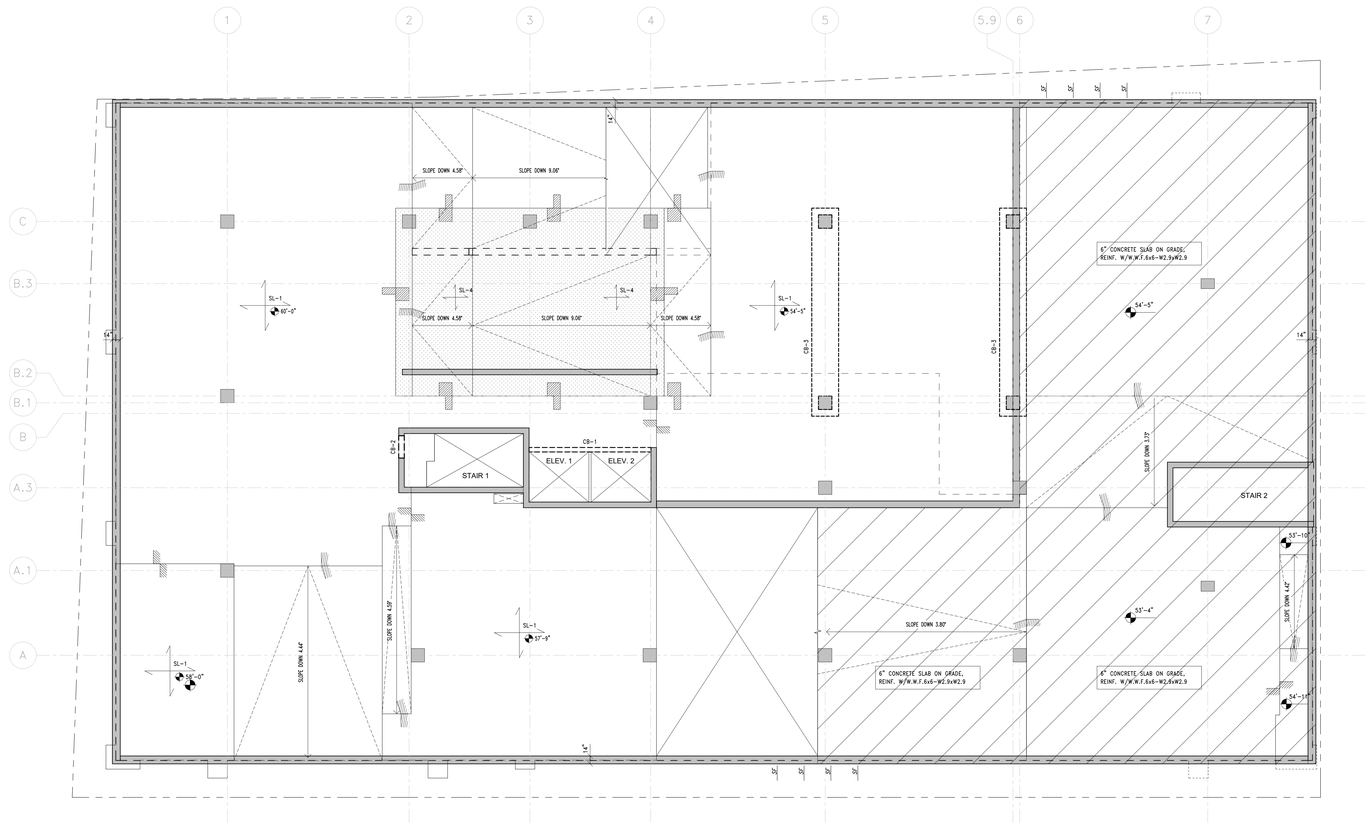
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FIRST FLOOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:
1. VERIFY ALL ELEVATIONS AND DIMENSIONS SHOWN W/ARCHITECTURAL DRAWINGS.
2. TOP OF SLAB ELEVATION = SEE PLAN
3. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
4. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
5. VERIFY ALL COLUMN COORDINATES WITH ARCHITECTURAL DRAWINGS.
6. ALL ADDITIONAL TOP REINFORCEMENT TO BE CENTERED ON COLUMNS (TYPICAL).
7. BOTTOM OF BEAM IN SHEAR WALLS TO BE BASED ON R.O. DIMENSIONS, SEE ARCH. DWGS. AND TYPICAL DETAILS.
8. ALL BARS AT SLAB EDGES TO BE HOOKED.
9. STAIR ATTACHMENT TO BE COORDINATED W/APPROVED DWGS.
10. BOTTOM BARS WILL TERMINATE AT SLAB STEPS WHEN INTERFACED WITH SHALLOWER SLABS. TOP BARS TO CONTINUE FULL LENGTH PER PLAN.
11. ALL TOP BARS SHALL BE EPOXY COATED FOR ALL SLABS AND RAMPS IN PARKING AREAS AND EXPOSED TO WEATHER.
12. REFER TO TYPICAL DETAILS FOR ADDITIONAL SLAB REINFORCEMENT AT SHEAR COLUMN BASE.
13. ALL ADDITIONAL SLAB SHEAR REINF. AND ADDITIONAL REINF. AT SHEAR WALL COLUMN BASE SHALL BE SHOWN IN SHOP DRAWINGS.
14. VERIFY SLOPES OF SLABS WITH ARCHITECTURAL DRAWINGS.

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR			TRANSVERSE TIES	
		TOP	BOTTOM	SIDE BARS	LEGS	SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

SLAB SCHEDULE

MARK	DESCRIPTION
SL-1	12" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-2	24" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #7@12" O.C. BOTTOM E.W.
SL-3	30" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-4	36" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-5	

FRAMING LEGEND

MARK	DESCRIPTION
	DENOTES SLAB REINFORCING DIRECTION, SEE SLAB SCHEDULE
	DENOTES METAL DECK BEARING DIRECTION
SL-#	DENOTES SLAB TYPE, SEE SCHEDULE
CB-#	DENOTES CONCRETE BEAM, SEE SCHEDULE
DB	INDICATES ON PLAN HSSBX4X3/8 ELEVATOR DIVIDER BEAM
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S--
	CONCRETE COLUMN, SEE SCHEDULE
	DENOTES CONCRETE COLUMN ABOVE
	DENOTES RAMP UP/DOWN, SEE TYPICAL DETAILS
	DENOTES DROP IN SLAB, SEE TYPICAL DETAIL
	DENOTES CHANGE IN SLAB THICKNESS, SEE TYPICAL DETAIL
	ON PLAN INDICATES TOP OF SLAB ELEVATION. VERIFY ALL ELEVATIONS WITH ARCHITECTURAL DRAWINGS
	DENOTES WALL ABOVE
	DENOTES MOMENT CONNECTION, SEE TYPICAL DETAIL
SF	DENOTES STEP FOOTING

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FIRST FLOOR FRAMING PLAN

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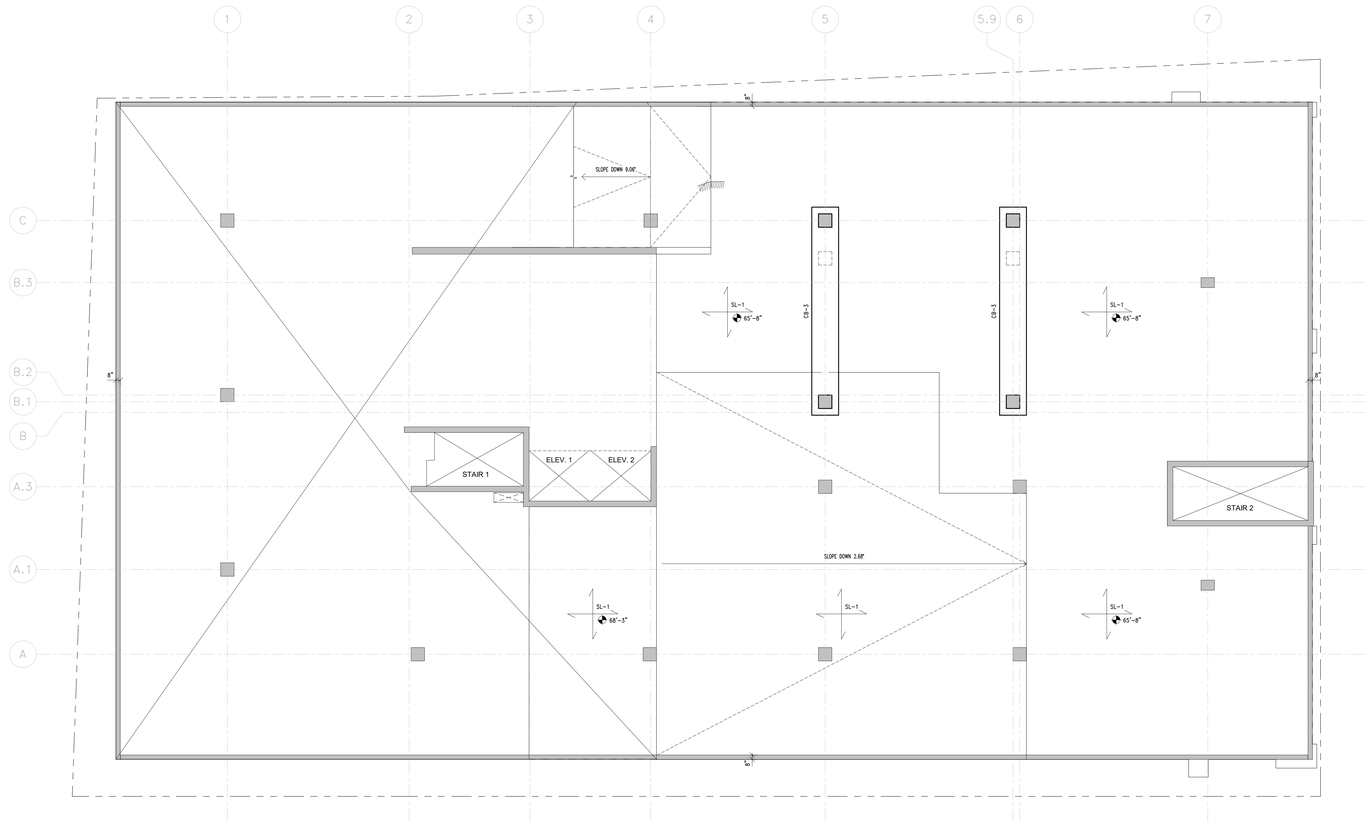
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UPPER FIRST FLOOR PARKING LEVEL FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:
1. VERIFY ALL ELEVATIONS AND DIMENSIONS SHOWN W/ARCHITECTURAL DRAWINGS.
2. TOP OF SLAB ELEVATION = SEE PLAN
3. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
4. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
5. VERIFY ALL COLUMN COORDINATES WITH ARCHITECTURAL DRAWINGS.
6. ALL ADDITIONAL TOP REINFORCEMENT TO BE CENTERED ON COLUMNS (TYPICAL).
7. BOTTOM OF BEAM IN SHEAR WALLS TO BE BASED ON R.O. DIMENSIONS, SEE ARCH. DWGS. AND TYPICAL DETAILS.
8. ALL BARS AT SLAB EDGES TO BE HOOKED.
9. STAIR ATTACHMENT TO BE COORDINATED W/APPROVED DWGS.
10. BOTTOM BARS WILL TERMINATE AT SLAB STEPS WHEN INTERFACED WITH SHALLOWER SLABS. TOP BARS TO CONTINUE FULL LENGTH PER PLAN.
11. ALL TOP BARS SHALL BE EPOXY COATED FOR ALL SLABS AND RAMPS IN PARKING AREAS AND EXPOSED TO WEATHER.
12. REFER TO TYPICAL DETAILS FOR ADDITIONAL SLAB REINFORCEMENT AT SHEAR COLUMN BASE.
13. ALL ADDITIONAL SLAB SHEAR REINF. AND ADDITONAL REINF. AT SHEAR WALL COLUMN BASE SHALL BE SHOWN IN SHOP DRAWINGS.
14. VERIFY SLOPES OF SLABS WITH ARCHITECTURAL DRAWINGS.

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR TOP	LONGITUDINAL REBAR BOTTOM	LONGITUDINAL REBAR SIDE BARS	TRANSVERSE TIES LEGS	TRANSVERSE TIES SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

SLAB SCHEDULE

MARK	DESCRIPTION
SL-1	12" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-2	24" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #7@12" O.C. BOTTOM E.W.
SL-3	30" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-4	36" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-5	

FRAMING LEGEND

MARK	DESCRIPTION
	DENOTES SLAB REINFORCING DIRECTION, SEE SLAB SCHEDULE
	DENOTES METAL DECK BEARING DIRECTION
SL-#	DENOTES SLAB TYPE, SEE SCHEDULE
CB-#	DENOTES CONCRETE BEAM, SEE SCHEDULE
CB	INDICATES ON PLAN HSSBX4X3/8 ELEVATOR DIVIDER BEAM
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-
	CONCRETE COLUMN, SEE SCHEDULE
	DENOTES CONCRETE COLUMN ABOVE
	DENOTES RAMP UP/DOWN, SEE TYPICAL DETAILS
	DENOTES DROP IN SLAB, SEE TYPICAL DETAIL
	DENOTES CHANGE IN SLAB THICKNESS, SEE TYPICAL DETAIL
	ON PLAN INDICATES TOP OF SLAB ELEVATION. VERIFY ALL ELEVATIONS WITH ARCHITECTURAL DRAWINGS
	DENOTES WALL ABOVE
	DENOTES MOMENT CONNECTION, SEE TYPICAL DETAIL
SF	DENOTES STEP FOOTING

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UPPER FIRST FLOOR PARKING LEVEL FRAMING PLAN

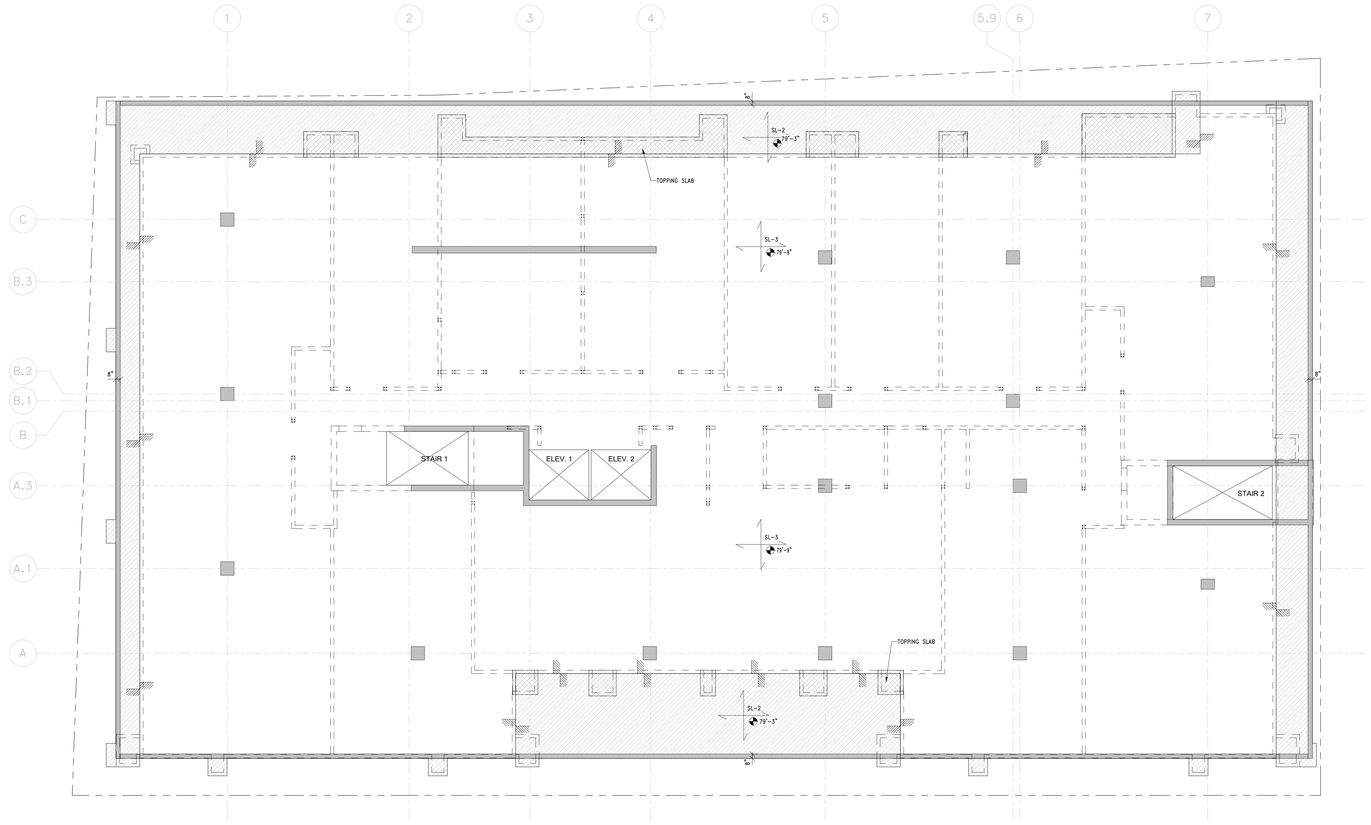
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SECOND FLOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:
1. VERIFY ALL ELEVATIONS AND DIMENSIONS SHOWN W/ARCHITECTURAL DRAWINGS.
2. TOP OF SLAB ELEVATION = SEE PLAN
3. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
4. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
5. VERIFY ALL COLUMN COORDINATES WITH ARCHITECTURAL DRAWINGS.
6. ALL ADDITIONAL TOP REINFORCEMENT TO BE CENTERED ON COLUMNS (TYPICAL).
7. BOTTOM OF BEAM IN SHEAR WALLS TO BE BASED ON R.O. DIMENSIONS, SEE ARCH. DWGS. AND TYPICAL DETAILS.
8. ALL BARS AT SLAB EDGES TO BE HOOKED.
9. STAIR ATTACHMENT TO BE COORDINATED W/APPROVED DWGS.
10. BOTTOM BARS WILL TERMINATE AT SLAB STEPS WHEN INTERFACED WITH SHALLOWER SLABS. TOP BARS TO CONTINUE FULL LENGTH PER PLAN.
11. ALL TOP BARS SHALL BE EPOXY COATED FOR ALL SLABS AND RAMPS IN PARKING AREAS AND EXPOSED TO WEATHER.
12. REFER TO TYPICAL DETAILS FOR ADDITIONAL SLAB REINFORCEMENT AT SHEAR COLUMN BASE.
13. ALL ADDITIONAL SLAB SHEAR REINF. AND ADDITONAL REINF. AT SHEAR WALL COLUMN BASE SHALL BE SHOWN IN SHOP DRAWINGS.
14. VERIFY SLOPES OF SLABS WITH ARCHITECTURAL DRAWINGS.

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR			TRANSVERSE TIES	
		TOP	BOTTOM	SIDE BARS	LEGS	SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

SLAB SCHEDULE

MARK	DESCRIPTION
SL-1	12" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-2	24" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #7@12" O.C. BOTTOM E.W.
SL-3	30" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-4	36" CONCRETE SLAB REINF. W/#5@12" O.C. TOP & #5@12" O.C. BOTTOM E.W.
SL-5	

FRAMING LEGEND

MARK	DESCRIPTION
	DENOTES SLAB REINFORCING DIRECTION, SEE SLAB SCHEDULE
	DENOTES METAL DECK BEARING DIRECTION
SL-#	DENOTES SLAB TYPE, SEE SCHEDULE
CB-#	DENOTES CONCRETE BEAM, SEE SCHEDULE
DB	INDICATES ON PLAN HSSBX4X3/8 ELEVATOR DIVIDER BEAM
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-
	CONCRETE COLUMN, SEE SCHEDULE
	DENOTES CONCRETE COLUMN ABOVE
	DENOTES RAMP UP/DOWN, SEE TYPICAL DETAILS
	DENOTES DROP IN SLAB, SEE TYPICAL DETAIL
	DENOTES CHANGE IN SLAB THICKNESS, SEE TYPICAL DETAIL
	ON PLAN INDICATES TOP OF SLAB ELEVATION. VERIFY ALL ELEVATIONS WITH ARCHITECTURAL DRAWINGS
	DENOTES WALL ABOVE
	DENOTES MOMENT CONNECTION, SEE TYPICAL DETAIL
SF	DENOTES STEP FOOTING

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PORT CHESTER, NEW YORK

SECOND FLOOR FRAMING PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

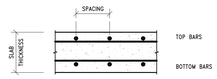
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DRAWN BY: FPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:41:54 PM
FILE NAME:

S-302

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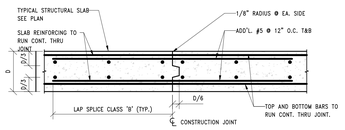
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TYPICAL SLAB REBAR LAYOUT

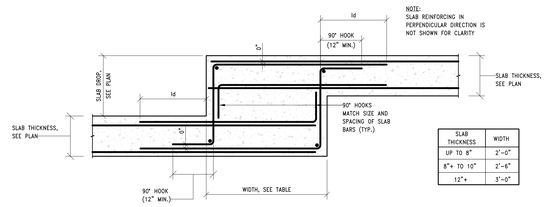
NOT TO SCALE



NOTE:
1. GC TO PROVIDE LOCATION OF CONSTRUCTION JOINT FOR OUR REVIEW PRIOR TO PLACING CONCRETE
2. PLACE CONSTRUCTION JOINTS @ 1/3 x CLEAR SPAN BETWEEN COLUMNS.

TYPICAL STRUCTURAL SLAB CONSTRUCTION JOINT DETAIL

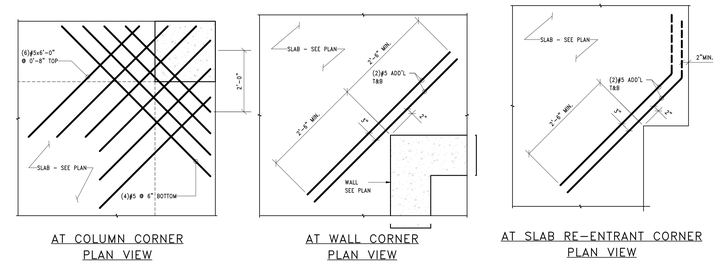
NOT TO SCALE



SLAB THICKNESS	WIDTH
UP TO 8"	2'-0"
8"+ TO 10"	2'-6"
12"+	3'-0"

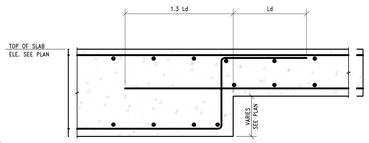
TYPICAL DROP IN STRUCTURAL SLAB DETAIL

NOT TO SCALE



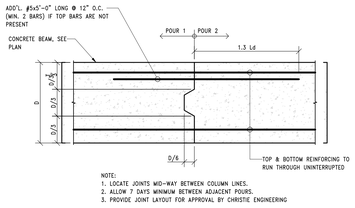
TYPICAL SLAB REINFORCEMENT @ CORNERS

NOT TO SCALE



TYPICAL CHANGE IN SLAB THICKNESS

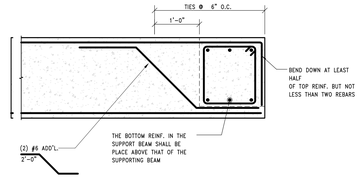
NOT TO SCALE



NOTE:
1. LOCATE JOINTS MID-WAY BETWEEN COLUMN LINES.
2. ALLOW 7 DAYS MINIMUM BETWEEN ADJACENT POURS.
3. PROVIDE JOINT LAYOUT FOR APPROVAL BY CHRISTIE ENGINEERING

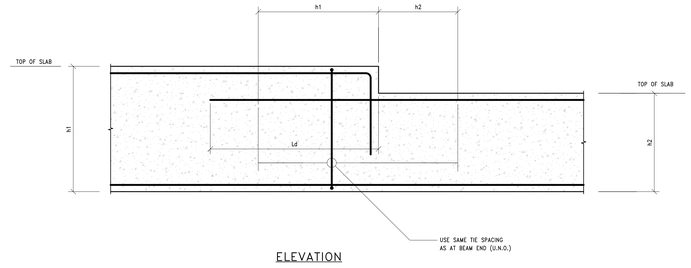
TYPICAL CONCRETE BEAM CONSTRUCTION JOINT

NOT TO SCALE



DETAIL FOR CANTILEVER SUPPORTING BEAM

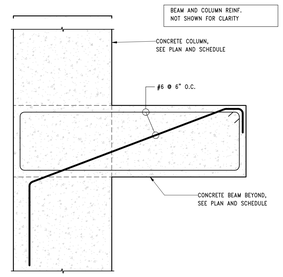
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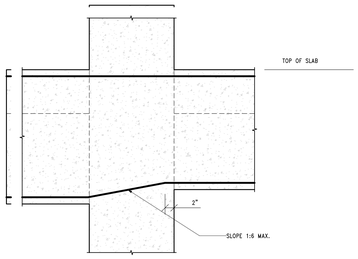
ELEVATION

STEPPING BEAM REINFORCEMENT DETAIL

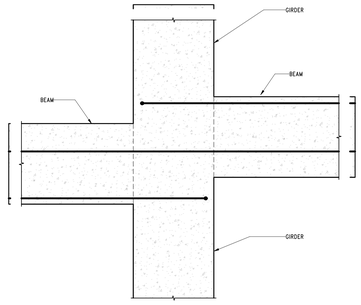
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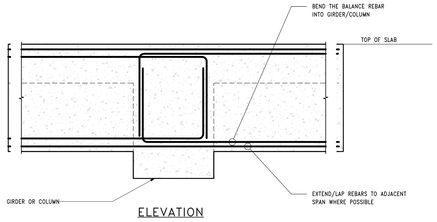
ELEVATION



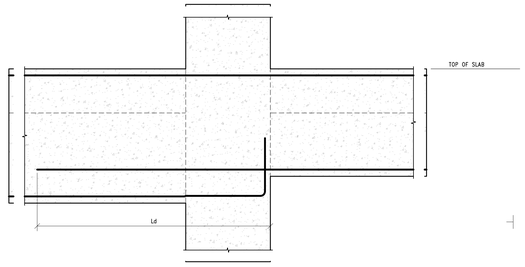
ELEVATION



PLAN VIEW



ELEVATION



ELEVATION

TYPICAL ADD'L REINFORCEMENT DETAIL WHERE BEAM OFFSET FROM COLUMN

NOT TO SCALE

DETAIL FOR BEAMS (BOTTOM NOT FLUSH) AT SUPPORT

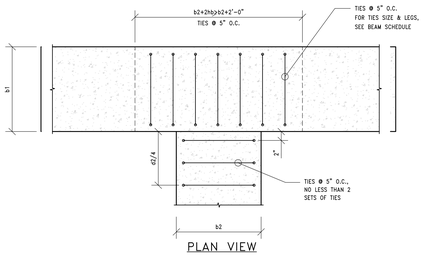
NOT TO SCALE

WITH DIFFERENT DETAIL FOR TWO ADJACENT BEAMS

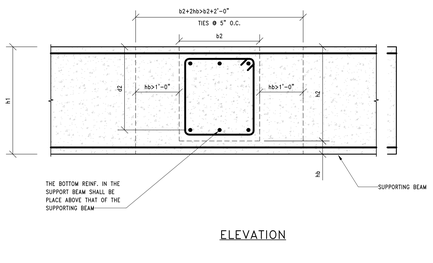
NOT TO SCALE

DETAIL FOR BEAMS (BOTTOM NOT FLUSH) AT SUPPORT

NOT TO SCALE



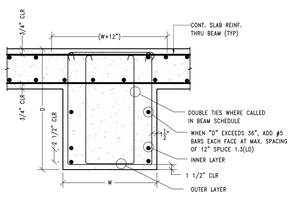
PLAN VIEW



ELEVATION

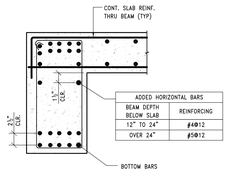
DETAIL FOR JOINTS BETWEEN BEAMS OF SIMILAR

NOT TO SCALE



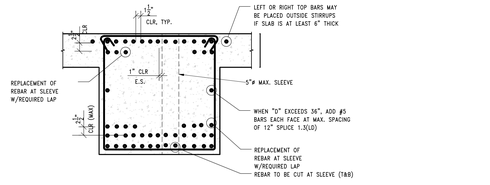
TYPICAL CONCRETE BEAM DETAIL

NOT TO SCALE



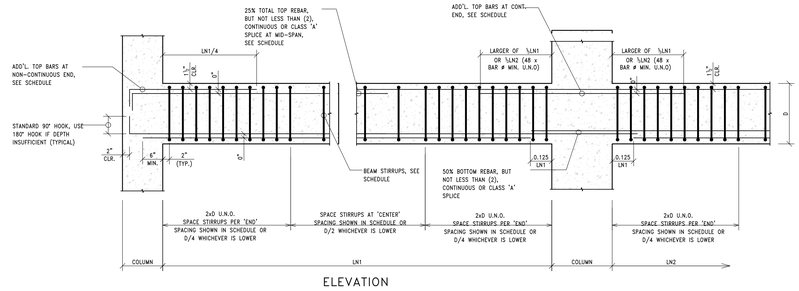
TYPICAL SPANDREL BEAM

NOT TO SCALE



TYPICAL CONCRETE BEAM W/ SLEEVE DETAIL

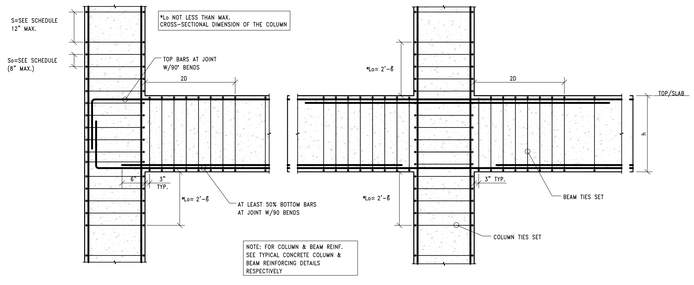
NOT TO SCALE



ELEVATION

TYPICAL CONCRETE BEAM REINFORCING DETAIL

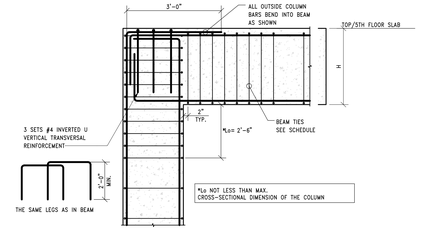
NOT TO SCALE



ELEVATION

BEAM-COLUMN JOINT REINFORCEMENT DETAIL

NOT TO SCALE



ELEVATION

BEAM-COLUMN JOINT AT DISCONTINUOUS OF COLUMN

NOT TO SCALE

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TYPICAL CONCRETE FRAMING DETAILS-1

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
DRAWN BY: PFS
CHECKED BY: KF
PLOT DATE: 1/31/2025 4:41:56 PM
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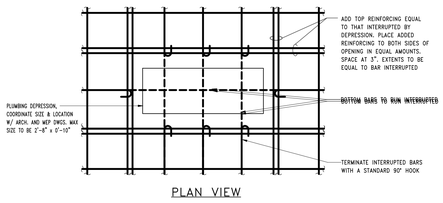
S-400

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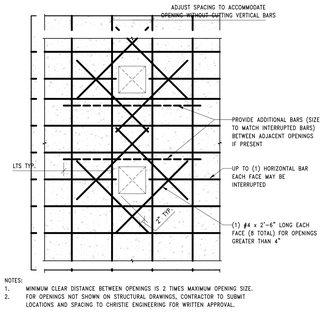
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PLAN VIEW

TYPICAL REINFORCING DETAIL AT PLUMBING DEPRESSIONS

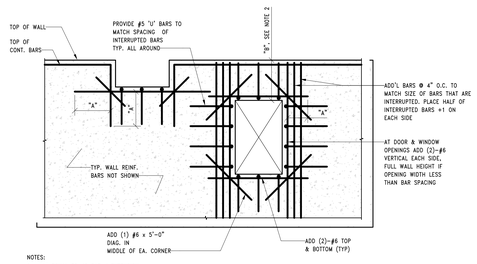
NOT TO SCALE



NOTES:
1. MINIMUM CLEAR DISTANCE BETWEEN OPENINGS IS 2 TIMES MAXIMUM OPENING SIZE.
2. FOR OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS, CONTRACTOR TO SUBMIT LOCATIONS AND SPACING TO CHRISTIE ENGINEERING FOR WRITTEN APPROVAL.

TYPICAL REINFORCING REQUIRED AT OPENINGS AND BREAKS IN CONCRETE WALLS LESS THAN 10"

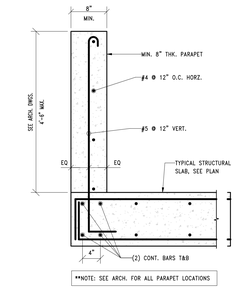
NOT TO SCALE



NOTES:
1. "A" EQUAL TO 40 BAR # EXTENSION.
2. MINIMUM DIMENSION "B" IS 1'-0" FROM TOP OF OPENING TO TOP OF WALL OR FROM BOTTOM OF OPENING TO TOP OF FOOTING PROVIDE #3 @ 6" O.C. TIES (U.N.O.) FOR 1'-0" LESS THAN OR EQUAL TO "B" AND LESS THAN 2'-6".

TYPICAL REINFORCING REQUIRED AT OPENINGS AND BREAKS IN CONCRETE WALLS

NOT TO SCALE



**NOTE: SEE ARCH. FOR ALL PARAPET LOCATIONS

TYPICAL CONCRETE PARAPET DETAIL

NOT TO SCALE

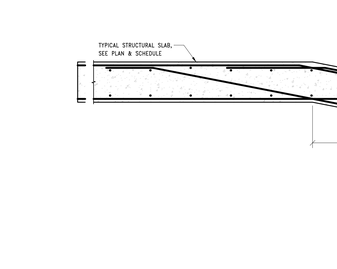
CURB WIDTH OVER 7"

CURB WIDTH 4" TO 7" MAX.

NOTE:
1. FOR CURB LOCATION, REFER TO ARCH DRAWINGS
2. ROUGHEN SURFACE OF SLAB TO 1/4" AMPLITUDE CLEAN THOROUGHLY AND APPLY BONDING AGENT IMMEDIATELY BEFORE CASTING CURB.
3. THIS DETAIL IS APPLICABLE AT CURBS FOR NON-STRUCTURAL ELEMENTS SUCH AS SKYLIGHTS, INTERIOR PARTITIONS AND INTERIOR RAILINGS.
4. FOR HEIGHT MORE THAN 1'-6" FOLLOW TYPICAL PARAPET DETAILS

TYPICAL CURB DETAIL (NOT SUBJECT TO LATERAL LOADS)

NOT TO SCALE

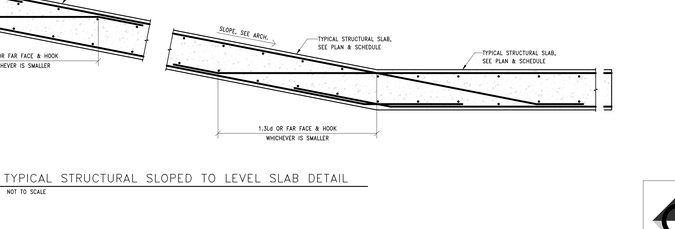


CURB WIDTH OVER 8"

NOTE:
1. FOR CURB LOCATION, REFER TO ARCH DRAWINGS

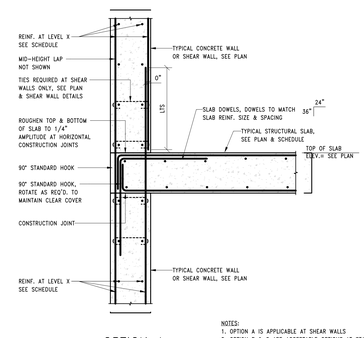
TYPICAL CURB DETAIL (SUBJECT TO LATERAL LOADS)

NOT TO SCALE

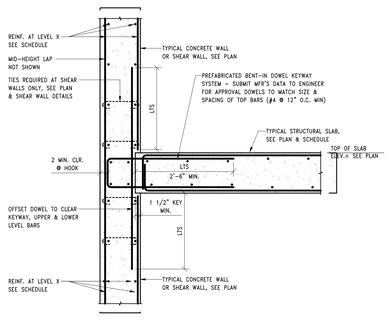


TYPICAL HOIST LEAVE OUT/PHASED CONSTRUCTION JOINT DETAIL

NOT TO SCALE

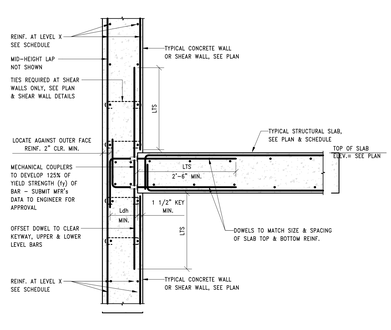


OPTION A



OPTION B

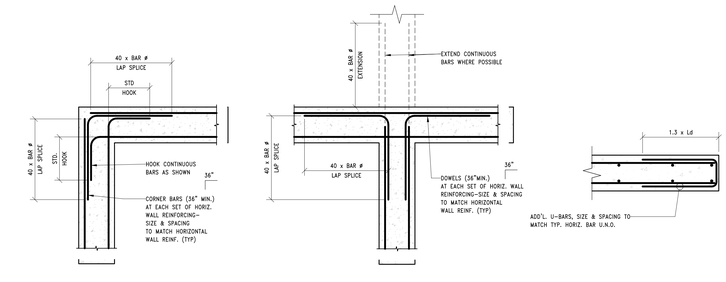
NOTES:
1. OPTION A IS APPLICABLE AT SHEAR WALLS
2. OPTION B & C ARE ACCEPTABLE OPTIONS AT STAIR LANDINGS



OPTION C

TYPICAL CONCRETE SLAB TO WALL DETAILS

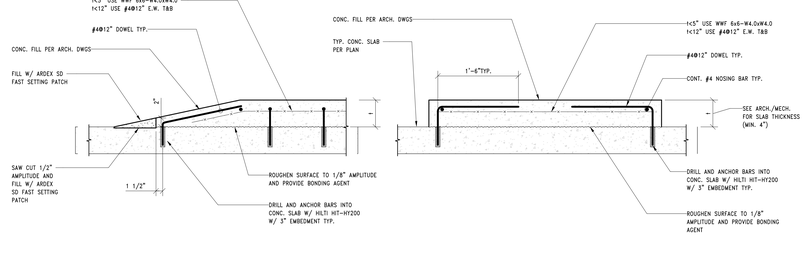
NOT TO SCALE



NOTE: USE THIS DETAIL @ ALL NON-SHEAR WALL LOCATIONS

TYPICAL CONCRETE WALL INTERSECTIONS

NOT TO SCALE



TYPICAL CONCRETE FILL @ HOUSEKEEPING PAD/MECH PAD/RAMP

NOT TO SCALE

TYPICAL STRUCTURAL SLOPED TO LEVEL SLAB DETAIL

NOT TO SCALE

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PORT CHESTER, NEW YORK

TYPICAL CONCRETE FRAMING DETAILS-2

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

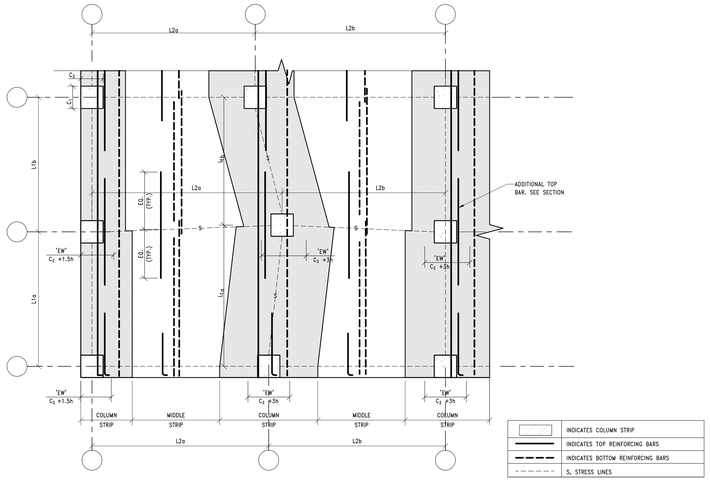
PROJECT No: CE#24-046
DRAWN BY: FPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:41:58 PM
FILE NAME:

S-401

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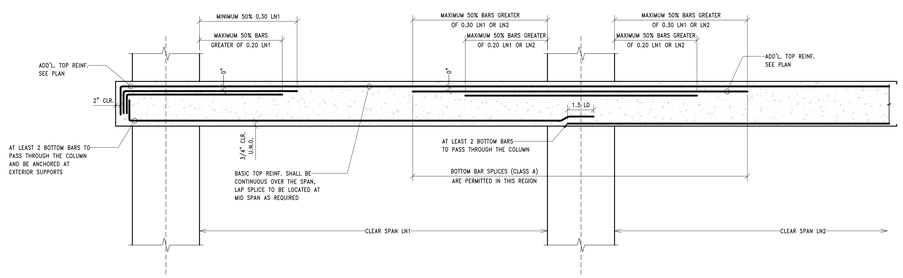


BAR PLACEMENT NOTES:

1. 'S' INDICATES ASSUMED DIRECTION OF LOAD IN DESIGN. 'S' LINES ARE OMITTED ON PLANS WHEN COLUMNS ALIGN ON A REGULAR GRID PATTERN AND THE S LINES COINCIDE WITH COMMON CENTER LINES.
2. BEAMS LOCATED IN FLAT SLAB AREAS SHALL BE CONSIDERED AS 'S' LINES FOR THE PURPOSE OF PLACEMENT OF PERPENDICULAR REINFORCEMENT.
3. THE DETAIL IS VALID FOR SLABS WITH OR WITHOUT DROP PANELS/SPANDREL BEAMS. DROP PANELS/SPANDREL BEAMS NOT SHOWN FOR CLARITY.
4. REINFORCEMENT SHOWN FOR ONE DIRECTION FOR CLARITY, TYPICAL BOTH DIRECTIONS.
5. ALL TOP BARS RUNNING PERPENDICULAR TO EDGE OF SLABS SHALL BE PLACED IN THE OUTERMOST LAYER.
6. TYPICAL REINFORCEMENT TO BE UNIFORMLY SPACED IN COLUMN AND MIDDLE STRIPS.
7. EFFECTIVE WIDTH 'EW'=C2+1.5h ON EACH SIDE OF THE COLUMN WHERE C2 = COLUMN DIMENSION PERPENDICULAR TO SPAN AND h = SLAB THICKNESS (INCLUDING DROP THICKNESS WHERE INDICATED)
8. WHEN ADDITIONAL BARS ARE SHOWN THUS (A+B) ON PLAN, PLACE 'A' BARS IN EFFECTIVE WIDTH AND SPACE 'B' BARS UNIFORMLY OVER BALANCE OF COLUMN STRIP WIDTH. PLACE ATLEAST 60% OF TOP BARS WITHIN THE EFFECTIVE WIDTH U.N.O.
9. IN CASE OF VARYING WIDTHS OF COLUMN STRIPS, PLACE ALL COLUMN STRIP TOP BARS WITHIN THE NARROWER COLUMN STRIP AND PLACE ALL MIDDLE STRIP TOP BARS UNIFORMLY IN BETWEEN.
10. AT LEAST 2 BOTTOM BARS IN COLUMN STRIP TO PASS THROUGH THE COLUMN AND BE ANCHORED AT EXTERIOR SUPPORTS.

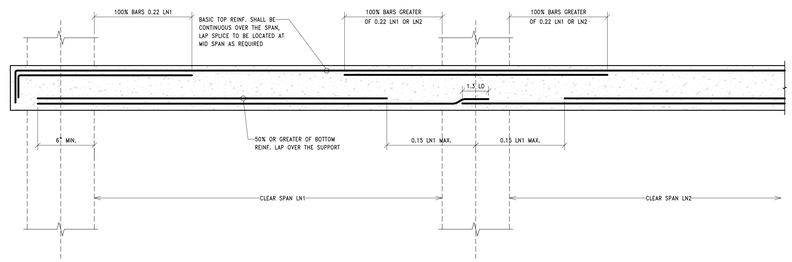
TYPICAL BAR PLACEMENT FOR FLAT SLAB CONSTRUCTION

NOT TO SCALE



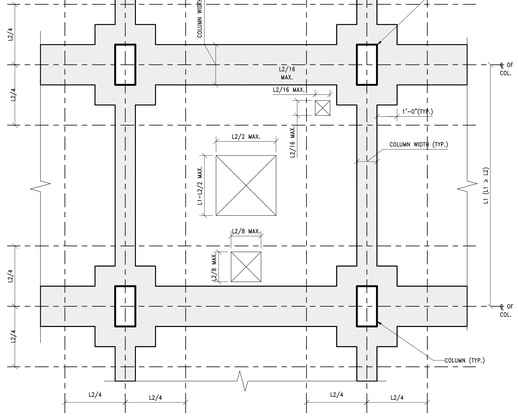
TYPICAL COLUMN STRIP FLAT SLAB SECTION

NOT TO SCALE



TYPICAL MIDDLE STRIP FLAT SLAB SECTION

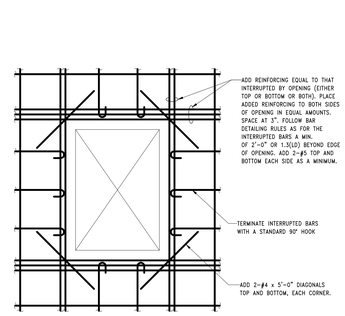
NOT TO SCALE



NOTES:
1. SHADED AREA INDICATES AREA IN WHICH OPENINGS ARE NOT PERMITTED UNLESS SPECIALLY DETAILED AND DESIGNED BY CHRISTIE ENGINEERING. CHRISTIE ENGINEERING SHALL BE NOTIFIED IF ANY OTHER CONTRACT DOCUMENTS SHOW OPENINGS IN SHADED AREA THAT ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
2. OPENINGS THAT ARE WITHIN THE DIMENSIONS AND CORRESPONDING LOCATIONS SHOWN ABOVE ARE PERMITTED AND SHALL BE REINFORCED IN ACCORDANCE WITH THE TYPICAL REINFORCING AT SLAB OPENING DETAIL. SUCH OPENINGS AND REINFORCEMENT SHALL BE INCLUDED IN REINFORCEMENT SHOP DRAWINGS.

TYPICAL ALLOWABLE OPENINGS IN CONCRETE SLABS

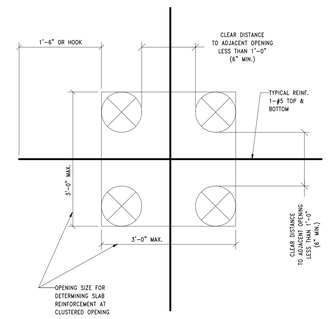
NOT TO SCALE



TYPE 1

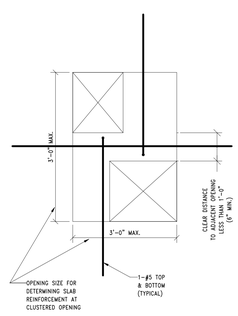
NOTE:
WHERE OPENING DIMENSION IS 1'-0" OR LESS, REINFORCE BARS MAY BE SHIFTED TO CELLAR OPENING SO THAT SLAB REINFORCING IS NOT INTERRUPTED. FOR SUCH A CASE THE ADDED BARS CAN BE REDUCED TO 1-#5 TOP AND BOTTOM EACH SIDE

ADDITIONAL TOP BARS	
OPENING SIZE (LARGER DIMENSION OF OPENING)	TOP BARS ALL SIDE
< 12"	NONE
12" - 36"	SEE TYPE 1



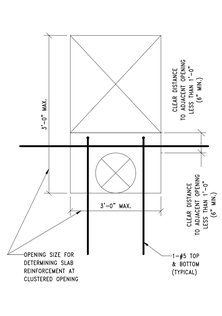
TYPE 2

NOTE:
SEE TYPE 1 FOR ADDITIONAL INFORMATION



TYPE 3

NOTE:
SEE TYPE 1 FOR ADDITIONAL INFORMATION



TYPE 4

NOTE:
SEE TYPE 1 FOR ADDITIONAL INFORMATION

ADDITIONAL REINFORCEMENT AT CLUSTERED OPENING

NOTE:
1. ADDITIONAL REINFORCEMENT AROUND OPENING ARE IN ADDITION TO THE TYPICAL SLAB REINFORCEMENT
2. WHEN CLUSTERED OPENING DOES NOT MEET SLAB OPENING LIMITATION OR IS GREATER THAN 3'-0", SUBMIT TO ENGINEER'S REVIEW AND APPROVAL

TYPICAL REINFORCING AT SLAB OPENINGS DETAIL

NOT TO SCALE

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TYPICAL CONCRETE FRAMING DETAILS-3

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
DRAWN BY: PPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:41:59 PM
FILE NAME:

S-402

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DEVELOPMENT LENGTH SCHEDULE (INCHES)

BAR SIZE	MIN. BAR SPACING (INCHES)	TENSION									COMPRESSION				
		NOTED Ld ON DWGS									NOTED Ldh ON DWGS				NOTED Ldc ON DWGS
		f'c (PSI)									f'c (PSI)				f'c (PSI)
		4000	5000	6000	7000	8000	9000	10000	11000	12000	4000	5000	6000	7000	TYPICAL
#3	1.375	15	13	12	12	12	12	12	12	12	7	7	6	6	6	8
#4	1.5	19	17	16	15	14	13	12	12	12	10	9	8	7	7	10
#5	1.625	24	22	20	18	17	16	15	15	15	12	11	10	9	9	12
#6	1.75	29	26	24	22	21	19	18	18	18	15	13	12	11	10	15
#7	1.875	42	38	34	32	30	28	27	27	27	17	15	14	13	12	17
#8	2	48	43	39	36	34	32	30	30	30	19	17	16	15	14	19
#9	2.256	54	48	44	41	38	36	34	34	34	22	19	18	16	15	22
#10	2.54	61	54	50	46	43	41	39	39	39	24	22	20	19	17	24
#11	2.82	67	60	55	51	48	45	43	43	43	27	24	22	21	19	27

TYPICAL LAP SPLICE LENGTH SCHEDULE (INCHES)

BAR SIZE	MIN. BAR SPACING (INCHES)		TENSION (LTS)					COMPRESSION (LCS)
	BEAMS & COLUMNS	ALL OTHERS	f'c = 4 KSI	f'c = 5 KSI	f'c = 6 KSI	f'c = 7 KSI	f'c = 8 KSI	
#4	1.5	1.5	25	22	20	19	18	15
#5	1.625	1.875	31	28	25	24	22	19
#6	1.75	2.25	37	33	31	28	26	23
#7	1.875	2.625	54	49	44	41	38	27
#8	2	3	62	55	51	47	44	30
#9	2.256	3.384	70	63	57	53	49	34
#10	2.54	3.810	79	70	64	59	56	38
#11	2.82	4.230	87	78	71	66	62	43

SLAB LAP SPLICE LENGTH SCHEDULE (INCHES)

BAR SIZE	MIN. BAR SPACING (INCHES)	TENSION(LTS)				
		f'c = 4 KSI	f'c = 5 KSI	f'c = 6 KSI	f'c = 7 KSI	f'c = 8 KSI
#7	3	60	54	49	45	42
#8	3	74	66	61	56	53
#9	3	90	80	73	68	64
#10	3	108	97	88	82	76
#11	3	127	113	103	96	90

NOTES: REFER TO TABLE ABOVE (TYPICAL LAP SPLICE LENGTH SCHEDULE) FOR SPLICE LENGTH REQUIRED FOR #6 BARS AND SMALLER.

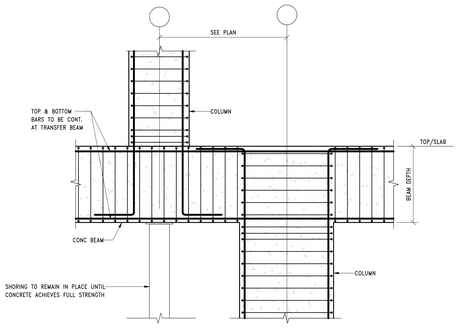
DEVELOPMENT LENGTH AND LAP SPLICE MODIFICATION FACTORS FOR EPOXY-COATED REINFORCEMENT

BARS WITH CLEAR COVER LESS THAN $3d_b$ OR CLEAR SPACING LESS THAN $6d_b$	TOP BARS	1.3
	OTHER BARS	1.5
ALL OTHER CONDITIONS		1.2

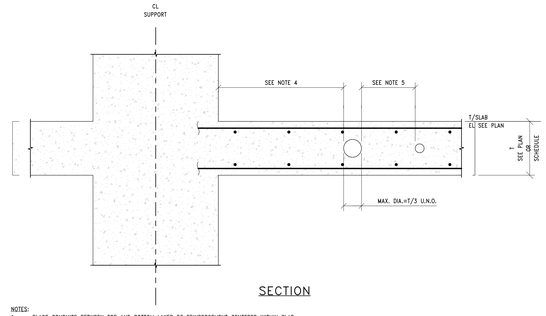
NOTE: THESE FACTORS ARE CUMULATIVE WITH ALL OTHER APPLICABLE FACTORS (SEE DEVELOPMENT AND LAP SPLICE NOTES 3 AND 5)

DEVELOPMENT LENGTH AND LAP SPLICE NOTES:

1. WHERE BARS OF DIFFERENT SIZES ARE LAP SPLICED IN TENSION, THE LAP LENGTH SHALL BE THE TENSION LAP SPLICE LENGTH (LTS) OF THE SMALLER BAR.
2. WHERE BARS OF DIFFERENT SIZES ARE LAP SPLICED IN COMPRESSION, THE COMPRESSION LAP LENGTH (LCS) SHALL BE THE LARGER OF THE COMPRESSION DEVELOPMENT LENGTH (Ldc) OF THE LARGER BAR OR THE COMPRESSION LAP SPLICE LENGTH OF THE SMALLER BAR.
3. TABULATED VALUES ARE FOR OTHER BARS. FOR TOP BARS MULTIPLY BY 1.3. "TOP BARS" ARE DEFINED PER ACI AS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE . "OTHER BARS ARE ALL BARS FOR WHICH THIS DOES NOT APPLY". ALL WALL HORIZONTAL REINFORCING ARE "TOP BARS".
4. TABULATED VALUES ARE FOR NON-EPOXY COATED REINFORCEMENT. FOR EPOXY COATED REINFORCEMENT MULTIPLY VALUES BY THE APPROPRIATE FACTOR LISTED IN THE DEVELOPMENT LENGTH AND LAP SPLICE MODIFICATION FACTORS FOR EPOXY-COATED REINFORCEMENT TABLE.
5. TABULATED VALUES ARE FOR NORMAL WEIGHT CONCRETE. FOR LIGHT WEIGHT CONCRETE, MULTIPLY BY 1.33
6. TABULATED VALUES ARE CLASS B. CLASS A SPLICES MUST BE APPROVED BY EOR.
7. TABULATED VALUES ARE FOR REINFORCING WITH A MINIMUM YIELD STRENGTH OF 60,000PSI.
8. FOR SLAB BARS #6 AND SMALLER, SEE TYPICAL LAP SPLICE LENGTH SCHEDULE.



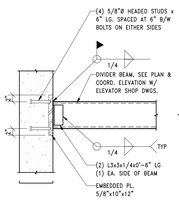
TYPICAL COLUMN TRANSFER ON BEAM DETAIL
NOT TO SCALE



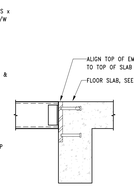
SECTION

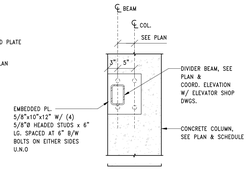
NOTES:
1. PLACE CONDUITS BETWEEN TOP AND BOTTOM LAYER OF REINFORCEMENT CENTERED WITHIN SLAB.
2. CROSSOVER OF CONDUITS AND/OR PIPES IS NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY E.R.
3. CONDUITS TO BE PLASTIC OR STEEL. USE OF ALUMINUM CONDUITS IS NOT PERMITTED.
4. PLACE CONDUITS THE LARGEST OF THE FOLLOWING CLEAR FROM FACE OF COLUMN:
   A. LARGEST COLUMN DIMENSION (WIDTH OR DEPTH)
   B. 2 x SLAB THICKNESS, T
   C. 1'-0"
5. MAINTAIN A CLEAR SPACING BETWEEN CONDUITS OF THREE TIMES THE LARGER OUTER DIAMETER OF D1 AND D2, BUT NOT LESS THAN 6" MIN.
6. NO MORE THAN THREE (3) CONDUITS PER SIX (6) FT WIDTH OF SLAB ARE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY E.R.
7. WHERE LARGE NUMBERS OF CONDUIT ENTER THE SLAB AT ONE LOCATION:
   A. SUBMIT LAYOUT FOR APPROVAL BY S.E.R.
   B. FAN OUT CONDUITS IMMEDIATELY
   C. PROVIDE ADDITIONAL TOP & BOTTOM REINFORCEMENT AS DIRECTED BY S.E.R. UNTIL NOTES 5 AND 6 SPACING REQUIREMENTS ARE MET.
8. NO CONDUITS ARE PERMITTED WITHIN A DISTANCE "T" CLEAR FROM SLAB EDGE, SLAB DEPRESSION, OR DROP PANEL WITHOUT WRITTEN APPROVAL BY E.R.
9. ANY DEVIATIONS FROM THE ABOVE STATED CONDITIONS REQUIRE WRITTEN APPROVAL BY E.R.

TYPICAL CONDUITS IN SLAB
NOT TO SCALE

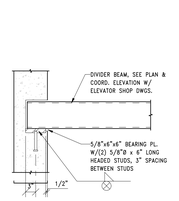


DIVIDER BEAM

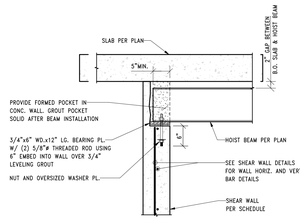




DIVIDER BEAM @ COL #76

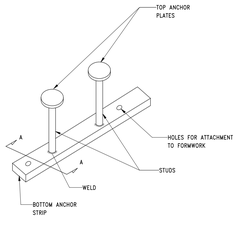


DIVIDER BEAM ALTERNATE DETAIL @ WALL

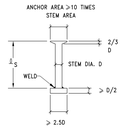


HOIST BEAM TO CONC. WALL SECTION

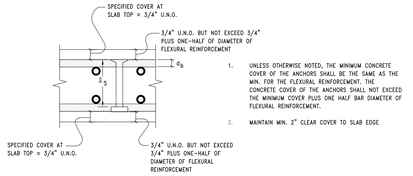
TYPICAL ELEVATOR DIVIDER AND HOIST BEAM DETAILS
NOT TO SCALE



SHEAR STUD DETAIL

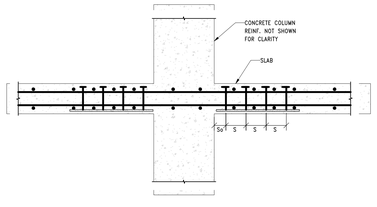


SECTION A–A

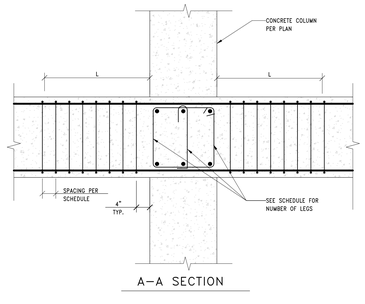


1. UNLESS OTHERWISE NOTED, THE MINIMUM CONCRETE COVER OF THE ANCHORS SHALL BE THE SAME AS THE MIN. FOR THE FLEXURAL REINFORCEMENT. THE CONCRETE COVER OF THE ANCHORS SHALL NOT EXCEED THE MINIMUM COVER PLUS ONE HALF BAR DIAMETER OF FLEXURAL REINFORCEMENT.
2. MAINTAIN MIN. 2" CLEAR COVER TO SLAB EDGE

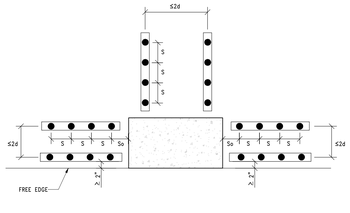
TYPICAL SECTION IN SLAB PERPENDICULAR TO SHEAR STUD LINE



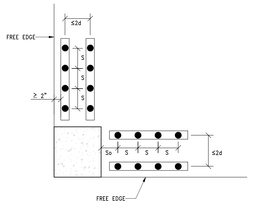
TYPICAL SECTION IN SLAB PARALLEL TO SHEAR STUD LINE



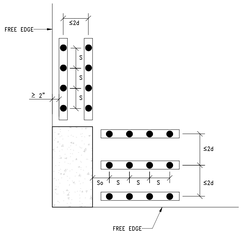
A–A SECTION



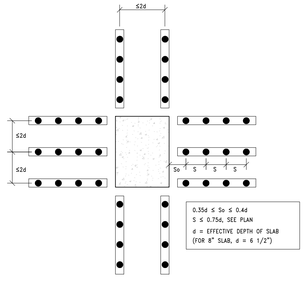
TYPE A – EDGE COLUMN (6 RAILS)



TYPE B – CORNER COLUMN (4 RAILS)



TYPE C – CORNER COLUMN (5 RAILS)



TYPE D – INTERIOR COLUMN (10 RAILS)

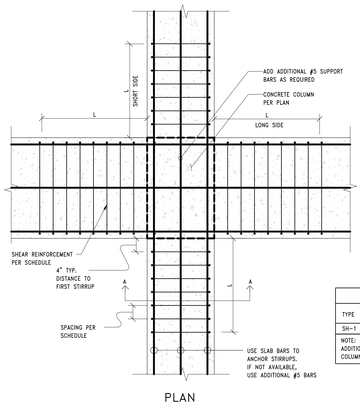
INSTALLATION OF SHEAR STUD ASSEMBLIES

1. PLACE ASSEMBLIES PERPENDICULAR TO EACH COLUMN FACE
2. MAINTAIN MINIMUM 2" CLEAR COVER TO SLABEDGE.
3. ALIGN BOTTOM ANCHOR STRIPS WITH FINISHED COLUMN FACES.
4. EQUALLY SPACE ASSEMBLIES WHEN TWO OR MORE ARE REQUIRED ON A SINGLE COLUMN FACE.
5. ASSEMBLY MUST BE PLACED AND REMAIN VERTICAL IN THE SLAB.
6. ENSURE THAT THE MAXIMUM/MINIMUM COVERS TO THE TOP SHEAR HEAD AND THE BOTTOM STRIP ARE MAINTAINED.
7. FIX ASSEMBLY TO FRAMEWORK TO PREVENT MOVEMENT DURING CONCRETE POURING

TOLERANCES:

1. TOLERANCES FOR So, S SHOULD NOT EXCEED ±0.5 IN.
2. TOLERANCES FOR THE DISTANCES BETWEEN COLUMN FACE AND OUTERMOST PERIPHERAL LINE OF STUDS SHOULD NOT EXCEED ± 1.5 IN.

TYPICAL ARRANGEMENT OF SHEAR STUDS
NOT TO SCALE



PLAN

SHEAR REINFORCEMENT SCHEDULE			
TYPE	L	STIRRUPS	
		LONG SIDE	SHORT SIDE
SH-1	6'-0"	#4, 6, @ 4"O.C.	#4, 4, @ 4"O.C.

NOTE:
ADDITIONAL SHEAR REINFORCEMENT IS NOT REQUIRED AT THE SIDE OF COLUMN THAT HAS A BEAM FRAMING INTO IT.

TYPICAL SLAB SHEAR REINFORCEMENT
NOT TO SCALE

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PORT CHESTER, NEW YORK

TYPICAL CONCRETE FRAMING DETAILS-5

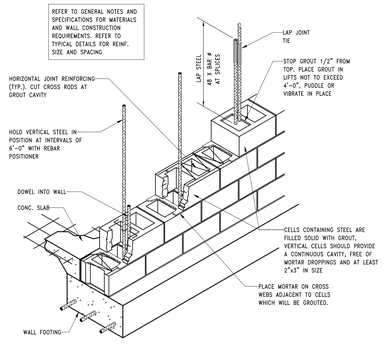
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PROJECT No: CE#24-046
DRAWN BY: FPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:42:01 PM
FILE NAME:

S-403

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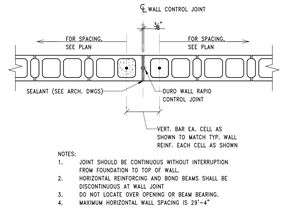


TYPICAL REINFORCED CONCRETE MASONRY CONSTRUCTION

NOT TO SCALE

CMU LAP SPLICE LENGTH SCHEDULE (INCHES)

WALL COMPRESSIVE STRENGTH, f'm		1.5 KSI			2 KSI			2.5 KSI			3 KSI		
WALL THICKNESS, t		8"	10"	12"	8"	10"	12"	8"	10"	12"	8"	10"	12"
BAR SIZE	#4	20	20	20	17	17	17	16	16	16	14	14	14
	#5	25	25	25	22	22	22	20	20	20	18	18	18
	#6	43	41	39	37	36	34	33	32	30	30	29	28
	#7	59	54	46	51	46	40	46	41	35	42	38	32
	#8	91	75	60	79	66	52	71	62	47	64	55	43



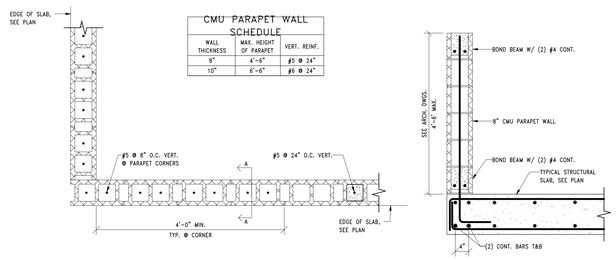
NOTES:
1. JOINT SHOULD BE CONTINUOUS WITHOUT INTERRUPTION FROM FOUNDATION TO TOP OF WALL.
2. HORIZONTAL REINFORCING AND BOND BEAMS SHALL BE DISCONTINUOUS AT WALL JOINT
3. DO NOT LOCATE OVER OPENING OR BEAM BEARING.
4. MAXIMUM HORIZONTAL WALL SPACING IS 29'-4"

TYPICAL CMU CONTROL JOINT DETAIL

SCALE: 3/4" = 1'-0"

CMU PARAPET WALL SCHEDULE

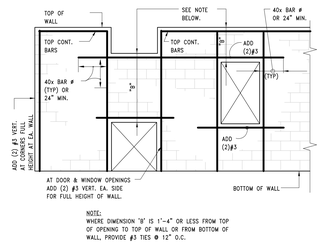
WALL THICKNESS	MAX. HEIGHT OF PARAPET	VERT. REINF.
8"	4'-6"	#5 @ 24"
10"	6'-6"	#6 @ 24"



**NOTE: SEE ARCH. FOR ALL PARAPET LOCATIONS

TYPICAL CMU PARAPET DETAIL

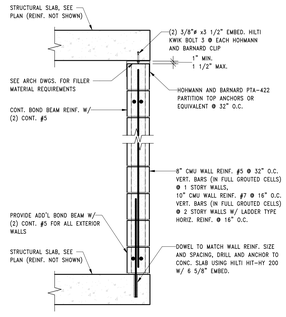
NOT TO SCALE



NOTE:
WHERE DIMENSION 'B' IS 1'-4" OR LESS FROM TOP OF OPENING TO TOP OF WALL OR FROM BOTTOM OF WALL, PROVIDE #3 TIES @ 12" O.C.

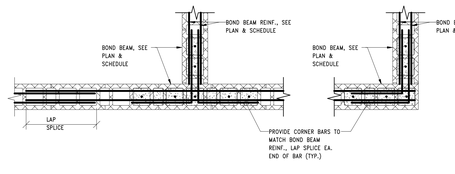
TYPICAL REINFORCING REQUIRED AT OPENINGS AND BREAKS IN MASONRY WALLS

NOT TO SCALE



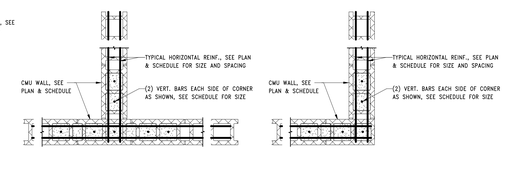
TYPICAL CMU PARTITION TO STRUCTURAL SLAB

NOT TO SCALE



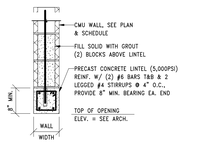
TYPICAL DETAIL AT BOND BEAM CORNERS AND INTERSECTIONS

NOT TO SCALE



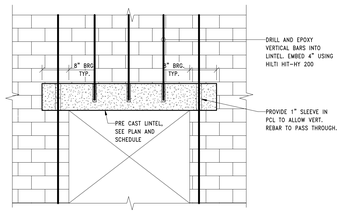
TYPICAL DETAIL AT CMU CORNERS AND INTERSECTIONS

NOT TO SCALE



TYPICAL PRECAST LINTEL DETAIL

NOT TO SCALE



TYPICAL PRECAST LINTEL ELEVATION

NOT TO SCALE

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Summit, NJ 07901

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PORT CHESTER, NEW YORK

TYPICAL MASONRY DETAILS

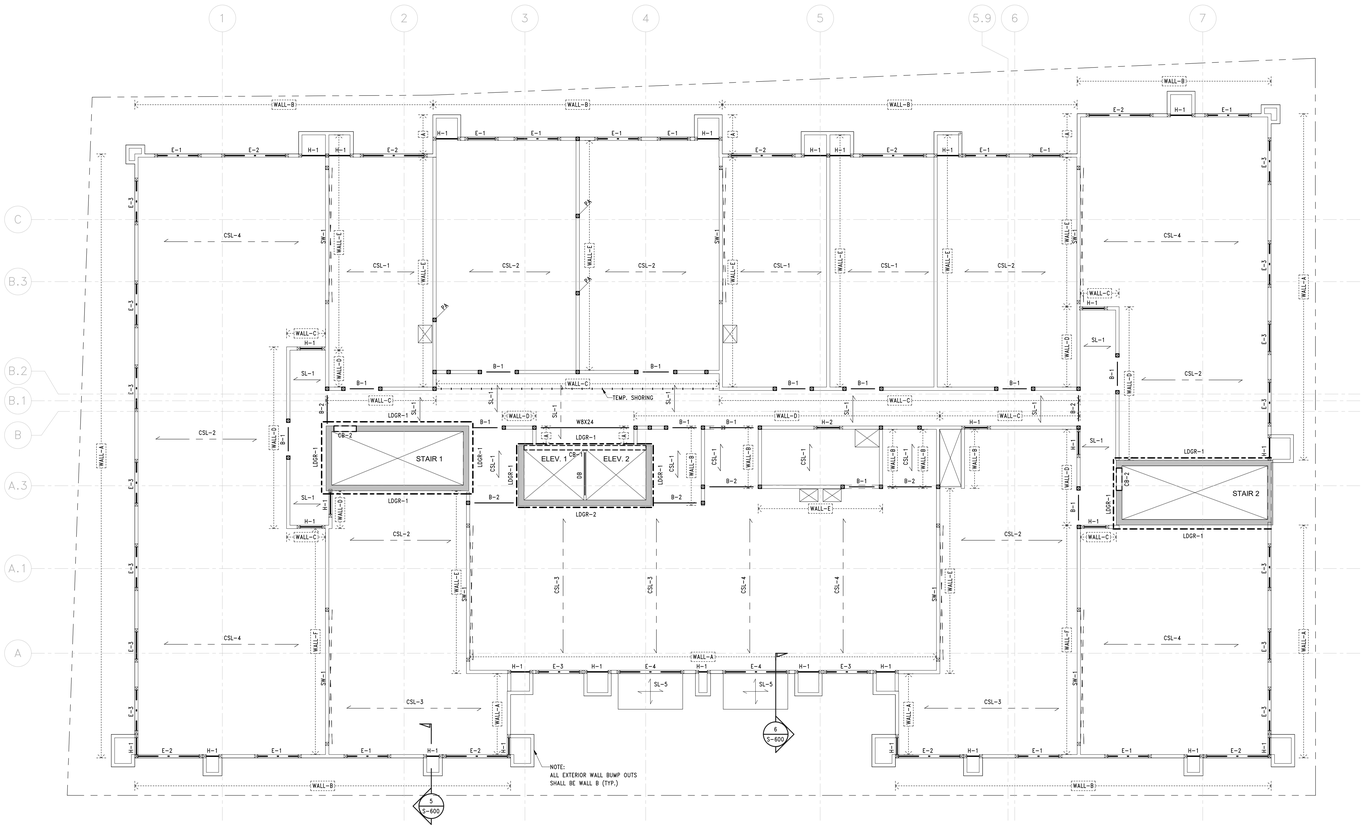
NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
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PLOT DATE: 1/31/2025 4:42:02 PM
FILE NAME:

S-404

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3RD THRU 9TH FLOOR FRAMING PLANS

SCALE: 1/8" = 1'-0"

NOTES:
1. TOP OF SLAB ELEVATION = U.N.O. ON PLAN
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS, ELEVATIONS AND FLOOR/WINDOW OPENINGS
3. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
4. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
5. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH.
6. SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
7. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH. SHORING LINES SHALL BE LOCATED A MAXIMUM OF 1'-0" FROM BEARING END OF DECK AND AS REQUIRED TO MEET UNSHORED SPAN LIMITS.SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
8. CONTRACTOR TO SHORE COWSLAB DECK DURING CONCRETE POUR PER MFR. RECOMMENDATIONS.
9. SEE SHEET S-700 FOR ADDITIONAL REINFORCEMENT AT SHEAR WALL POST LOCATIONS.

METAL STUD WALL FRAMING SCHEDULE

MARK	3rd FLOOR	4th FLOOR	5th FLOOR	6th FLOOR	7th FLOOR	8th FLOOR	9th FLOOR	ROOF	PENTHOUSE
WALL A	(2) 600S250-97	(2) 600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S200-54	600S162-54
WALL B	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	600S162-54	600S162-54	
WALL C	600S200-97	600S200-97	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	
WALL D	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S162-54	
WALL E	(2) 600S250-97	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-68	600S200-54	
WALL F	(2) 600S350-97	(2) 600S300-97	(2) 600S250-97	(2) 600S250-97	600S350-97	600S300-97	600S200-97	600S200-68	

NOTES:
1. ALL STUDS ARE SPACED AT 16" O.C., UNLESS NOTED OTHERWISE. DOUBLED UP STUDS, NOTED IN SCHEDULE (2), SHALL BE 'I' SHAPED.
2. ALL WALL STUDS SHALL HAVE CHANNEL BRIDGING (CRC-112-16) SET STUD PUNCHOUTS AND ATTACHED IN ACCORDANCE WITH BRIDGING DETAIL SPACED AT 48" O.C. MAX.
3. FOR CONNECTION DETAILS, REFER TO TYPICAL LIGHT GAGE DETAILS.
4. WALL PANELS ARE TO HAVE CONTINUOUS TOP AND BOTTOM HORIZONTAL STANDARD TRACKS WITH 1 1/4" FLANGES AND A DEPTH MATCHING THE DEPTH OF THE PANEL WALL STUDS. USING THE FOLLOWING MINIMUM GAGES BASED ON THE GAGE OF THE TYPICAL WALL PANEL STUDS:
   18 GAGE TO 16 GAGE STUDS: 16 GAGE TRACK
   10 GAGE TO 14 GAGE STUDS: 14 GAGE TRACK

METAL STUD WALL OPENING SCHEDULE

MARK	3RD FLR.	4TH FLR.	5TH FLR.	6TH FLR.	7TH FLR.	8TH FLR.	9TH FLR.	ROOF	PENTHOUSE
E-1	(2) 600S200-97	(2) 600S200-68	(2) 600S200-68	(2) 600S200-54	(2) 600S200-68	(2) 600S162-54	(2) 600S162-54	(2) 600S200-54	
E-2	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 @ 2X5	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54 (2) 600S162-97 @ 2X5	
E-3	HSS6x6x5/16*	HSS6x6x3/16*	(3) 600S200-97 HSS6x6x3/16* @ 2X5	(3) 600S200-97	(2) 600S250-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 @ 2X5	(2) 600S200-54 (2) 600S200-68 @ 2X5	
E-4	HSS6x6x5/16**	HSS6x6x1/4**	HSS6x6x1/4**	HSS6x6x3/16*	HSS6x6x3/16*	(3) 600S200-97	(2) 600S200-97	(2) 600S200-68	
H-1	(2) 600S20068	(2) 600S20068	(2) 600S20068	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	
H-2	(3) 600S200-97	(2) 600S250-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	

* INDICATES HSS POST REQUIRING 1/2" THICK BEARING PLATES, TOP AND BOTTOM. HSS6x6 = PL6x6 1/2.
** INDICATES HSS THRU POST, SEE TYPICAL DETAILS.

STEEL BEAM SCHEDULE

MARK	SIZE	JAMB POST
B-1	HSS8x3x1/4 "ON FLAT"	
B-2		

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR TOP	LONGITUDINAL REBAR BOTTOM	LONGITUDINAL REBAR SIDE BARS	TRANSVERSE TIES LEGS	TRANSVERSE TIES SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

POST SCHEDULE

TYPE	POST SIZE
PA	HSS6x6x3/16

FRAMING LEGEND

MARK	DESCRIPTION
CS-1	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #3 BARS @ EA. RIB
CS-2	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #3 BARS @ EA. RIB
CS-3	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #7 BARS @ EA. RIB
CS-4	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #8 BARS @ EA. RIB
SL-1	4 1/2" NORMAL WEIGHT CONCRETE OVER 1 1/2" VLI 18 GA. WETAL DECK (6" TOTAL THICKNESS) REINFORCED WITH W.W.F.6X6-W2.9XW2.9
SL-5	10.5" NORMAL WEIGHT CONCRETE SLAB REINFORCED WITH #4@12" O.C. TOP & BOTTOM EACH WAY
SW-#	DENOTES LIGHT GAGE SHEAR WALL, SEE ELEVATION & DETAILS ON S-700
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-202
	DENOTES OPENING IN FLOOR, SEE ARCH./MECH. FOR SIZES & LOCATIONS
H-#/E-#	DENOTES OPENING IN WALL, SEE WALL OPENING SCHEDULE AND WALL SECTIONS
CB-# / WALL-#-2	INTEGRAL CONCRETE BEAM POURED MONOLITHICAL WITH COWSLAB FLOOR SYSTEM. SEE SCHEDULE AND SECTIONS
WALL-#-2	DENOTES METAL STUD WALL, SEE WALL FRAMING SCHEDULE
	DEPICTS LIGHTGAGE JAMB POST IN WALL, ALL JAMB POST ARE BUILT UP 3 STUD (TYP. U.N.O) SEE TYPICAL LIGHTGAGE DETAILS
DB	HSS8X4X3/8 DIVIDER BEAM, COORDINATE W/ APPROVED ELEVATOR SHOP DRAWINGS FOR REQUIRED SIZE.
BR-#	DENOTES STRUCTURAL STEEL BRACE, SEE ELEVATION & DETAILS ON S-700
LDGR-1 / LDGR-2	DENOTES CONTINUOUS LEDGER: LDGR-1 = CONT. L6X4X5/16" (LLV) LDGR-2 = CONT. L7X4X1/2 (LLV). SEE ATTACHMENT DETAILS.

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PORT CHESTER, NEW YORK

3RD THRU 9TH FLOOR FRAMING PLANS

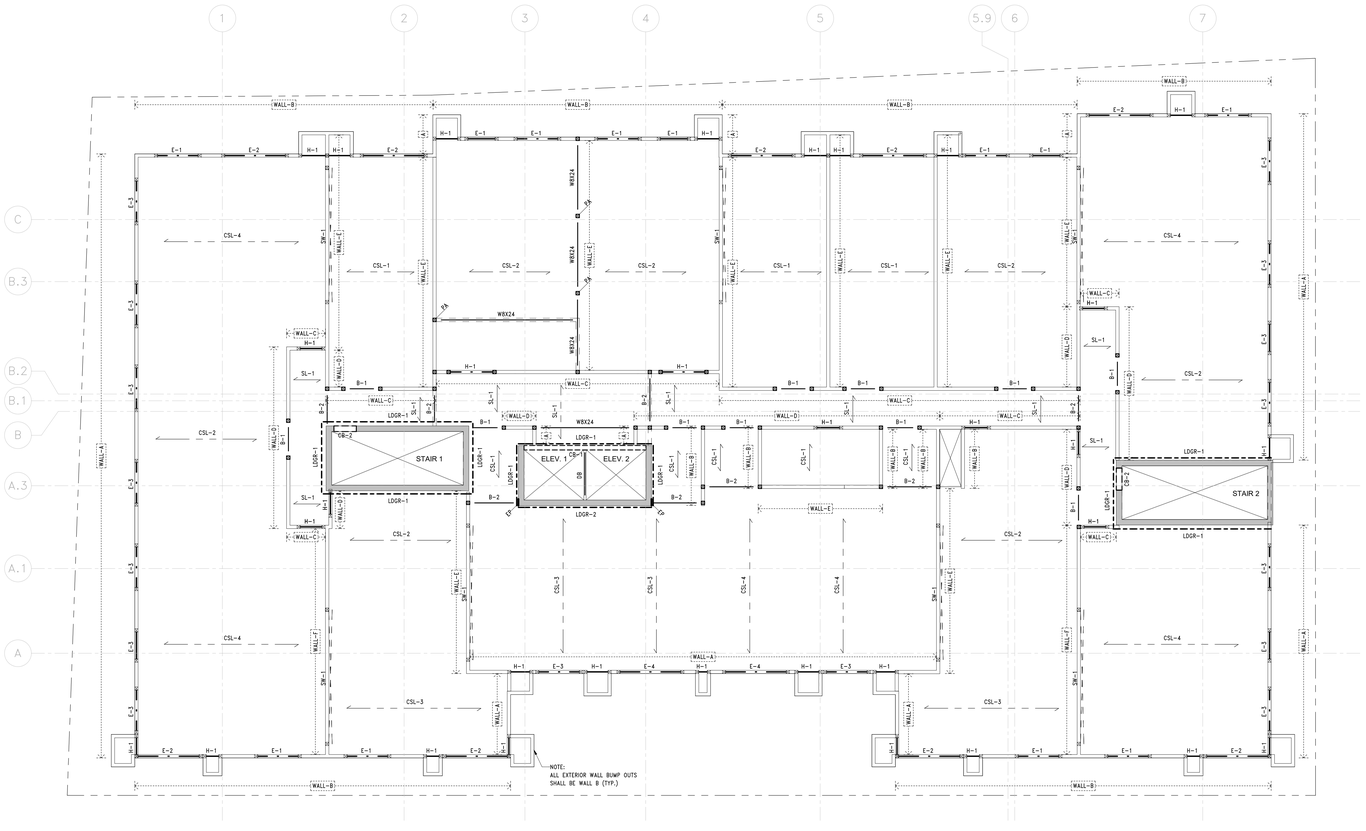
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PROJECT No: CE#24-046
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S-500

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ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:
1. TOP OF SLAB ELEVATION = U.N.O. ON PLAN
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS, ELEVATIONS AND
3. FLOOR/WINDOW OPENINGS
4. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
5. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
6. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH.
7. SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
8. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH. SHORING LINES SHALL BE LOCATED A MAXIMUM OF 1'-0" FROM BEARING END OF DECK AND AS REQUIRED TO MEET UNSHORED SPAN LIMITS.SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
9. CONTRACTOR TO SHORE COWSLAB DECK DURING CONCRETE POUR PER MFR. RECOMMENDATIONS.
10. SEE SHEET S-700 FOR ADDITIONAL REINFORCEMEWNT AT SHEAR WALL POST LOCATIONS.

METAL STUD WALL FRAMING SCHEDULE

MARK	3rd FLOOR	4th FLOOR	5th FLOOR	6th FLOOR	7th FLOOR	8th FLOOR	9th FLOOR	ROOF	PENTHOUSE
WALL A	(2) 600S250-97	(2) 600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S200-54	600S162-54
WALL B	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	600S162-54	600S162-54	
WALL C	600S200-97	600S200-97	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	
WALL D	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S162-54	
WALL E	(2) 600S250-97	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-68	600S200-54	
WALL F	(2) 600S350-97	(2) 600S300-97	(2) 600S250-97	(2) 600S250-97	600S350-97	600S300-97	600S200-97	600S200-68	

NOTES:
1. ALL STUDS ARE SPACED AT 16" O.C., UNLESS NOTED OTHERWISE. DOUBLED UP STUDS, NOTED IN SCHEDULE (2), SHALL BE 'I' SHAPED.
2. ALL WALL STUDS SHALL HAVE CHANNEL BRIDGING (CRC-112-16) SET STUD PUNCHOUTS AND ATTACHED IN ACCORDANCE WITH BRIDGING DETAIL SPACED AT 48" O.C. MAX.
3. FOR CONNECTION DETAILS, REFER TO TYPICAL LIGHT GAGE DETAILS.
4. WALL PANELS ARE TO HAVE CONTINUOUS TOP AND BOTTOM HORIZONTAL STANDARD TRACKS WITH 1 1/4" FLANGES AND A DEPTH MATCHING THE DEPTH OF THE PANEL WALL STUDS. USING THE FOLLOWING MINIMUM GAGES BASED ON THE GAGE OF THE TYPICAL WALL PANEL STUDS:
   18 GAGE TO 16 GAGE STUDS: 16 GAGE TRACK
   10 GAGE TO 14 GAGE STUDS: 14 GAGE TRACK

METAL STUD WALL OPENING SCHEDULE

MARK	3RD FLR.	4TH FLR.	5TH FLR.	6TH FLR.	7TH FLR.	8TH FLR.	9TH FLR.	ROOF	PENTHOUSE
E-1	(2) 600S200-97	(2) 600S200-68	(2) 600S200-68	(2) 600S200-54	(2) 600S200-68	(2) 600S162-54	(2) 600S162-54	(2) 600S200-54	
E-2	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 Ø 2IN.S	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54 (2) 600S162-97 Ø 2IN.S	
E-3	HSS6x6x3/16*	HSS6x6x3/16*	(3) 600S200-97 HSS6x6x3/16* Ø 2IN.S	(3) 600S200-97	(2) 600S250-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 Ø 2IN.S	(2) 600S200-54 (2) 600S200-68 Ø 2IN.S	
E-4	HSS6x6x5/16**	HSS6x6x1/4**	HSS6x6x1/4**	HSS6x6x3/16*	HSS6x6x5/16*	(3) 600S200-97	(2) 600S200-97	(2) 600S200-68	
H-1	(2) 600S20068	(2) 600S20068	(2) 600S20068	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	
H-2	(3) 600S200-97	(2) 600S250-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	

* INDICATES HSS POST REQUIRING 1/2" THICK BEARING PLATES, TOP AND BOTTOM. HSS6x6 = PL6x6 1/2.
** INDICATES HSS THRU POST, SEE TYPICAL DETAILS.

STEEL BEAM SCHEDULE

MARK	SIZE	JAMB POST
B-1	HSS8x3x1/4 "ON FLAT"	
B-2		

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR TOP	LONGITUDINAL REBAR BOTTOM	LONGITUDINAL REBAR SIDE BARS	TRANSVERSE TIES LEGS	TRANSVERSE TIES SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

POST SCHEDULE

TYPE	POST SIZE
PA	HSS6x6x5/16

FRAMING LEGEND

MARK	DESCRIPTION
CS-1	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #3 BARS @ EA. RIB
CS-2	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #5 BARS @ EA. RIB
CS-3	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #7 BARS @ EA. RIB
CS-4	COWSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #8 BARS @ EA. RIB
SL-1	4 1/2" NORMAL WEIGHT CONCRETE OVER 1 1/2" VLI 18 GA. WETAL DECK (6" TOTAL THICKNESS) REINFORCED WITH W.W.F.6X6-W2.9XW2.9
SL-5	10.5" NORMAL WEIGHT CONCRETE SLAB REINFORCED WITH #40@12" O.C. TOP & BOTTOM EACH WAY
SW-#	DENOTES LIGHT GAGE SHEAR WALL, SEE ELEVATION & DETAILS ON S-700
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-202
	DENOTES OPENING IN FLOOR, SEE ARCH./MECH. FOR SIZES & LOCATIONS
H-#/E-#	DENOTES OPENING IN WALL, SEE WALL OPENING SCHEDULE AND WALL SECTIONS
ICB-# WALL-#/-1	INTEGRAL CONCRETE BEAM POURED MONOLITHICAL WITH COWSLAB FLOOR SYSTEM. SEE SCHEDULE AND SECTIONS
	DENOTES METAL STUD WALL, SEE WALL FRAMING SCHEDULE
	DEPICTS LIGHTGAGE JAMB POST IN WALL, ALL JAMB POST ARE BUILT UP 3 STUD (TYP. U.N.O) SEE TYPICAL LIGHTGAGE DETAILS
DB	HSS8X4X3/8 DIVIDER BEAM, COORDINATE W/ APPROVED ELEVATEOR SHOP DRAWINGS FOR REQUIRED SIZE.
BR-#	DENOTES STRUCTURAL STEEL BRACE, SEE ELEVATION & DETAILS ON S-700
LDGR-1 LDGR-2	DENOTES CONTINUOUS LEDGER: LDGR-1 = CONT. L6X4X5/16" (LLV) LDGR-2 = CONT. L7X4X1/2 (LLV). SEE ATTACHMENT DETAILS.

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28 Pearl Street
PORT CHESTER, NEW YORK

ROOF FRAMING PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
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CHECKED BY: KP
PLOT DATE: 1/31/2025 4:42:14 PM
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PENTHOUSE ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

NOTES:
1. TOP OF SLAB ELEVATION = U.N.O. ON PLAN
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS, ELEVATIONS AND FLOOR/WINDOW OPENINGS
3. COORDINATE SLAB PENETRATIONS AND DEPRESSIONS WITH ARCH. AND MEP DRAWINGS.
4. ALL WALLS AND COLUMNS SHOWN ARE OF FLOOR BELOW
5. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH.
6. SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
7. PROVIDE SHORING UNTIL CONCRETE CYLINDERS REACH 75% OF SPECIFIED STRENGTH. SHORING LINES SHALL BE LOCATED A MAXIMUM OF 1'-0" FROM BEARING END OF DECK AND AS REQUIRED TO MEET UNSHORED SPAN LIMITS.SHORING BEAMS SHALL PROVIDE A MINIMUM BEARING WIDTH OF 4".
8. CONTRACTOR TO SHORE COMSLAB DECK DURING CONCRETE POUR PER MFR. RECOMMENDATIONS.
9. SEE SHEET S-700 FOR ADDITIONAL REINFORCEMENWT AT SHEAR WALL POST LOCATIONS.

METAL STUD WALL FRAMING SCHEDULE

MARK	3rd FLOOR	4th FLOOR	5th FLOOR	6th FLOOR	7th FLOOR	8th FLOOR	9th FLOOR	ROOF	PENTHOUSE
WALL A	(2) 600S250-97	(2) 600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S200-54	600S162-54
WALL B	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	600S162-54	600S162-54	
WALL C	600S200-97	600S200-97	600S200-97	600S200-68	600S200-68	600S200-54	600S162-54	600S162-54	
WALL D	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-97	600S200-68	600S162-54	
WALL E	(2) 600S250-97	(2) 600S250-97	600S350-97	600S350-97	600S250-97	600S200-97	600S200-68	600S200-54	
WALL F	(2) 600S350-97	(2) 600S300-97	(2) 600S250-97	(2) 600S250-97	600S350-97	600S300-97	600S200-97	600S200-68	

NOTES:
1. ALL STUDS ARE SPACED AT 16" O.C., UNLESS NOTED OTHERWISE. DOUBLED UP STUDS, NOTED IN SCHEDULE (2), SHALL BE 'I' SHAPED.
2. ALL WALL STUDS SHALL HAVE CHANNEL BRIDGING (CRC-112-16) SET STUD PUNCHOUTS AND ATTACHED IN ACCORDANCE WITH BRIDGING DETAIL SPACED AT 48" O.C. MAX.
3. FOR CONNECTION DETAILS, REFER TO TYPICAL LIGHT GAGE DETAILS.
4. WALL PANELS ARE TO HAVE CONTINUOUS TOP AND BOTTOM HORIZONTAL STANDARD TRACKS WITH 1 1/4" FLANGES AND A DEPTH MATCHING THE DEPTH OF THE PANEL WALL STUDS. USING THE FOLLOWING MINIMUM GAGES BASED ON THE GAGE OF THE TYPICAL WALL PANEL STUDS:
   18 GAGE TO 16 GAGE STUDS: 16 GAGE TRACK
   10 GAGE TO 14 GAGE STUDS: 14 GAGE TRACK

METAL STUD WALL OPENING SCHEDULE

MARK	3RD FLR.	4TH FLR.	5TH FLR.	6TH FLR.	7TH FLR.	8TH FLR.	9TH FLR.	ROOF	PENTHOUSE
E-1	(2) 600S200-97	(2) 600S200-68	(2) 600S200-68	(2) 600S200-54	(2) 600S200-68	(2) 600S162-54	(2) 600S162-54	(2) 600S200-54	
E-2	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 Φ ZN.5	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54 (2) 600S162-97 Φ ZN.5	
E-3	HSS6x6x3/16*	HSS6x6x3/16*	(3) 600S200-97 HSS8x8x3/16* Φ ZN.5	(3) 600S200-97	(3) 600S250-97	(2) 600S200-97	(2) 600S200-68 (2) 600S200-97 Φ ZN.5	(2) 600S200-54 (2) 600S200-68 Φ ZN.5	
E-4	HSS6x6x5/16**	HSS6x6x1/4**	HSS6x6x1/4**	HSS6x6x3/16*	HSS6x6x3/16*	(3) 600S200-97	(2) 600S200-97	(2) 600S200-68	
H-1	(2) 600S20068	(2) 600S20068	(2) 600S20068	(2) 600S200-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	(2) 600S162-54	
H-2	(3) 600S200-97	(2) 600S250-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-97	(2) 600S200-68	(2) 600S200-54	(2) 600S162-54	

STEEL BEAM SCHEDULE

MARK	SIZE	JAMB POST
B-1	HSS8x3x1/4 "ON FLAT"	
B-2		

CONCRETE BEAM SCHEDULE

MARK	SIZE (WxD)	LONGITUDINAL REBAR TOP	LONGITUDINAL REBAR BOTTOM	LONGITUDINAL REBAR SIDE BARS	TRANSVERSE TIES LEGS	TRANSVERSE TIES SIZE & SPACING
CB-1	8x12					
CB-2	10x12					
CB-3	48x48					

POST SCHEDULE

TYPE	POST SIZE
PA	HSS6x6x5/16

FRAMING LEGEND

MARK	DESCRIPTION
CS-1	COMSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #3 BARS @ EA. RIB
CS-2	COMSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #3 BARS @ EA. RIB
CS-3	COMSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #7 BARS @ EA. RIB
CS-4	COMSLAB FLOOR SYSTEM: 2 1/2" NORMAL WEIGHT CONCRETE OVER 8" X 0.0375 DECK (10.5" TOTAL THICKNESS) REINFORCED WITH W.W.F. 6X6-W2.9 X W2.9 AND CONT. #8 BARS @ EA. RIB
SL-1	4 1/2" NORMAL WEIGHT CONCRETE OVER 1 1/2" VLI 18 GA. WETAL DECK (6" TOTAL THICKNESS) REINFORCED WITH W.W.F.6X6-W2.9XW2.9
SL-5	10.5" NORMAL WEIGHT CONCRETE SLAB REINFORCED WITH #4@12" O.C. TOP & BOTTOM EACH WAY
SW-#	DENOTES LIGHT GAGE SHEAR WALL, SEE ELEVATION & DETAILS ON S-700
	DENOTES CONCRETE SHEAR WALL, SEE ENLARGED PLANS ON S-202
	DENOTES OPENING IN FLOOR, SEE ARCH./MECH. FOR SIZES & LOCATIONS
H-#/E-#	DENOTES OPENING IN WALL, SEE WALL OPENING SCHEDULE AND WALL SECTIONS
CCB-# WALL-#	INTEGRAL CONCRETE BEAM POURED MONOLITHICAL WITH COMSLAB FLOOR SYSTEM. SEE SCHEDULE AND SECTIONS
	DENOTES METAL STUD WALL, SEE WALL FRAMING SCHEDULE
⊠	DEPICTS LIGHTGAGE JAMB POST IN WALL. ALL JAMB POST ARE BUILT UP 3 STUD (TYP. U.N.O) SEE TYPICAL LIGHTGAGE DETAILS
DB	HSS8X4X3/8 DIVIDER BEAM, COORDINATE W/ APPROVED ELEVATEOR SHOP DRAWINGS FOR REQUIRED SIZE.
⊠ ⊠ BR-#	DENOTES STRUCTURAL STEEL BRACE, SEE ELEVATION & DETAILS ON S-700
LDGR-1	DENOTES CONTINUOUS LEDGER: LDGR-1 = CONT. L6X4X5/16" (LLV) LDGR-2 = CONT. L7X4X1/2 (LLV). SEE ATTACHMENT DETAILS.

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PENTHOUSE ROOF FRAMING PLAN

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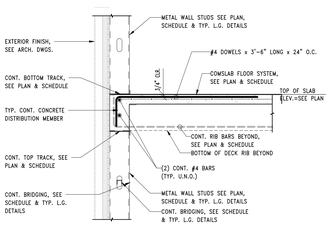
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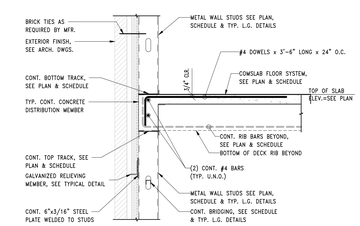
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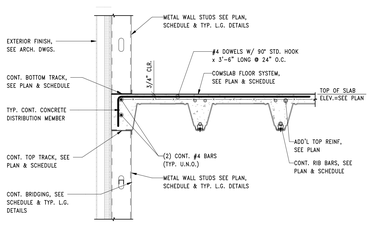


TYP. FULL HEIGHT STUD

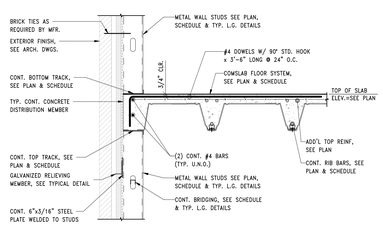


FULL HEIGHT STUD WITH BRICK

1 S-600 TYP. EXTERIOR WALL SECTIONS – DECK BEARING AT FULL HEIGHT STUD
Scale: 3/4" = 1'-0"

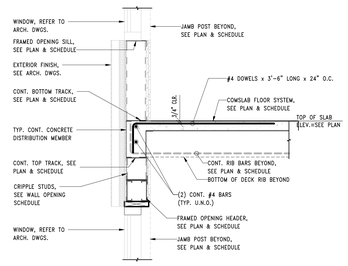


AT FULL HEIGHT STUD

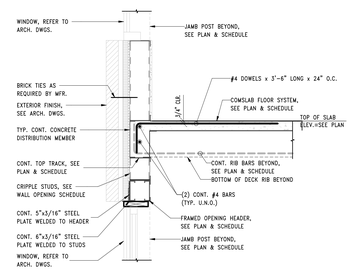


AT FULL HEIGHT STUD WITH BRICK

2 S-600 TYP. EXTERIOR WALL SECTIONS – DECK PARALLEL AT FULL HEIGHT STUD
Scale: 3/4" = 1'-0"



AT WINDOW OPENING WITH SILL



AT WINDOW OPENING WITH SILL AND WITH BRICK

3 S-600 TYP. EXTERIOR WALL SECTIONS – DECK BEARING AT WINDOW OPENINGS
Scale: 3/4" = 1'-0"

AT WINDOW OPENING WITH SILL

AT WINDOW OPENING WITH SILL AND BRICK

4 S-600 TYP. EXTERIOR WALL SECTIONS – DECK PARALLEL AT WINDOW OPENINGS
Scale: 3/4" = 1'-0"

5 S-600 TYP. EXTERIOR WALL SECTIONS AT MECHANICAL CLOSET
Scale: 3/4" = 1'-0"

6 S-600 TYP. EXTERIOR WALL SECTIONS AT BALCONY
Scale: 3/4" = 1'-0"

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TYPICAL FRAMING SECTIONS

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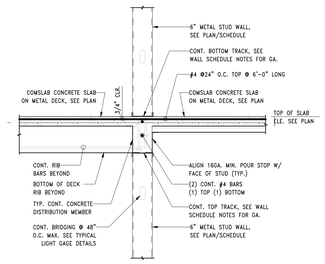
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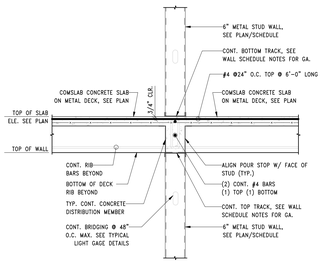
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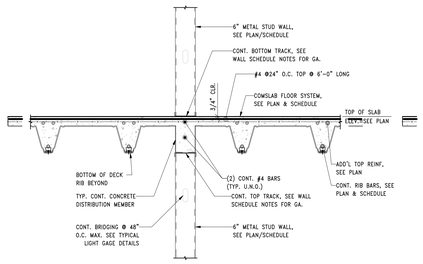
TYPICAL INTERIOR COMSLAB & CONCRETE OVER DECK BEARING DETAIL

SCALE: 3/4" = 1'-0"



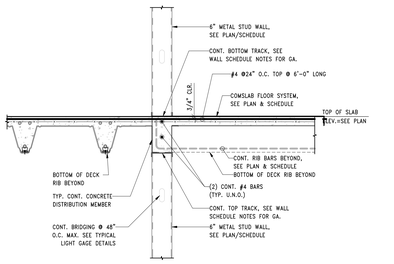
TYPICAL INTERIOR COMSLAB DECK BEARING DETAIL

SCALE: 3/4" = 1'-0"



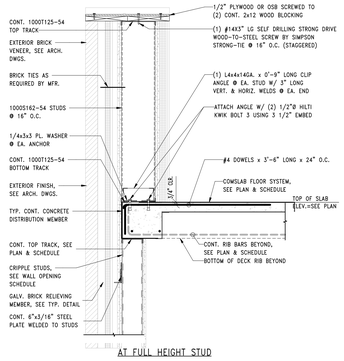
TYPICAL INTERIOR COMSLAB DECK PARALLEL DETAIL

SCALE: 3/4" = 1'-0"

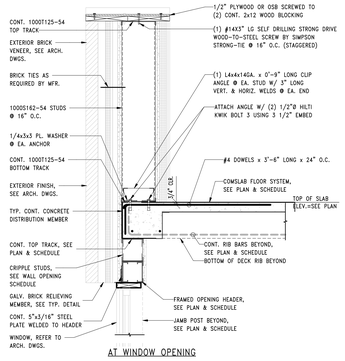


TYPICAL INTERIOR COMSLAB DECK BEARING & PARALLEL DETAIL

SCALE: 3/4" = 1'-0"



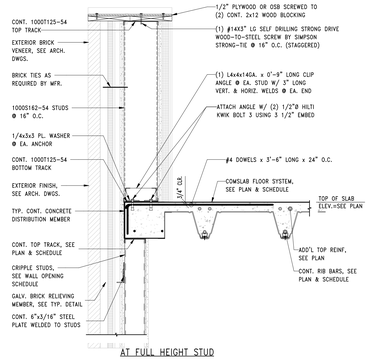
AT FULL HEIGHT STUD



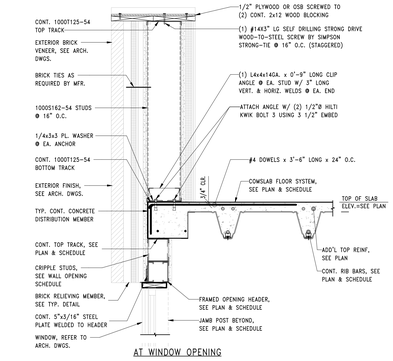
AT WINDOW OPENING

TYP. EXTERIOR TERRACE PARAPET SECTIONS – DECK BEARING CONDITION

SCALE: 3/4" = 1'-0"



AT FULL HEIGHT STUD



AT WINDOW OPENING

TYP. EXTERIOR TERRACE PARAPET SECTIONS – DECK BEARING CONDITION

SCALE: 3/4" = 1'-0"

NOTE:
MAX 2 OPENINGS EXCEEDING 12"x12" PER SPAN W/ CLEAR SPACING BETWEEN OPENINGS TWICE THE AVERAGE OPENING LENGTH

TYPICAL COMSLAB FLOOR SLAB OPENING SUPPORT DETAIL (< 18" WIDTH)

SCALE: 3/4" = 1'-0"

COMSLAB OPENING DETAIL - CONCRETE BEAM OPTION

TYPICAL COMSLAB FLOOR SLAB OPENING SUPPORT DETAIL (> 18" WIDTH)

SCALE: 3/4" = 1'-0"

C COMSLAB OPENING PARALLEL DETAIL

D COMSLAB OPENING PERPENDICULAR DETAIL

NOTE:
ALL DIMENSIONS SHOWN ARE ± 3/4" UNLESS OTHERWISE NOTED. DIMENSIONS ARE NOT TO BE SCALED. ALL DIMENSIONS TO BE VERIFIED IN FIELD. REPORT ANY DISCREPANCIES IMMEDIATELY TO ARCHITECT BEFORE PROCEEDING WITH WORK. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY, WITHOUT FIRST OBTAINING THE EXPRESS WRITTEN PERMISSION AND CONSENT OF LESSARD DESIGN INC. P.C.

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TYPICAL FRAMING SECTIONS

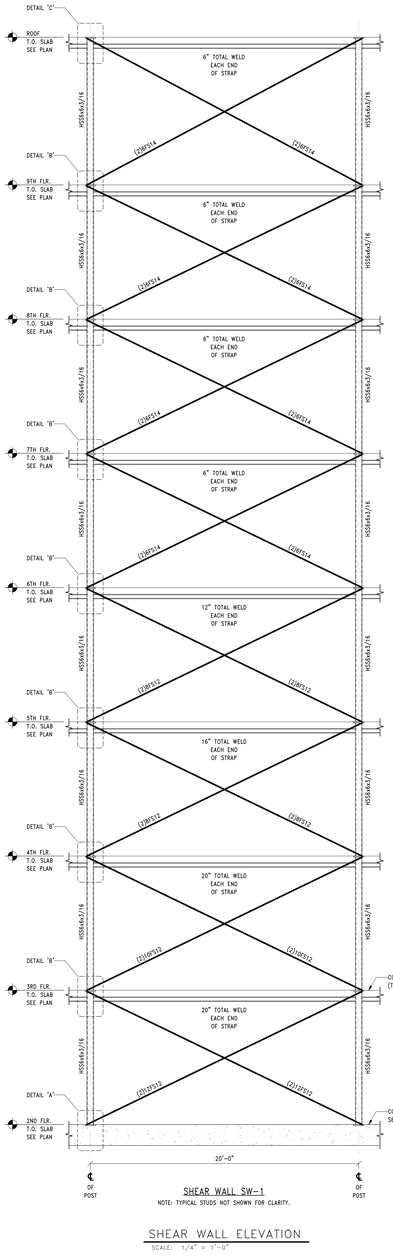
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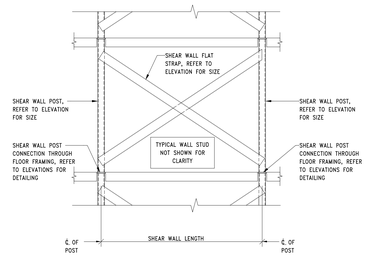


SHEAR WALL SW-1

NOTE: TYPICAL STUDS NOT SHOWN FOR CLARITY.

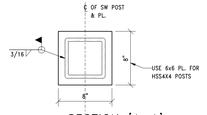
SHEAR WALL ELEVATION

SCALE: 1/4" = 1'-0"

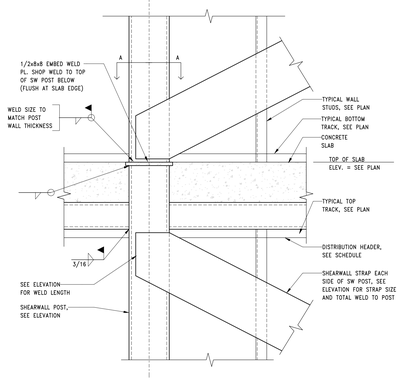


TYPICAL SHEAR WALL FRAME

NOT TO SCALE

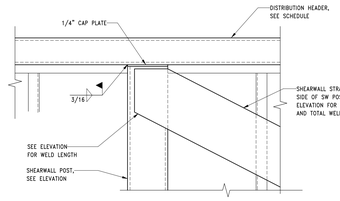


SECTION 'A-A'



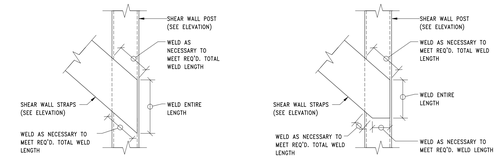
SHEAR WALL DETAIL A

NOT TO SCALE



SHEAR WALL DETAIL B

NOT TO SCALE



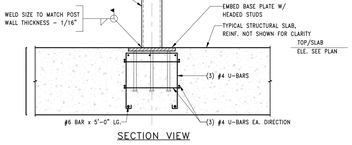
CONFIGURATION A

CONFIGURATION B

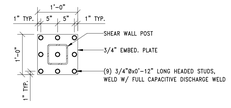
NOTES:
1. TOTAL WELD LENGTH IS LENGTH OF WELD REQ'D. AT EACH END OF STRAP. MIN. WELD TO BE 1/8" THK.
2. PROVIDE (1) STRAP EACH SIDE OF WALL IN EACH DIRECTION, AT EVERY LEVEL INDICATED ON SHEAR WALL ELEVATIONS.
3. REFER TO SHEAR WALL ELEVATIONS FOR STRAP AND POST SIZES & WELD LENGTHS.

TYP. SHEAR WALL STRAP WELDING DETAIL

NOT TO SCALE



SECTION VIEW



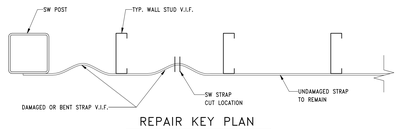
PLAN VIEW

TYPICAL SHEAR WALL BASE DETAIL C

NOT TO SCALE

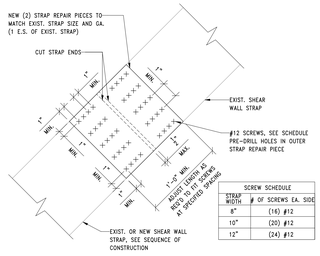
SEQUENCE OF CONSTRUCTION

1. CUT SHEAR WALL STRAP AT A MINIMUM 2ND STUD BAY FROM END OF SHEAR WALL
2. STRAIGHTEN STRAP WHERE POSSIBLE.
3. IF STRAP CAN BE STRAIGHTENED SO THAT THE MINIMUM REMAINING BOW IS LESS THAN ONE HALF INCH (AND STRAP IS NOT CUT OR TORN), INSTALL SPLICE REPAIR BELOW.
4. IF STRAP IS DAMAGED OR CANNOT BE STRAIGHTENED TO LIMITS NOTED IN STEP 3, REMOVE PORTION OF DAMAGED STRAP FROM CUT LOCATION THROUGH SHEAR WALL POST LOCATION AND REPLACE WITH NEW STRAP PIECE (SIZE, THICKNESS AND CONNECTIONS TO MATCH EXISTING). REMOVE WELDED CONNECTION TO SHEAR WALL POST BY GRINDING. TAKE CARE NOT TO DAMAGE TUBE WALL. THEN INSTALL SPLICE DETAIL BELOW



REPAIR KEY PLAN

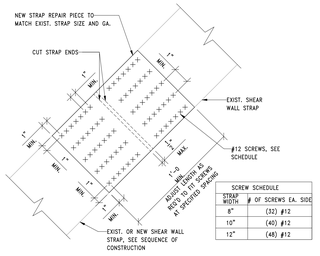
NOT TO SCALE



SCREW SCHEDULE	
STRAP WIDTH	# OF SCREWS EA. SIDE
8"	(16) #12
10"	(20) #12
12"	(24) #12

SHEAR WALL STRAP SPLICE DETAIL (2 PL. OPTION)

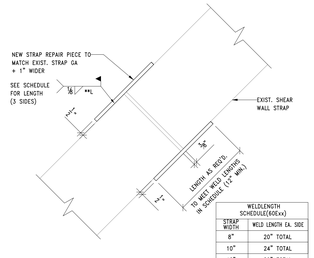
NOT TO SCALE



SCREW SCHEDULE	
STRAP WIDTH	# OF SCREWS EA. SIDE
8"	(32) #12
10"	(40) #12
12"	(48) #12

SHEAR WALL STRAP SPLICE DETAIL (1 PL. OPTION)

NOT TO SCALE



WELDLENGTH SCHEDULE(E60Exx)	
STRAP WIDTH	WELD LENGTH EA. SIDE
8"	20" TOTAL
10"	24" TOTAL
12"	28" TOTAL

ALTERNATE SHEAR WALL STRAP SPLICE DETAIL

NOT TO SCALE

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PORT CHESTER, NEW YORK

SHEAR WALL DETAILS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
DRAWN BY: PFS
CHECKED BY: KF
PLOT DATE: 1/31/2025 4:42:21 PM
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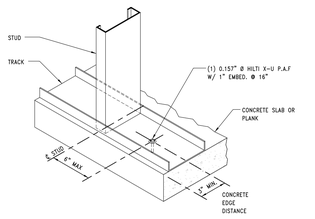
S-700

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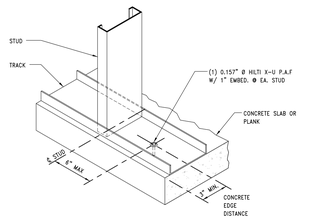
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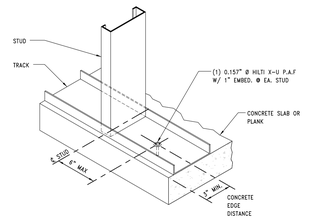
INTERIOR LOAD AND NON-LOAD BEARING WALL TRACK TO CONCRETE AT EACH STUD

NOT TO SCALE



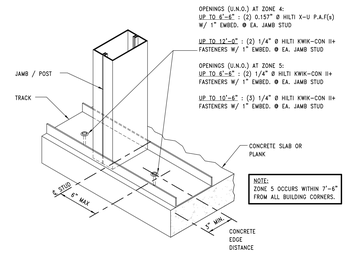
EXTERIOR LOAD BEARING WALL TRACK TO CONCRETE EACH STUD

NOT TO SCALE



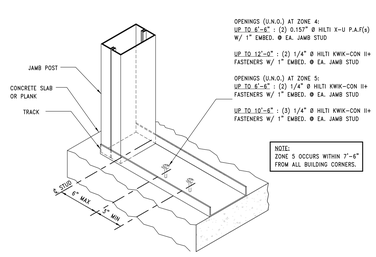
EXTERIOR NON-LOAD BEARING WALL TRACK TO CONCRETE EACH STUD

NOT TO SCALE



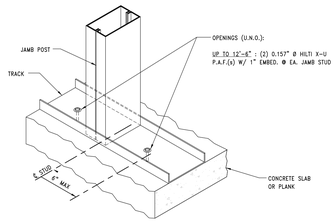
EXTERIOR WALL TRACK TO CONCRETE AT POST OR JAMB IN WALL PANEL

NOT TO SCALE



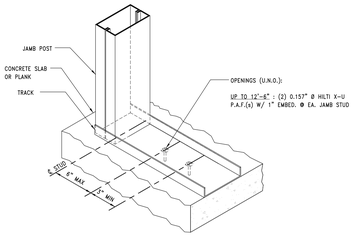
EXTERIOR WALL TRACK TO CONCRETE AT POST, JAMB OR END OF WALL PANEL

NOT TO SCALE



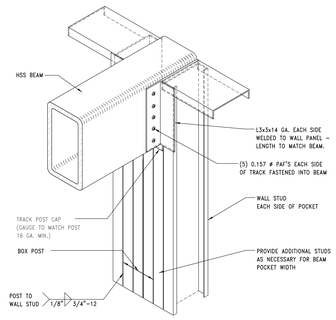
INTERIOR WALL TRACK TO CONCRETE AT POST OR JAMB IN WALL PANEL

NOT TO SCALE



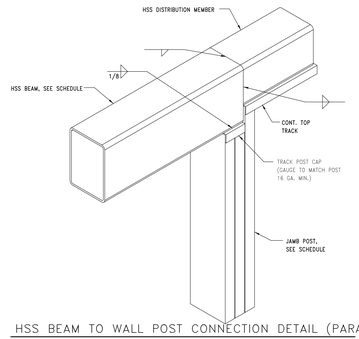
INTERIOR WALL TRACK TO CONCRETE AT POST, JAMB OR END OF WALL PANEL

NOT TO SCALE



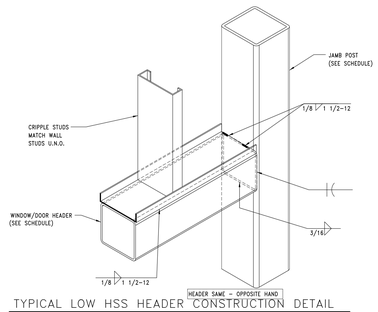
TYP. LIGHT GAGE HSS BEAM TO WALL POST CONNECTION (PERPENDICULAR)1

NOT TO SCALE



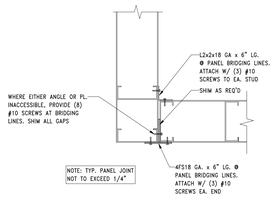
HSS BEAM TO WALL POST CONNECTION DETAIL (PARALLEL)

NOT TO SCALE

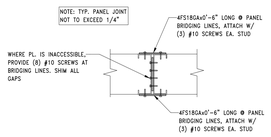


TYPICAL LOW HSS HEADER CONSTRUCTION DETAIL

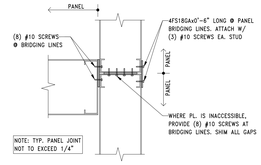
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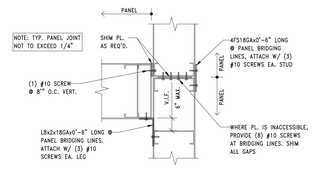
TYP. PANEL TO PANEL CONN. @ CORNER



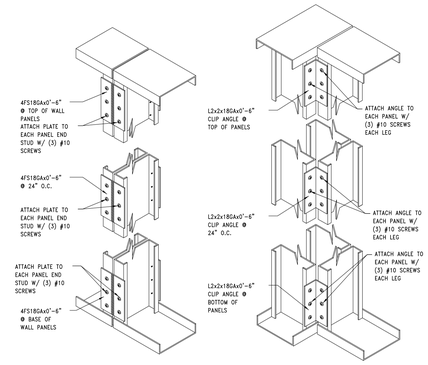
TYP. ADJACENT PANEL TO PANEL CONN.



TYP. PANEL TO PANEL CONN. AT STUD ≤ 6" FROM PANEL END STUD

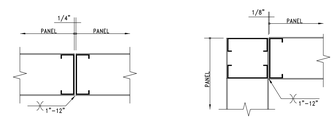


TYP. PANEL TO PANEL CONN. AT STUD 2" to 6" FROM PANEL END



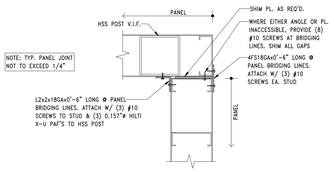
SCREWED END TO END

SCREWED CORNER

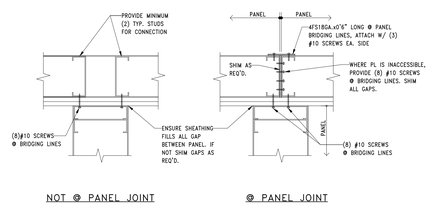


WELDED END TO END

WELDED CORNER



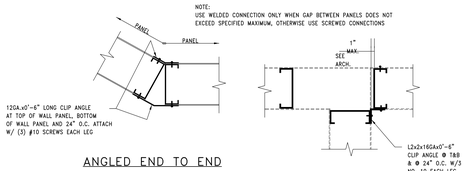
TYP. PANEL TO PANEL CONN. @ HSS POST



NOT @ PANEL JOINT

@ PANEL JOINT

TYP. PANEL TO PANEL CONN. @ CONT. SHEATHING



ANGLED END TO END

WALL PANEL TO WALL PANEL CONNECTIONS

NOT TO SCALE

WALL PANEL TO WALL PANEL CONNECTIONS

NOT TO SCALE

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Summit, NJ 07901

28 Pearl Street
PORT CHESTER, NEW YORK

TYPICAL LIGHT GAUGE CONNECTION DETAILS-1

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	75% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
DRAWN BY: FPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:42:24 PM
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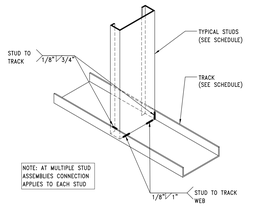
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Richard N. Christie, P.E.
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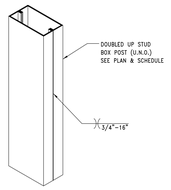
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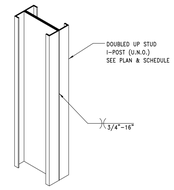
TYPICAL TRACK TO STUD DETAIL

NOT TO SCALE



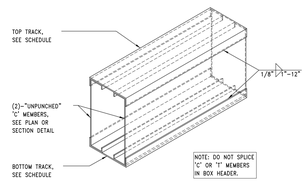
BOX POST CONSTRUCTION DETAIL

NOT TO SCALE



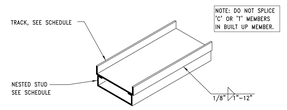
(2) STUD OR I-POST CONSTRUCTION DETAIL

NOT TO SCALE



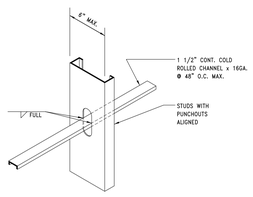
TYPICAL BOX HEADER/BEAM CONSTRUCTION DETAIL

NOT TO SCALE



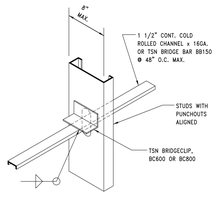
NESTED STUD AND TRACK CONSTRUCTION DETAIL

NOT TO SCALE



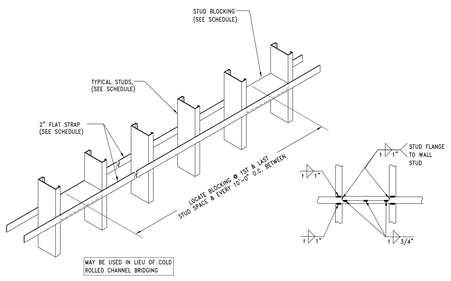
TYPICAL CHANNEL BRIDGING DETAIL

NOT TO SCALE



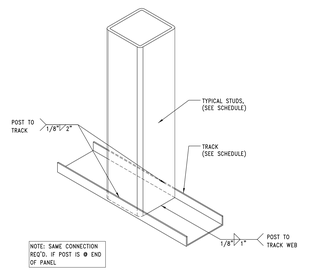
CHANNEL BRIDGING AT CRC CLIP (6" OR 8" WALLS) DETAIL

NOT TO SCALE



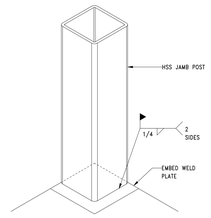
TYPICAL STRAP TYPE WALL BRIDGING

NOT TO SCALE



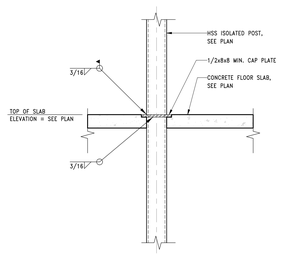
TYPICAL NON-SW POST TO TRACK DETAIL

NOT TO SCALE



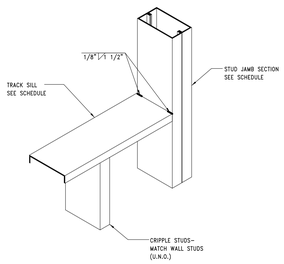
TYPICAL ISOLATED CORNER POST DETAIL

NOT TO SCALE



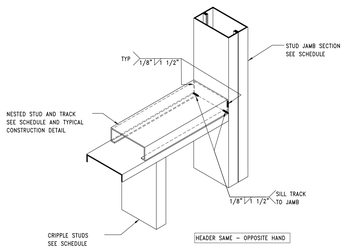
TYPICAL ISOLATED HSS POST TO HSS POST DETAIL

NOT TO SCALE



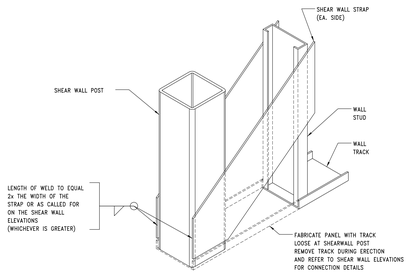
TYPICAL SINGLE TRACK SILL CONSTRCUTION DETAIL

NOT TO SCALE



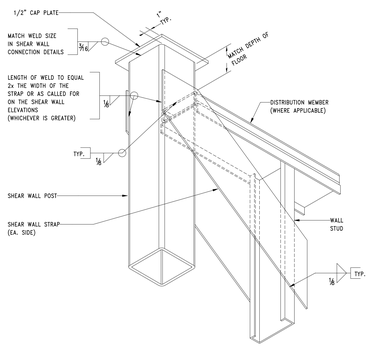
TYPICAL STUD + TRACK SILL CONSTRUCTION DETAIL

NOT TO SCALE



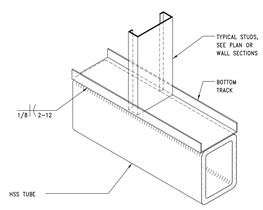
TYPICAL SHEARWALL POST BASE CONSTRUCTION DETAIL

NOT TO SCALE



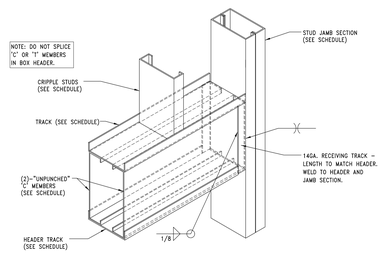
TYPICAL SHEARWALL POST CAP CONST.

NOT TO SCALE



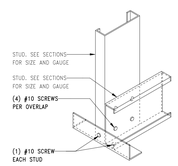
TYPICAL TRACK TO HSS TUBE CONSTRUCTION DETAIL

NOT TO SCALE



LOW BOX HEADER CONSTRUCTION DETAIL

NOT TO SCALE



TYPICAL STUD OVERLAP DETAIL

NOT TO SCALE

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TYPICAL LIGHT GAUGE CONNECTION DETAILS-2

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: CE#24-046
DRAWN BY: FPS
CHECKED BY: KP
PLOT DATE: 1/31/2025 4:42:26 PM
FILE NAME:

S-801

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MECHANICAL ABBREVIATIONS LIST

AC	AIR CONDITIONING UNIT	IU	INDUCTION UNIT
AD	ACCESS DOOR	KW	KILOWATT
AH	AIR HANDLING UNIT	KX	KITCHEN EXHAUST
ATC	AUTOMATIC TEMPERATURE CONTROL	LAT	LEAVING AIR TEMPERATURE
B(500)	DIFFUSER TYPE - REFER TO SCHEDULE	MBH	THOUSAND BTU PER HOUR
BMS	BUILDING MANAGEMENT SYSTEM	MCA	MINIMUM CIRCUIT AMPS
BTU	BRITISH THERMAL UNIT	MD	MOTORIZED DAMPER
CC	COOLING COIL	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NIC	NOT IN CONTRACT
CG	CEILING GRILLE	MD	MOTORIZED DAMPER
CHWP	CHILLED WATER PUMP	NC	NORMALLY CLOSED
CP	CONDENSATE PUMP	NIC	NOT IN CONTRACT
CR	CEILING REGISTER	NK	NECK SIZE
CUH	CABINET UNIT HEATER	NO	NORMALLY OPEN
CV	CONSTANT VOLUME	NTS	NOT TO SCALE
CWP	CONDENSER WATER PUMP	OAI	OUTSIDE AIR INTAKE
DC	DRY COOLER	OED	OPEN END DUCT
DX	DIRECT EXPANSION	PPH	POUNDS PER HOIUR
E	EXISTING	PH	PHASE
EAT	ENTERING AIR TEMPERATURE	PSI	POUND PER SQUARE INCH
EF	EXHAUST FAN	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
EG	EXHAUST GRILLE	PSIG	POUNDS PER SQUARE INCH GAUGE
ER	EXISTING EQUIPMENT TO BE REMOVED	RE	RELOCATED POSITION OF EXISTING EQUIPMENT
ERR	EXIST. EQUIP. TO BE REMOVED & RELOCATED	RF	RETURN FAN
EWT	ENTER WATER TEMPERATURE	SD	SMOKE DETECTOR
FXC	FLEXIBLE CONNECTION	TD	TRANSFER DUCT
FC	FAN COIL	TAO	TRANSFER AIR OPENING
FD	FIRE DAMPER WITH ACCESS DOOR	TR	TOP REGISTER
FLA	FULL LOAD AMPS	TX	TOILET EXHAUST
FPI	FIN PER INCH	TYP	TYPICAL
FTR	FIN TUBE RADIATION	VN	VENT
GPM	GALLONS PER MINUTE	V	VOLTS
GX	GENERAL EXHAUST	VAV	VARIABLE AIR VOLUME
HWP	HOT WATER PUMP	VD	VOLUME DAMPER
HX	HEAT EXCHANGER	VFD	VARIABLE FREQUENCY DRIVE
HZ	HERTZ	WMS	WIRE MESH SCREEN

MECHANICAL SYMBOL LIST - GENERAL

	NEW PIPING, DUCTWORK, OR EQUIPMENT
	EXISTING PIPING, DUCTWORK, OR EQUIPMENT TO REMAIN
	EXISTING PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED
	NEW EQUIPMENT
ER	EXISTING EQUIPMENT TO BE REMOVED
E	EXISTING EQUIPMENT TO REMAIN
ERR	EXISTING EQUIPMENT TO BE REMOVED AND RELOCATED
RE	RELOCATED POSITION OF EXISTING EQUIPMENT
	CONTINUATION FOR DUCTWORK OR PIPING
AHU 3-2	TYPE OF EQUIPMENT (AIR HANDLING UNIT) UNIT NUMBER (2ND AIR HANDLER ON THE 3RD FLOOR)
	POINT OF CONNECTION (OF NEW WORK TO EXISTING WORK)
	POINT OF DISCONNECTION (TO REMOVE AND PATCH EXISTING WORK)
#	DRAWING NOTE TAG
A	REVISION SYMBOL
A B	SECTION DESIGNATION ON DRAWING WHERE SECTION IS CUT A - SECTION DESIGNATION B - DRAWING NO.
T	THERMOSTAT WALL MOUNTED. (OCCUPANT ADJUSTABLE)
TH	TEMPERATURE SENSOR TO BE WALL OR DUCT MOUNTED (SENSOR ONLY, NO OCCUPANT ADJUSTMENT OR DISPLAY)
CO2	CARBON DIOXIDE OCCUPANCY DETECTOR
SD	DUCT MOUNTED SMOKE DETECTOR
LD	LEAK DETECTOR
AFMS	AIRFLOW MEASURING STATION
SP	STATIC PRESSURE SENSOR
	STARTER / DISCONNECT SWITCH
	STARTER

MECHANICAL SYMBOL LIST - DUCTWORK

	SUPPLY CEILING DIFFUSER (4-WAY BLOW)
	SUPPLY CEILING DIFFUSER (3-WAY BLOW)
	SUPPLY CEILING DIFFUSER (2-WAY BLOW)
	SUPPLY CEILING DIFFUSER (1-WAY BLOW)
	RETURN CEILING GRILLE OR REGISTER
	DOOR LOUVER
	UNDERCUT DOOR
18X12	DUCT SIZE (FIRST FIGURE INDICATES HORIZONTAL SIZE)
18ø	ROUND DUCT DIAMETER
	SUPPLY DUCT UP
	SUPPLY DUCT DOWN
	RETURN OR EXHAUST DUCT UP
	RETURN OR EXHAUST DUCT DOWN
	ACCOUSTICAL LINING IN DUCT
	TRANSITION FROM RECTANGULAR TO ROUND OR OVAL DUCT
AD	ACCESS DOOR IN DUCT
R	SLOPING RISE IN DUCT IN DIRECTION OF ARROW
D	SLOPING DROP IN DUCT IN DIRECTION OF ARROW
	MITERED ELBOW WITH TURNING VANES
	RADIUS ELBOW (INNER RADIUS = WIDTH)
	DUCT SPLIT
	90° BRANCH TAP (USE 45° BOOT, OR CONICAL TAP FOR BRANCH SERVING A SINGLE DIFFUSER/REGISTER ONLY)
	45° BRANCH TAP
	SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) RADIUS ELBOW TYPE
	SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) MITERED ELBOW TYPE WITH TURNING VANES
	SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) BULLHEAD TYPE
	OFFSET (WITH RADIUS ELBOWS)
	SUPPLY REGISTER
	RETURN OR EXHAUST REGISTER
VD	VOLUME DAMPER
FD	FIRE DAMPER W/DUCT ACCESS DOOR (FD/AD)
M	MOTORIZED DAMPER W/DUCT ACCESS DOOR
FSD	COMBINATION FIRE/SMOKE DAMPER W/DUCT ACCESS DOOR
SMD	SMOKE DAMPER W/DUCT ACCESS DOOR
FXC	FLEXIBLE CONNECTION
	FLEXIBLE DUCT
VD 1-0" MAX.	SUPPLY SIDEWALL LINEAR DIFFUSER (W/SHEET METAL PLENUM W/1" LINING & BRANCH CONN FOR EVERY 4' OF LINEAR DIFFUSER)
VD VD	MODULAR LINEAR DIFFUSER WITH PLENUM
VD	BRANCH TAKEOFF TO CEILING DIFFUSER/REGISTER

MECHANICAL SYMBOL LIST - PIPING

	DIRECTION OF FLOW IN PIPE
	PITCH PIPE DOWN IN DIRECTION OF ARROW
	ELBOW TURNED UP
	ELBOW TURNED DOWN
	BOTTOM PIPE CONNECTION
	TOP PIPE CONNECTION
	FLEXIBLE CONNECTION
	BALL VALVE
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE (ARROW INDICATES FLOW DIRECTION)
	AUTOMATIC THREE-WAY CONTROL VALVE
	AUTOMATIC TWO-WAY CONTROL VALVE
	PRESSURE REDUCING VALVE
	PLUG VALVE
	SOLENOID VALVE
	BUTTERFLY VALVE (MANUAL)
	BUTTERFLY VALVE (MOTORIZED)
	CIRCUIT SETTER/BALANCING VALVE
	PIPE GUIDE
	EXPANSION JOINT
	CONCENTRIC REDUCER (ARROW INDICATES FLOW DIRECTION)
	ECCENTRIC REDUCER (ARROW INDICATES FLOW DIRECTION)
	UNION
	CAPPED PIPE
	VALVED AND CAPPED CONNECTION (GATE)
	VALVED AND CAPPED CONNECTION (BALL)
	"Y" TYPE STRAINER WITH BLOW DOWN VALVE
	BASKET TYPE STRAINER
	DUPLEX STRAINER
	PIPE SLEEVE
	PIPE ANCHOR
	PIPE FLANGE
	VALVE IN VERTICAL PIPE
	HOSE BIBB
M	MANUAL AIR VENT
A	AUTOMATIC AIR VENT
	THERMOMETER
	PIPE SENSOR WELL
	PRESSURE GAUGE WITH SHUT OFF VALVE
	PUMP (RISER SYMBOL)
P S	PLATE AND FRAME HEAT EXCHANGER (RISER SYMBOL)
F FLOW	FLOW METER
M BTU	BTU METER
	PRESSURE RELIEF VALVE
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
DCW	DOMESTIC COLD WATER MAKE-UP
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CD	CONDENSATE DRAIN LINE (GRAVITY)
PD	PUMPED DRAIN LINE
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION

MECHANICAL - GENERAL NOTES

1. THESE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO CONVEY THE SCOPE OF WORK AS WELL AS INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, DUCTWORK AND PIPING. THE CONTRACTOR SHALL ADHERE TO THESE DRAWINGS AS CLOSELY AS POSSIBLE. HOWEVER, THE RIGHT IS RESERVED TO VARY THE RUNS OF DUCTWORK AND PIPING AND TO MAKE OFFSETS, WHERE NECESSARY, TO ACCOMMODATE CONDITIONS ARISING AT THE JOB SITE. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL. NO WORK SHALL BE PERFORMED PRIOR TO RECEIPT OF EQUIPMENT, DUCTWORK, AND PIPING FABRICATION SHOP DRAWING APPROVAL.
2. DRAWINGS AND SPECIFICATIONS SHALL BE INTERPRETED SO AS TO REQUIRE THE MOST SUBSTANTIAL AND COMPREHENSIVE PERFORMANCE OF THE WORK, CONSISTENT WITH THE INTENT AND REQUIREMENTS OF THE CONTRACT DOCUMENTS, AND SUCH WORK SHALL BE PERFORMED BY THE CONTRACTOR WITHOUT EXTRA COST TO THE OWNER.
3. ANY MATERIAL, WORK, OR INCIDENTAL ACCESSORIES OR MINOR DETAILS NOT SHOWN BUT NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SHOWN ON THE DRAWINGS, SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
4. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE ACOUSTICALLY LINED DUCT IS SPECIFIED, OUTER DUCT DIMENSIONS SHALL BE INCREASED TO ACCOMMODATE LINING.
5. WHERE WORK IS INDICATED TO BE BY OTHER CONTRACTORS, FOR EXAMPLE: "BY GENERAL CONSTRUCTION CONTRACTOR", THIS WORK IS NOT IN THE HVAC/MECHANICAL CONTRACT. EACH CONTRACTOR WILL BE RESPONSIBLE FOR CLOSE COORDINATION WITH OTHER CONTRACTORS' WORK.
6. REFER TO APPROPRIATE SPECIFICATION SECTION FOR EQUIPMENT SELECTION PARAMETERS WHERE DRAWINGS DO NOT CONTAIN EQUIPMENT SCHEDULES.
7. FOR AIR SYSTEMS, THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING BRANCH VOLUME DAMPERS FOR ALL SUPPLY, RETURN, AND EXHAUST BRANCH DUCTWORK, REGARDLESS IF VOLUME DAMPERS ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL VOLUME DAMPERS SHALL BE ADJUSTABLE HANDLE TYPE FOR LAY-IN ACCESSIBLE CEILING OR CABLE OPERATED FOR CONCEALED TYPE OF CEILING. ALL BRANCH DUCT VOLUME DAMPERS SERVING DIFFUSERS IN GYPSUM BOARD CEILINGS (OTHERWISE INACCESSIBLE) SHALL BE REMOTELY (CORD OR CABLE) OPERABLE THROUGH THE FACE OF THE DIFFUSER.
8. INSTALL THERMOSTATS, FAN SPEED CONTROLLERS, AND OTHER ROOM OCCUPANT ADJUSTABLE CONTROL DEVICES 4'-0" ABOVE FINISHED FLOOR OR AS DIRECTED OTHERWISE BY ARCHITECT. COORDINATE EXACT LOCATIONS WITH THE ARCHITECTURAL PLANS. DEVICE COLORS TO BE SELECTED BY THE ARCHITECT. MANUFACTURER'S LOGO SHALL NOT BE EXPOSED.
9. AC UNITS SHOWN ON DRAWINGS ARE SCHEMATIC. SEE AC UNIT DETAIL ON DETAIL SHEET FOR ACTUAL TYPICAL ARRANGEMENT REQUIRED.
10. WHERE PIPING CONNECTIONS FOR EQUIPMENT SUCH AS PUMPS, AC UNITS, COIL, ETC. DIFFER FROM THE LINE SIZE PIPING, IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FURNISH AND INSTALL THE NECESSARY REDUCER/EXPANDER FITTINGS TO ENABLE CONNECTION BETWEEN THE PIPING SYSTEM AND THE EQUIPMENT.
11. SOME PRESSURE AND TEMPERATURE GAUGES ARE SCHEMATICALLY SHOWN ON THE PLANS AND DETAILS. REFER TO THE SPECIFICATIONS FOR EXACT TYPES AND LOCATIONS.
12. PROVIDE UL 555 COMPLIANT FIRE DAMPERS AT ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS, REGARDLESS IF FIRE DAMPERS ARE NOT SHOWN IN CONTRACT DOCUMENTS. PROVIDE 1-1/2 HOUR RATED FIRE DAMPERS AT WALLS/FLOORS WITH 2 HOUR OR LESS RATING. PROVIDE 3 HOUR RATED FIRE DAMPERS AT WALLS/FLOORS WITH 3 HOUR OR MORE RATING. PROVIDE ACCESS DOORS IN DUCTWORK AND GENERAL CONSTRUCTION, 18"x18" UNLESS OTHERWISE NOTED.
13. PROVIDE COMBINATION FIRE/SMOKE DAMPERS AT ALL DUCT PENETRATIONS THROUGH FIRE AND SMOKE RATED WALLS AND FLOORS, REGARDLESS IF FIRE DAMPERS ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL COMBINATION FIRE/SMOKE DAMPERS SHALL BE PROVIDED WITH AN END SWITCH FOR STATUS SIGNAL TO THE BMS AND FIRE SMOKE CONTROL PANEL. PROVIDE ACCESS DOORS IN DUCTWORK AND GENERAL CONSTRUCTION, 18"x18" UNLESS OTHERWISE NOTED.
14. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING THERMOSTATS FOR ANY EQUIPMENT THAT REQUIRES CONTROL, SUCH AS HEAT PUMPS AND TERMINAL HEATERS, ETC., REGARDLESS IF THERMOSTATS ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL THERMOSTATS SHALL BE DIRECT DIGITAL PROGRAMMABLE TYPE, UNLESS OTHERWISE NOTED. PROVIDE ONE THERMOSTAT FOR EACH HEAT PUMP AND TERMINAL HEATER, ETC. THERMOSTAT LOCATIONS SHALL BE AS SHOWN ON PLANS AND/OR WHERE DIRECTED AND APPROVED BY THE ARCHITECT AND ENGINEER.
15. ALL DUCTWORK AND PIPING REQUIRING FIRE RATING AND WHERE SHOWN ON PLANS SHALL BE PROVIDED WITH A 2-HOUR FIRE RATED ENCLOSURE (PROVIDED UNDER ANOTHER SECTION OF THE SPECIFICATIONS).
16. ALL LINEAR DIFFUSERS ARE TO BE COORDINATED WITH ARCHITECTURAL PLANS FOR EXACT LENGTHS AND LOCATIONS. ACTIVE PLENUM SECTIONS SHALL BE OF THE SIZES AS SHOWN ON PLANS. EACH BRANCH TAP SERVING THE LINEAR DIFFUSER SHALL BE PROVIDED WITH A VOLUME DAMPER WHICH SHALL BE OPERABLE THROUGH THE DIFFUSER FACE. ACTIVE SUPPLY SECTION OF LINEAR DIFFUSER SHALL BE PROVIDED WITH PATTERN CONTROL DEVICES AND EQUALIZING GRIDS. ACTIVE OR INACTIVE RETURN SECTIONS SHALL NOT BE FURNISHED WITH PATTERN CONTROL OR EQUALIZING GRIDS.
17. BORDER TYPES AND METHOD OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES, AND REGISTERS SHALL BE COORDINATED WITH THE ARCHITECTURAL CEILING DETAILS AND SPECIFICATIONS.
18. REFER TO SPECIFICATIONS FOR ACOUSTIC LINING REQUIREMENTS NOT SHOWN ON THE DRAWINGS.
19. ALL HVAC WATER PIPING RUNNING ABOVE ELECTRICAL SERVICES SHALL BE PROVIDED WITH A DRAIN PAN UNDERNEATH BY THE MECHANICAL CONTRACTOR. PIPING FROM DRAIN PAN SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR AND EXTEND TO NEAREST FLOOR DRAIN.
20. FOR WATER SYSTEMS: THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING BALL TYPE SHUT-OFF VALVES AND SEPARATE BALANCING VALVE FOR ALL BRANCH PIPING REGARDLESS IF VALVES ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL SHUT-OFF VALVES SHALL BE FULL PORT AND PRESSURE RATED FOR SYSTEM PRESSURE. THE BALANCING VALVE SHALL BE SIMILAR TO B&G CIRCUIT SETTER PLUS CALIBRATED BALANCE VALVE, UNLESS OTHERWISE NOTED.
21. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING SECONDARY DRAIN PANS FOR ALL AIR CONDITIONING CEILING HUNG EQUIPMENT REGARDLESS IF DRAIN PANS ARE NOT SHOWN IN CONTRACT DOCUMENTS. REFER TO DETAIL FOR INSTALLATION OF DRAIN PANS. IF NO DETAIL IS SHOWN, CONTRACTOR MUST REQUEST DRAIN PAN DETAIL THRU RFI PROCESS DURING BIDDING.
22. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING CONDENSATE PIPING FOR ALL COOLING TYPE EQUIPMENT REGARDLESS IF CONDENSATE PIPING IS NOT SHOWN IN CONTRACT DOCUMENTS. ALL CONDENSATE PIPING SHALL BE INSULATED AND ROUTED TO NEAREST DRAIN OR JANITORS CLOSET. IF NO CONDENSATE PIPING IS SHOWN, CONTRACTOR MUST REQUEST CONDENSATE PIPING ROUTING THRU RFI PROCESS DURING BIDDING.
23. GENERAL NOTES, SYMBOLS, ABBREVIATIONS, AND DETAILS ARE APPLICABLE TO ALL HVAC/MECHANICAL DRAWINGS.
24. RELOCATE EXISTING WORK THAT INTERFERES WITH WORK OF THIS CONTRACT.
25. COORDINATE THIS WORK WITH THAT OF OTHER TRADES.
26. DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL, EXCEPT IN WAY OF STRUCTURAL STEEL, DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.
27. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURERS RECOMMENDATIONS.
28. PROVIDE ACCESS PANELS IN DUCTS AND CEILINGS/SOFFITS/WALLS/FLOORS IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS FOR ALL CONCEALED EQUIPMENT THAT REQUIRES PERIODIC SERVICE, INCLUDING AIR CONDITIONING UNITS, FANS, CONDENSATE PUMPS, FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, AND DUCT MOUNTED SMOKE DETECTORS.
29. PROVIDE HANGERS, INSERTS, ANCHORS, SUPPLEMENTAL STEEL & SUPPORTS AS REQUIRED TO SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM STRUCTURE.
30. SCHEDULE WORK OF THIS SECTION TO AVOID INTERFERING WITH EXISTING OPERATIONS IN THE FACILITY.
31. COORDINATE ALL ROOF PENETRATIONS WITH THE WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. COORDINATE ALL ROOF PENETRATION LOCATIONS WITH THE OWNER/LANDLORD. NOTIFY THE OWNER/LANDLORD PRIOR TO STARTING WORK AND VERIFY COMPLIANCE WITH BOND AND WARRANTY OF THE ROOF.
32. RUN DUCTS AND PIPING CONCEALED, UNLESS OTHERWISE SPECIFIED, AND CLEAR OF CEILING INSERTS.
33. PROVIDE CLEARANCE IN FRONT OF ALL ELECTRIC CONTROL PANELS PER N.E.C. AND EQUIPMENT MANUFACTURERS' REQUIREMENTS.
34. ALL MOTOR STARTERS FOR HVAC EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED/WIRED BY THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.
35. ALL DISCONNECT SWITCHES FOR HVAC EQUIPMENT SHALL BE FURNISHED, INSTALLED, AND WIRED BY THE ELECTRICAL CONTRACTOR, UNLESS INTEGRAL TO HVAC EQUIPMENT OR OTHERWISE NOTED.
36. USE FLAT TRANSVERSE SEAM FOR DUCTWORK WHERE SPACE AVAILABLE DICTATES.
37. BRANCH DUCTS TO INDIVIDUAL DIFFUSERS AND REGISTERS SHALL BE THE SAME SIZE AS THE DIFFUSER OR REGISTER NECK, UNLESS OTHERWISE NOTED.
38. ALL DUCTWORK AND PIPING SHALL BE INSTALLED TIGHT TO BOTTOM OF STRUCTURAL MEMBERS UNLESS OTHERWISE NOTED OR ABSOLUTELY REQUIRED BY FIELD CONDITIONS.
39. DO NOT INSTALL DUCTWORK OR PIPING DIRECTLY UNDER AND PARALLEL TO THE WEB OF STRUCTURAL MEMBERS. OFFSET IN ORDER TO ALLOW FUTURE DUCTWORK AND PIPING TO CROSS OVER BETWEEN STRUCTURAL MEMBERS.
40. NEW AND EXISTING PERMANENT HVAC AIR EQUIPMENT SHALL NOT BE USED BY ANY CONTRACTOR DURING CONSTRUCTION FOR TEMPORARY HEATING, COOLING, OR VENTILATION:
    - IF TEMPORARY HEATING, COOLING, OR VENTILATION IS REQUIRED AT ANY POINT DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TEMPORARY HEATING, COOLING, OR VENTILATION EQUIPMENT, DUCTWORK, CONTROLS, PIPING, AND POWER AT HIS OWN EXPENSE.
    - DURING CONSTRUCTION, ALL NEW AND EXISTING PERMANENT HVAC AIR EQUIPMENT SHALL BE PROTECTED FROM DUST AND DEBRIS. COVER ALL OPENINGS WITH HEAVY POLYETHYLENE PLASTIC AND TAPE AIR TIGHT. WHEN GENERAL CONSTRUCTION IS COMPLETE, VACUUM CLEAN INSIDE OF UNITS AND REMOVE ANY CONSTRUCTION DEBRIS.
    - DURING CONSTRUCTION, ALL OPEN OR INCOMPLETE DUCTWORK SHALL BE CAPPED AIRTIGHT WITH HEAVY POLYETHYLENE PLASTIC. AFTER THE INSTALLATION OF DUCTWORK, REGISTERS, GRILLES, AND DIFFUSERS, THE CONTRACTOR SHALL BLANK OFF ALL REGISTERS, GRILLES, AND DIFFUSERS WITH HEAVY POLYETHYLENE PLASTIC AND TAPE AIR TIGHT, IN AREAS THAT ARE UNDER CONSTRUCTION, UNTIL WORK IS COMPLETE IN THOSE AREAS.
    - WHEN GENERAL CONSTRUCTION IS COMPLETE, VACUUM CLEAN ALL DIFFUSERS, REGISTERS, GRILLES, AND HVAC EQUIPMENT IN THE PROJECT AREA OR SERVING THE PROJECT AREA. REMOVE ANY CONSTRUCTION DEBRIS.

NEW YORK STATE CODES & STANDARDS

- 2020 BUILDING CODE OF NEW YORK STATE
- 2020 FIRE CODE OF NEW YORK STATE
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE
- 2020 FUEL GAS CODE OF NEW YORK STATE
- 2020 NYS UNIFORM CODE SUPPLEMENT
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL
- ALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

NEW YORK STATE ENERGY CODES

- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2016 ASHRAE 90.1
- 2020 SUPPLEMENT TO THE NEW YORK STATE ENERGY CONSERVATION CODE

LOCAL CODES

- PORTCHESTER MUNICIPAL CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2016 NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- 2016 NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
- 2016 NFPA 20 - STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE FOR PROTECTION
- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE
- 2016 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE

MECHANICAL SHEET LIST

SHEET NUMBER	SHEET NAME
M-001	MECHANICAL COVER SHEET
M-101	MECHANICAL CELLAR 2 & CELLAR 1 FLOOR PLANS
M-102	MECHANICAL FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN
M-103	MECHANICAL 2ND & TYPICAL (3RD-7TH) FLOOR PLAN
M-104	MECHANICAL 8TH & 9TH FLOOR PLAN
M-105	MECHANICAL BUILDING ROOF & PENTHOUSE ROOF PLAN
M-201	MECHANICAL TYPICAL UNIT PLANS
M-301	MECHANICAL SCHEDULES
M-302	MECHANICAL SCHEDULES
M-401	MECHANICAL DETAILS
M-402	MECHANICAL DETAILS
M-403	MECHANICAL DETAILS

ARCHITECT:

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28 PEARL STREET
PORTCHESTER, NY

MECHANICAL COVER SHEET

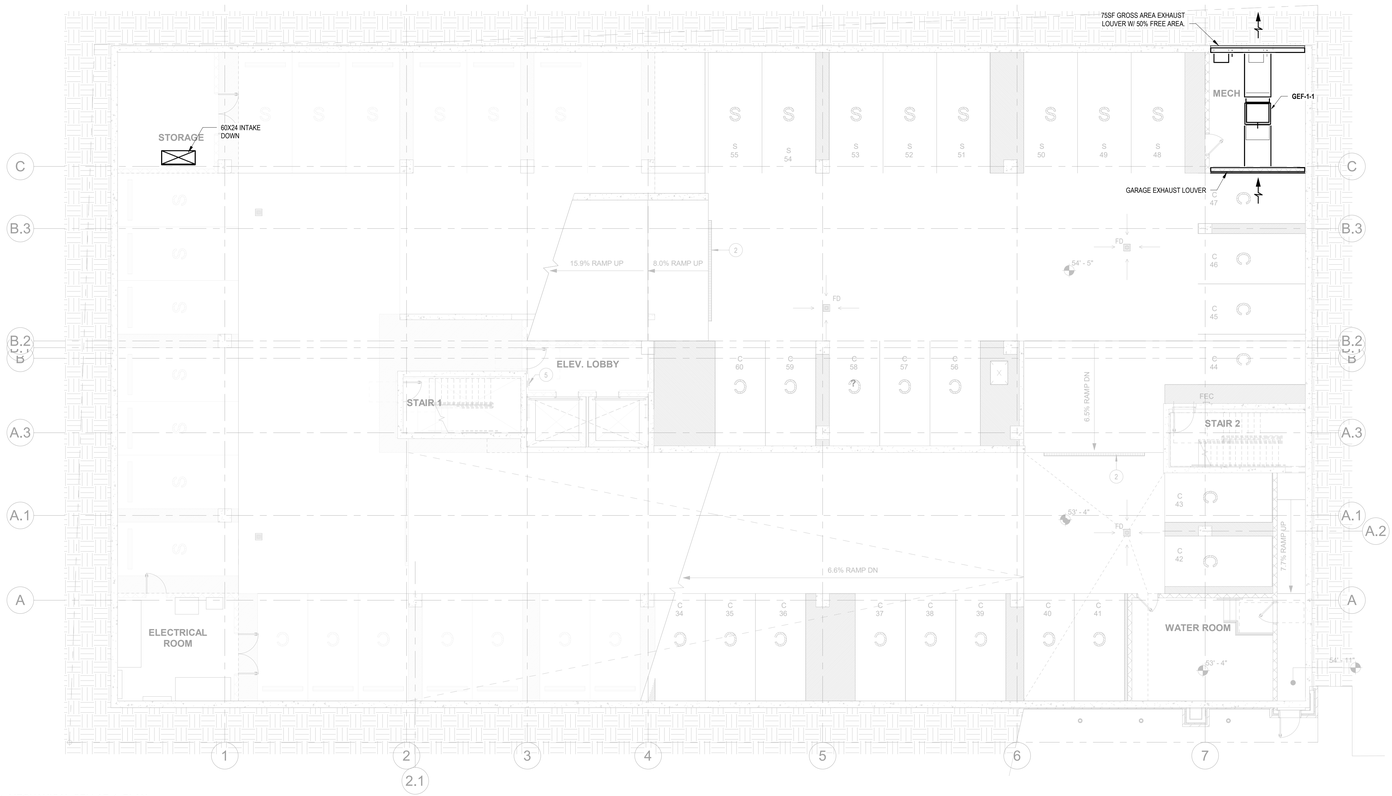
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	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

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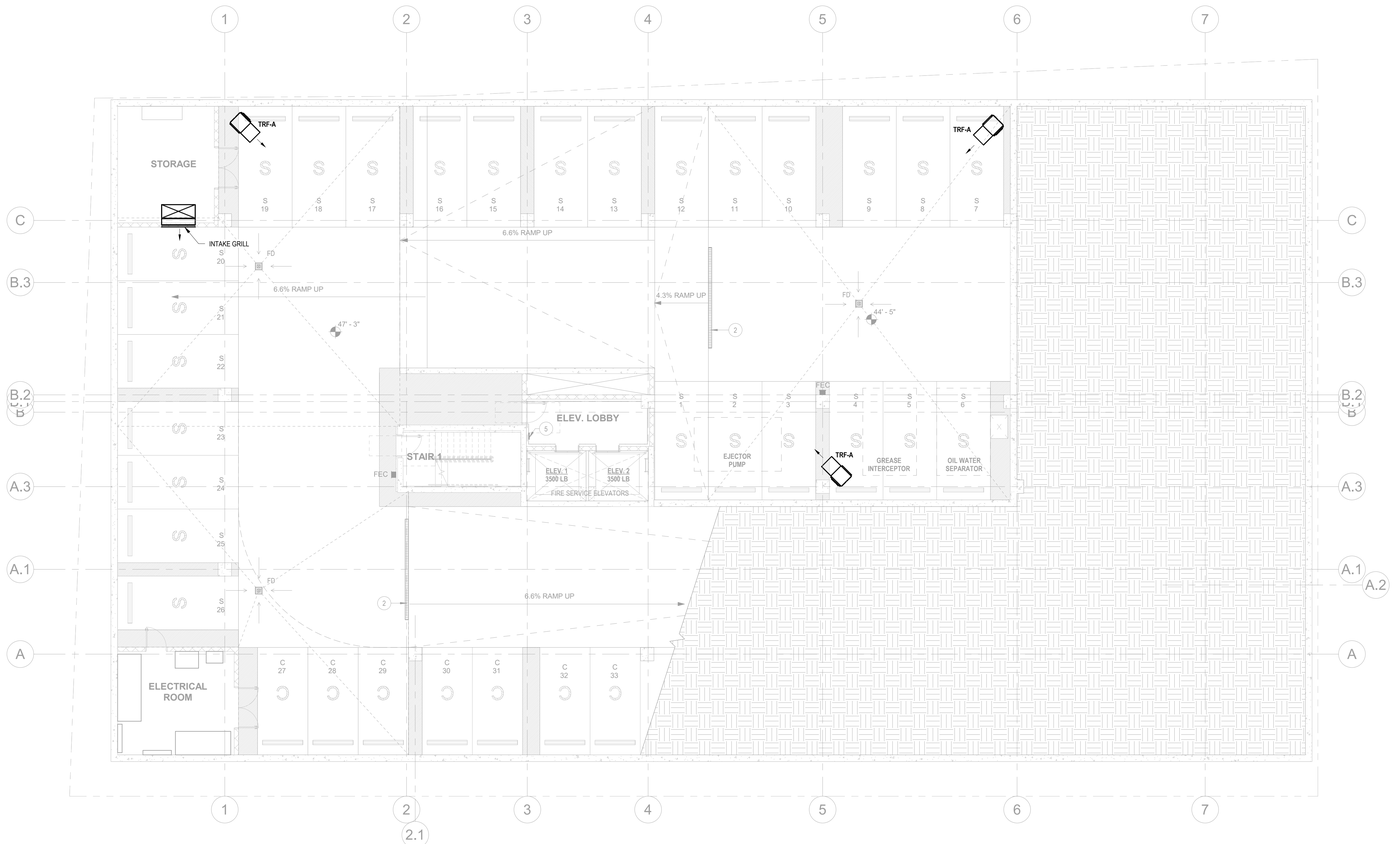
M-001

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1 MECHANICAL CELLAR 1 PLAN
1/8" = 1'-0"



2 MECHANICAL CELLAR 2 PLAN
1/8" = 1'-0"

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PORTCHESTER, NY

MECHANICAL CELLAR 2 & CELLAR 1 FLOOR PLANS

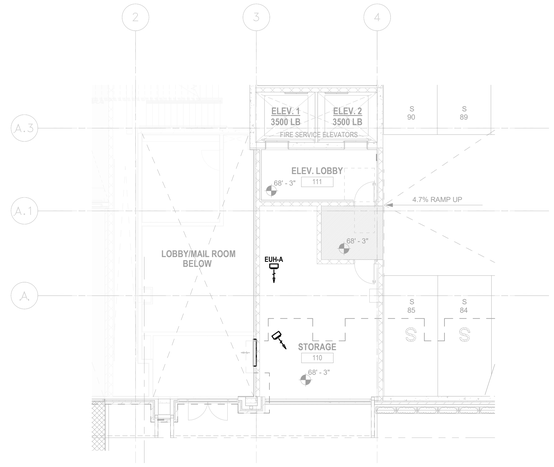
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M-101

PROJECT NORTH

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2 MECHANICAL FIRST FLOOR UPPER ELEVATOR LOBBY & STORAGE PLAN
1/8" = 1'-0"



1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

PROJECT
NORTH

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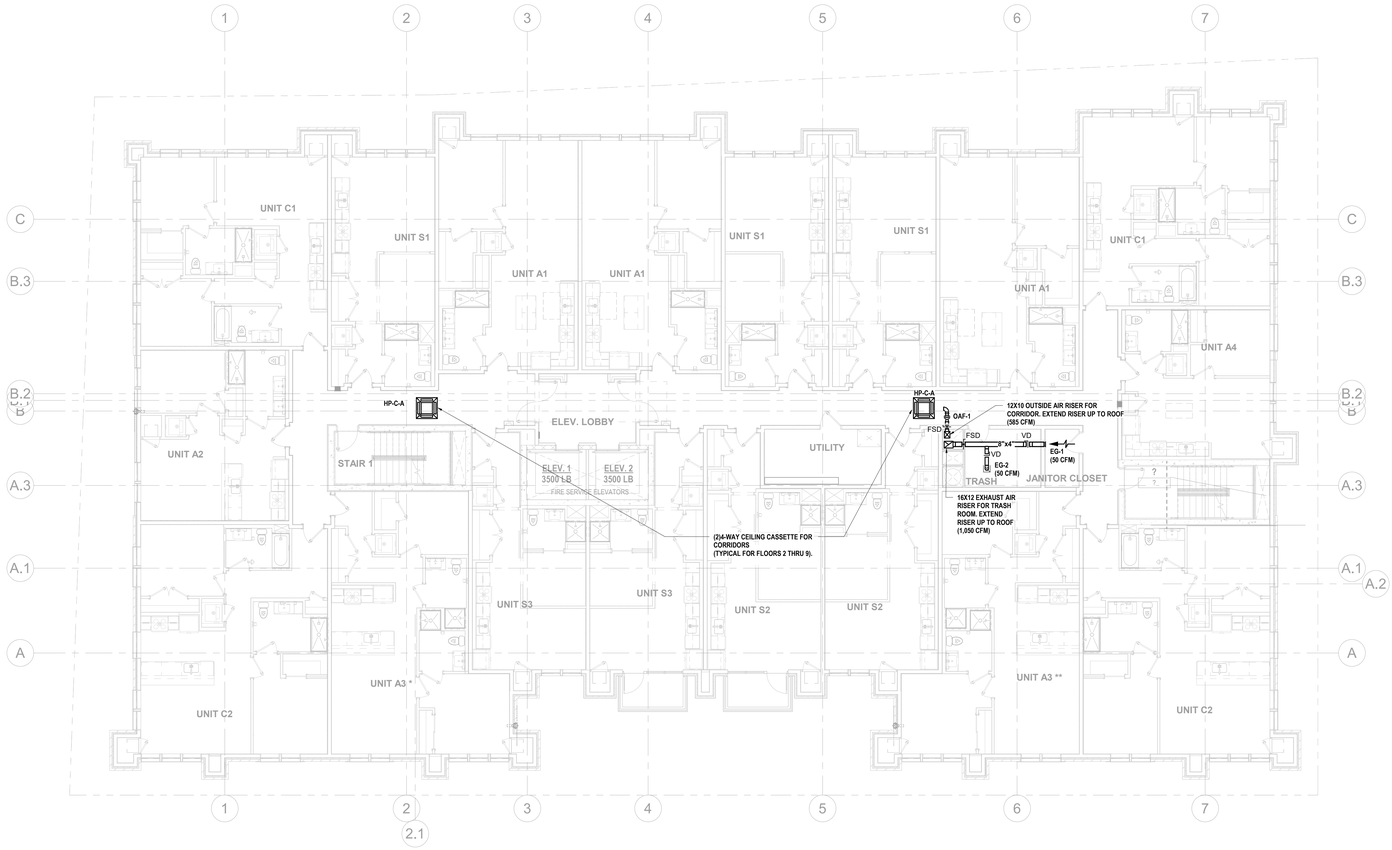
MECHANICAL FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

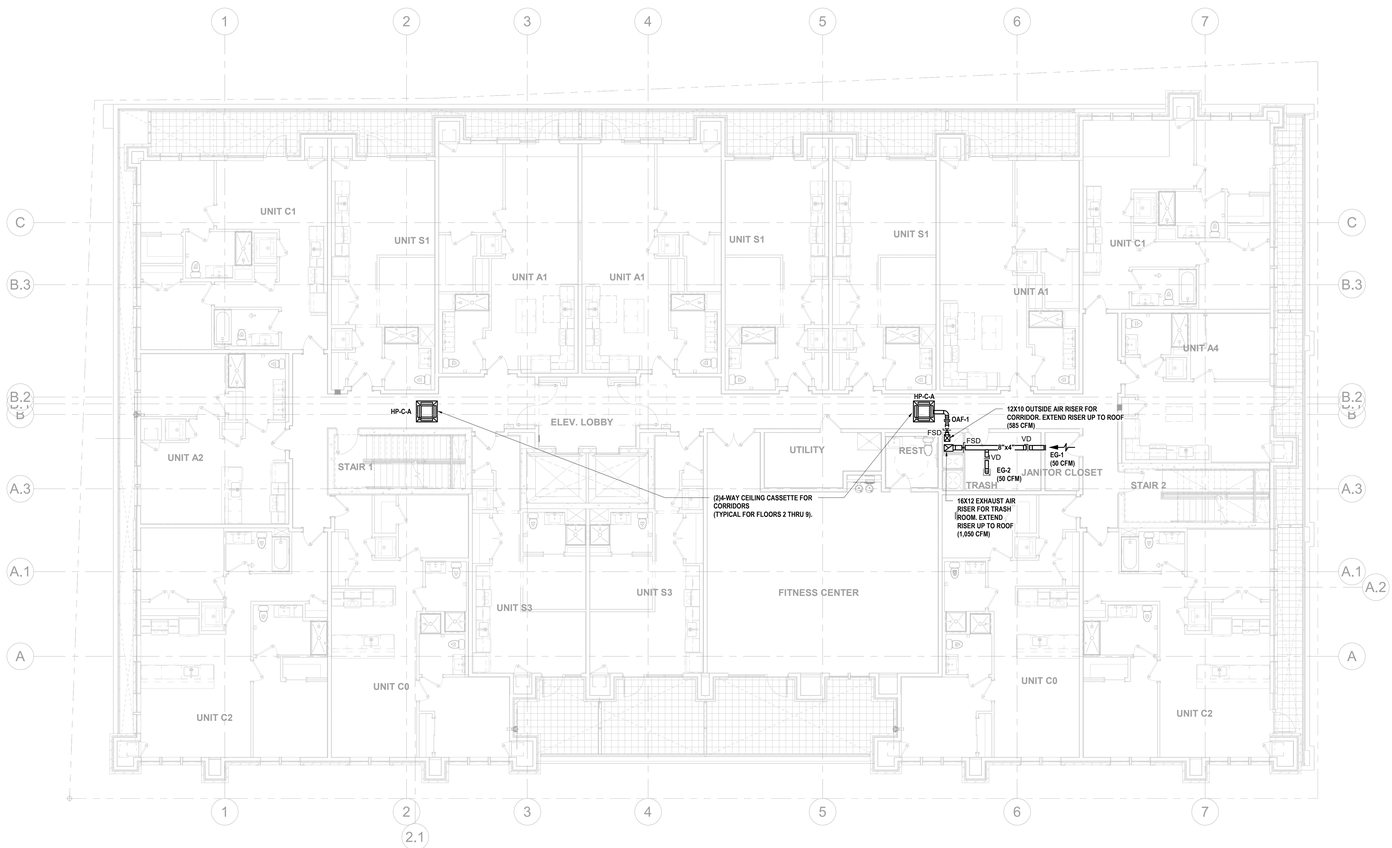
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FILE NAME:

M-102

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2 MECHANICAL 3RD-7TH FLOOR PLAN
1/8" = 1'-0"



1 MECHANICAL 2ND FLOOR PLAN
1/8" = 1'-0"

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PORTCHESTER, NY

MECHANICAL 2ND & TYPICAL (3RD-7TH) FLOOR PLAN

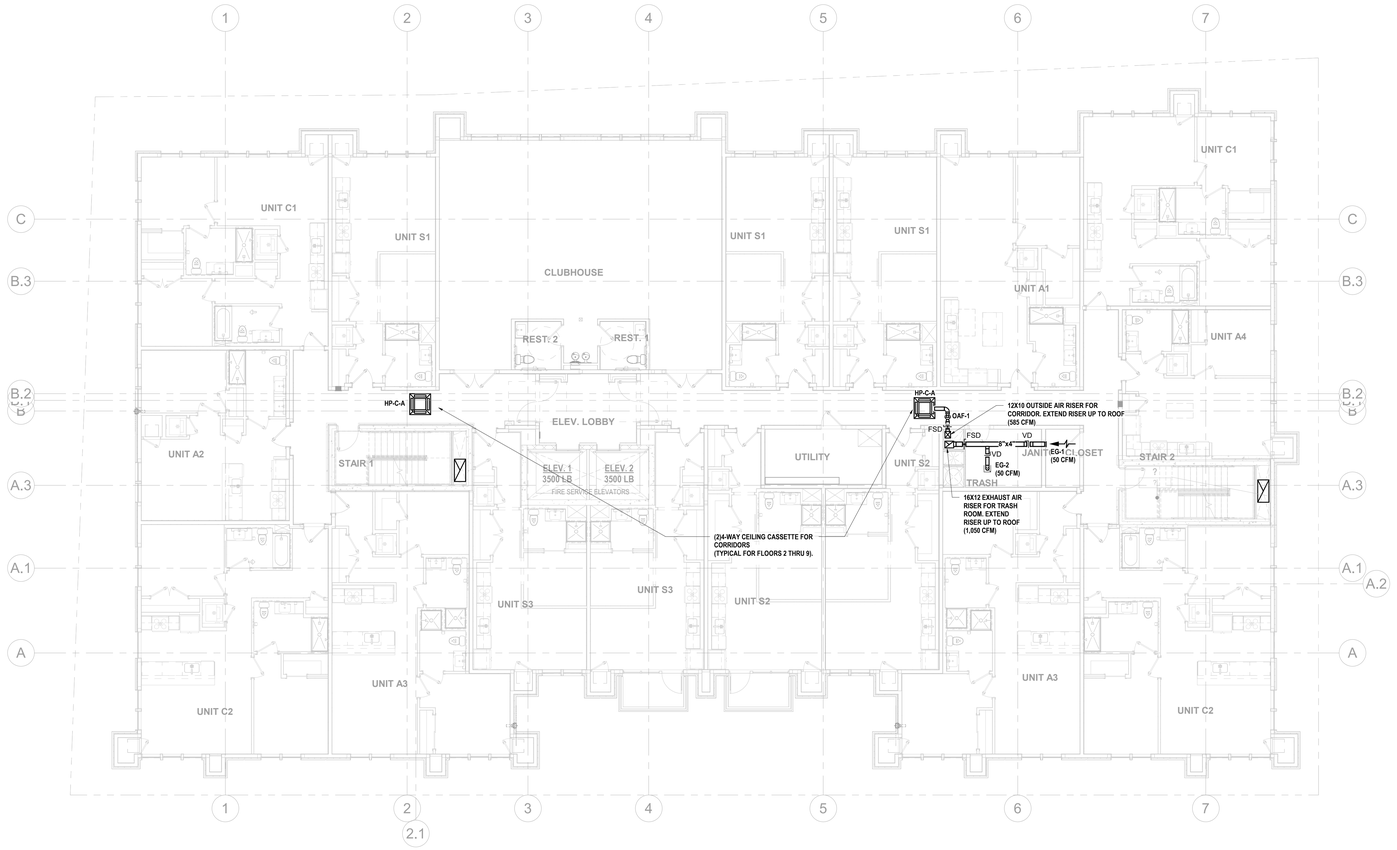
NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

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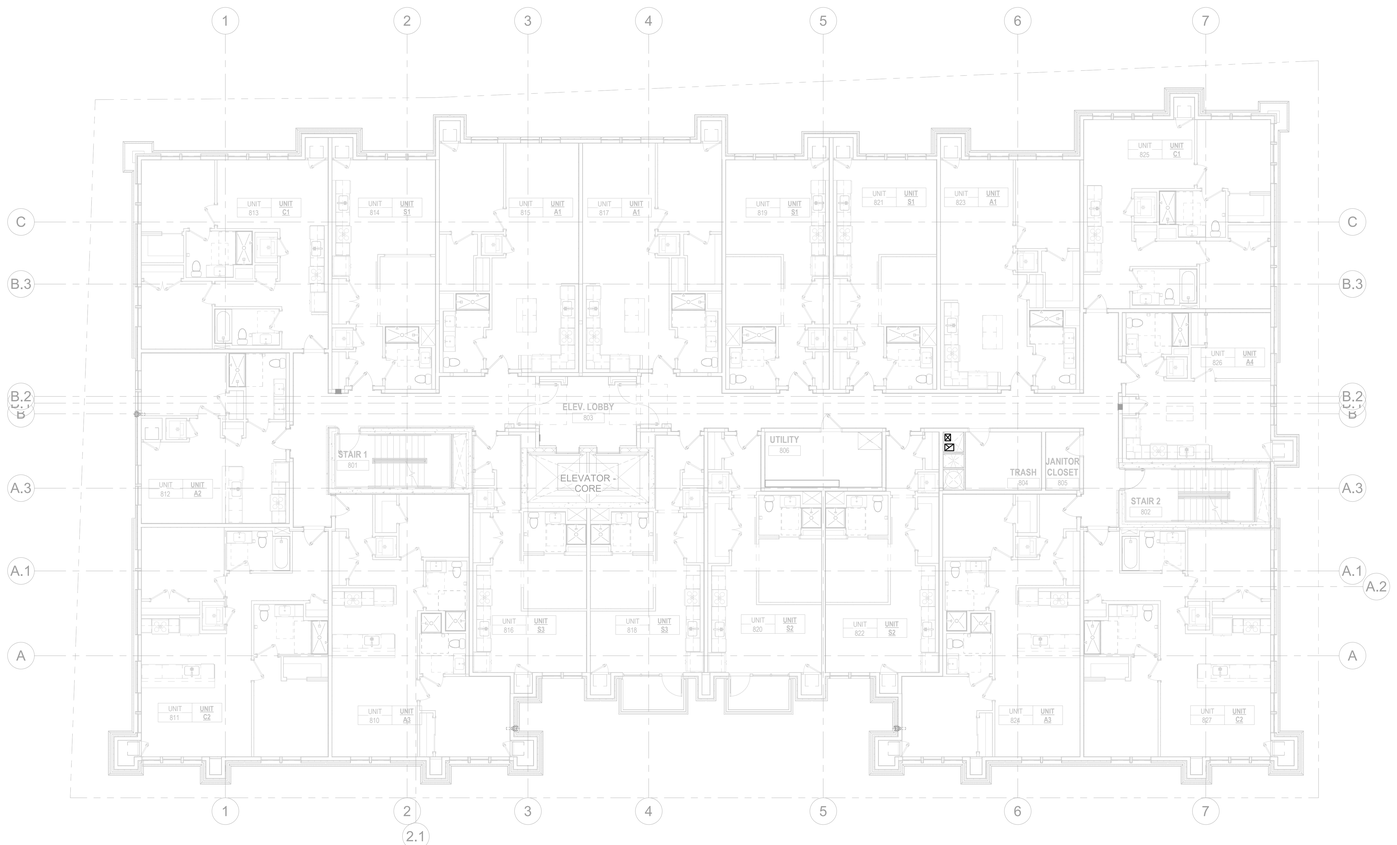
PROJECT NORTH

M-103

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2 MECHANICAL 9TH FLOOR PLAN
1/8" = 1'-0"



1 MECHANICAL 8TH FLOOR PLAN
1/8" = 1'-0"

PROJECT NORTH

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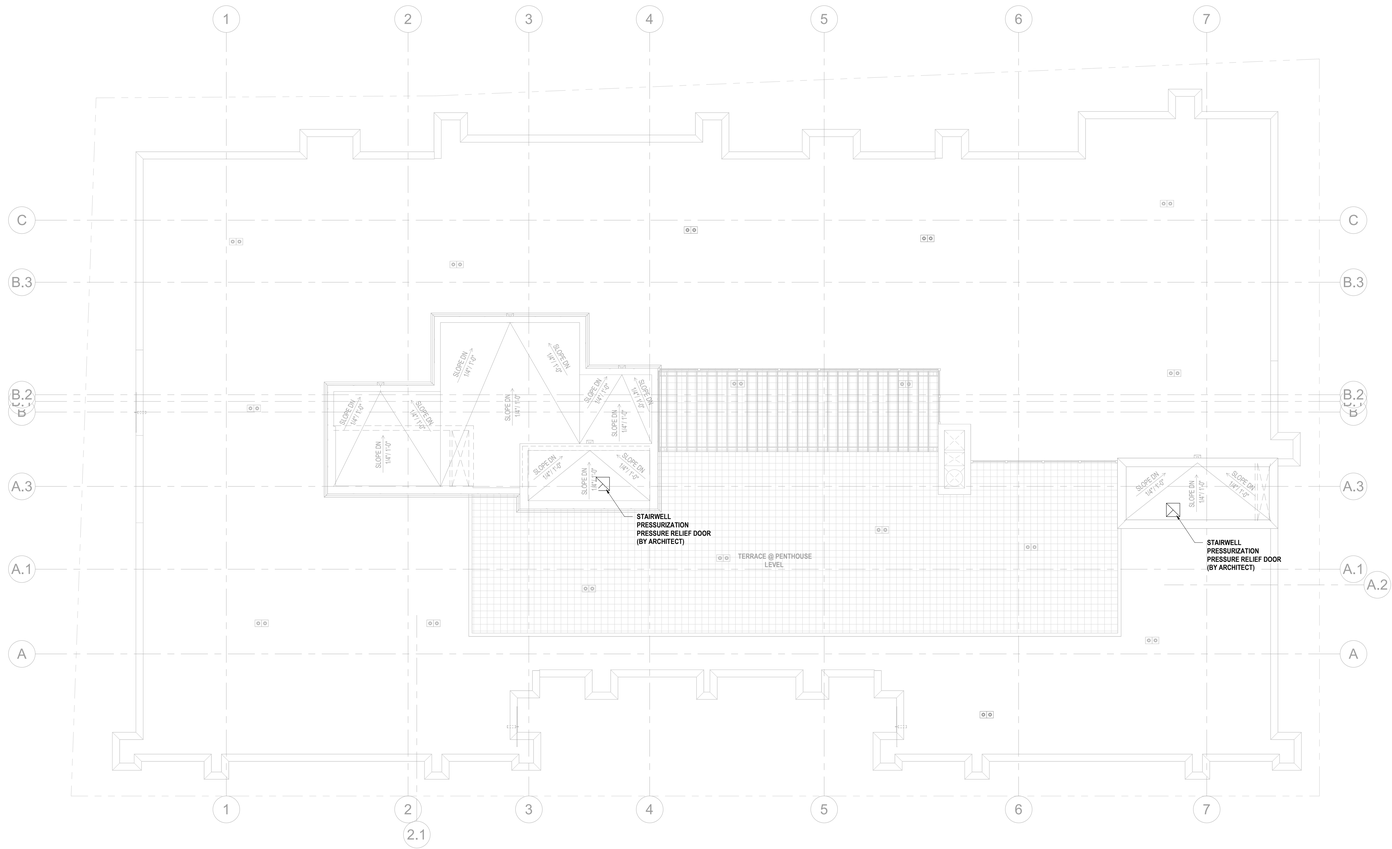
MECHANICAL 8TH & 9TH FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

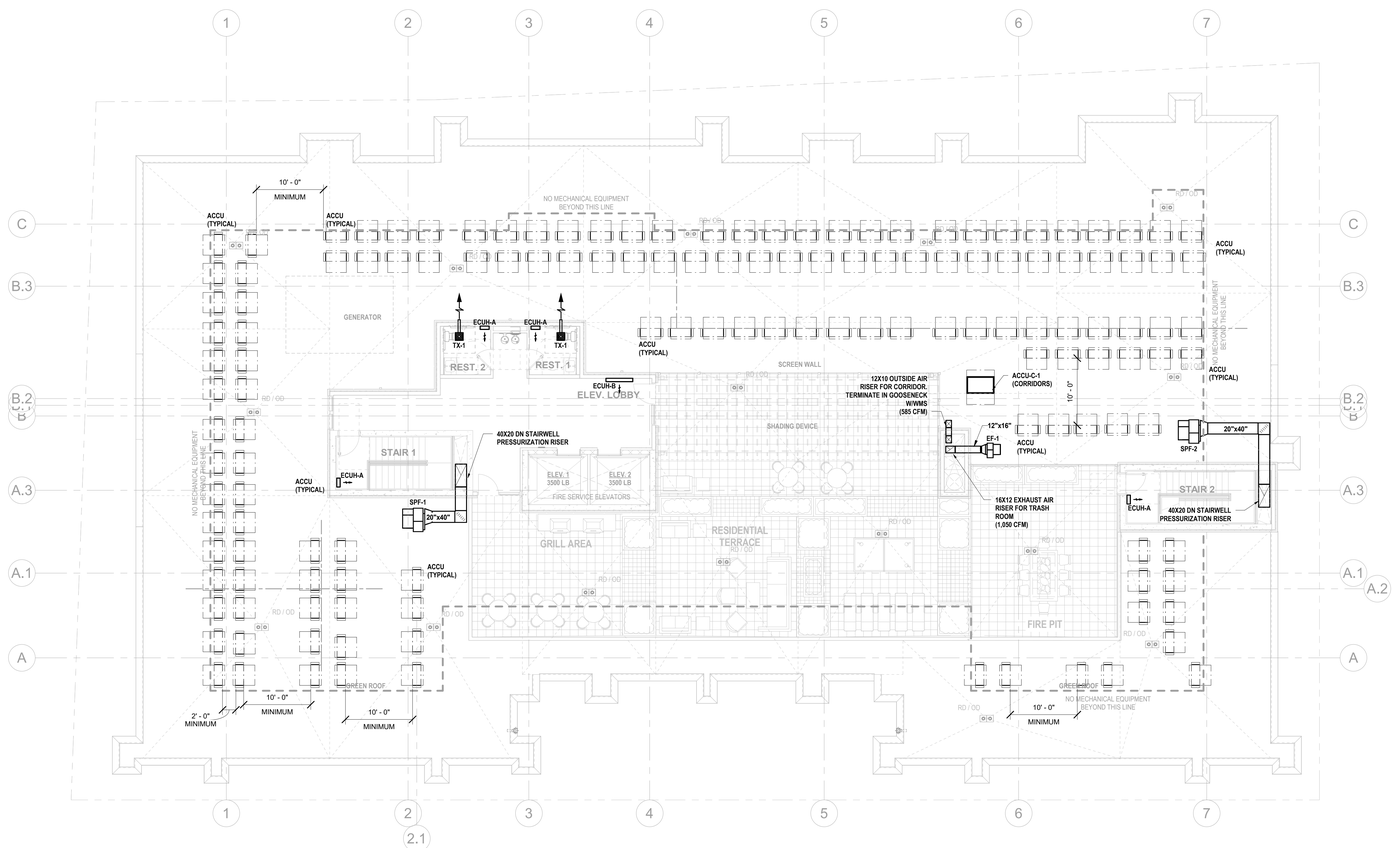
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2 MECHANICAL PENTHOUSE ROOF PLAN
1/8" = 1'-0"



1 MECHANICAL BUILDING ROOF PLAN
1/8" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

MECHANICAL BUILDING ROOF & PENTHOUSE ROOF PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
DRAWN BY: PK/CC
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FILE NAME:

M-105

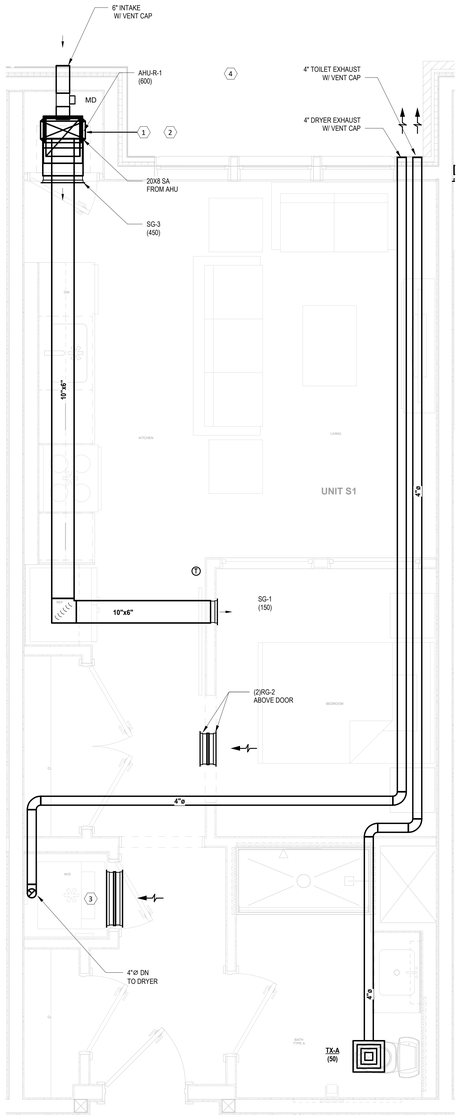
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MECHANICAL GENERAL NOTES

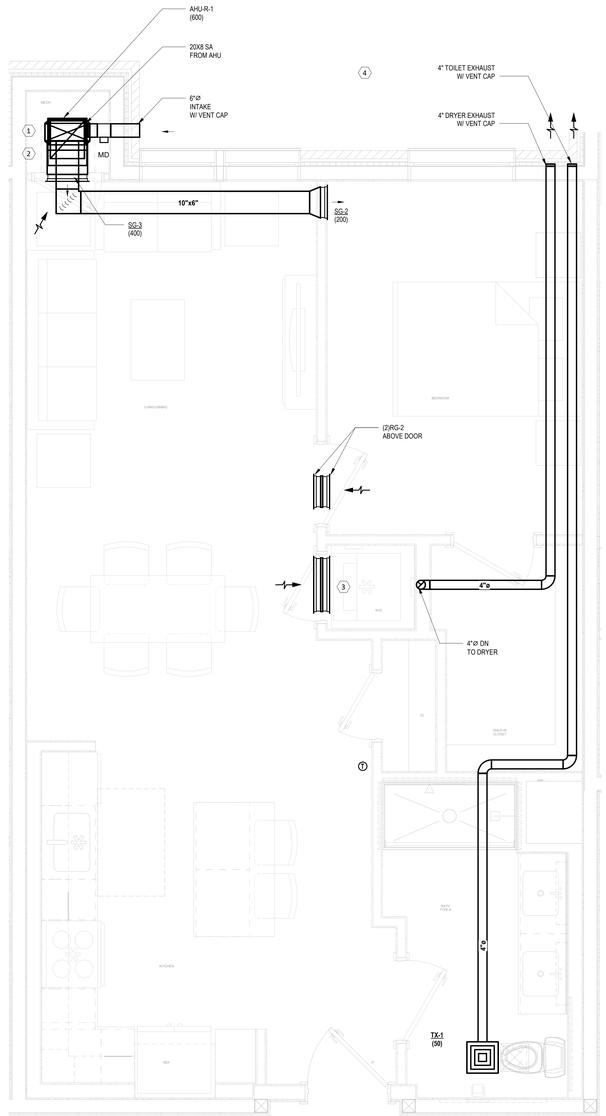
1. DRYER AND EXHAUST TERMINATIONS SHALL BE 3'-0" FROM ANY OPENINGS INTO BUILDINGS INCLUDING BUT NOT LIMITED TO WINDOWS AND 10'-0" FROM MECHANICAL FRESH AIR INTAKES.
2. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL 4" DIA RIGID DUCT FROM DRYER TO EXTERIOR HOOD VENT.
3. CONTRACTOR SHALL ROUTE EXHAUST DUCT TO TERMINATION POINTS ON EXTERIOR PROVIDED BY ARCHITECT. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS.
4. CONTRACTOR SHALL COORDINATE ALL DUCTWORK ROUTING WITH STRUCTURE PRIOR TO FABRICATION.

MECHANICAL KEY NOTES

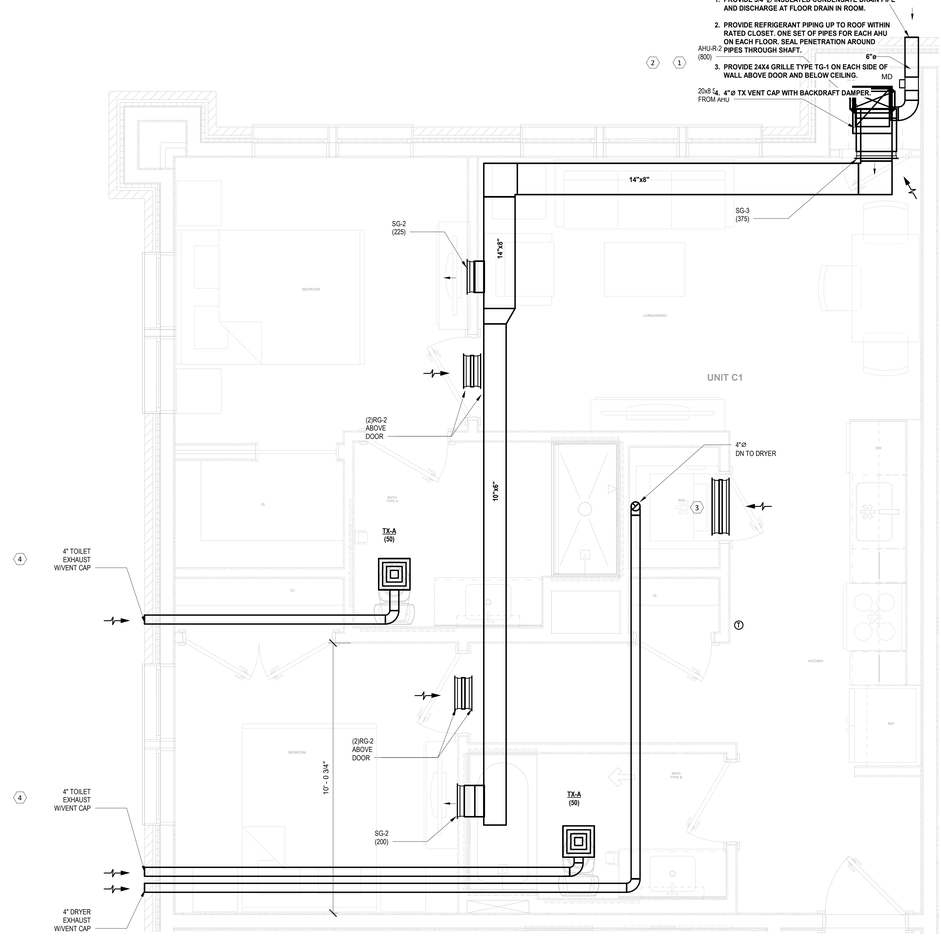
1. PROVIDE 3/4"Ø INSULATED CONDENSATE DRAIN PIPE AND DISCHARGE AT FLOOR DRAIN IN ROOM.
2. PROVIDE REFRIGERANT PIPING UP TO ROOF WITHIN RATED CLOSET. ONE SET OF PIPES FOR EACH AHU ON EACH FLOOR. SEAL PENETRATION AROUND PIPES THROUGH SHAFT.
3. PROVIDE 24X4 GRILLE TYPE TG-1 ON EACH SIDE OF WALL ABOVE DOOR AND BELOW CEILING.
4. 4"Ø TX VENT CAP WITH BACKDRAFT DAMPER.



1 UNIT S1
1/2" = 1'-0"



2 UNIT A1
1/2" = 1'-0"



3 UNIT C1
1/2" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

MECHANICAL TYPICAL UNIT PLANS

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

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ELECTRIC CABINET UNIT HEATERS

DESIGNATION	LOCATION	MBH	KW	CFM	VOLTAGE	PHASE	HZ	AMPS	DIMENSIONS			MANUFACTURER/MODEL	REMARKS
									WIDTH (INCHES)	DEPTH (INCHES)	HEIGHT (INCHES)		
ECUH-A	SEE PLANS	6	1.8	100	120	1	60	15	15.75	5	20	BERKO - FRA1812F	PROVIDE SURFACE FRAME, MM FRASM
ECUH-B	SEE PLANS	34	10	500	208	3	60	35.1	46	9	25	MARKEL - 6346D10	

NOTES:
1. PROVIDE MANUFACTURER'S THERMOSTAT WITH TAMPERPROOF (SECURITY FRONT) COVER AND DISCONNECT SWITCH.
2. PROVIDE MANUFACTURER'S MOUNTING FRAME AS NOTED.
3. ALL FINISH COLORS ARE SUBJECT TO APPROVAL BY THE ARCHITECT. SUBMIT COLOR CHART FOR REVIEW.
4. FOR ALL "WALL MOUNTED" UNITS, MOUNTING HEIGHT SHALL BE AS PER ARCHITECTURAL DRAWINGS. IF NO MOUNTING HEIGHT IS INDICATED ON ARCHITECTURAL DRAWINGS, MOUNT BOTTOM AT 12" AFF.

ELECTRIC UNIT HEATERS

DESIGNATION	TYPE	LOCATION	CFM	HEAT (KW)	AMP	ELECTRICAL SERVICE V/Ø/PH	WIDTH (INCHES)	DEPTH (INCHES)	HEIGHT (INCHES)	APPROX. WEIGHT (LBS)	MANUFACTURER/ MODEL NO.	REMARKS
EUH-A	CEILING HUNG	-	350	5.0	24.0	208/1/60	14	7.5	16	27	QMARK - MUH-05-81	-
EUH-B	CEILING HUNG	-	650	7.5	36.0	208/1/60	19	7.5	21.75	38	QMARK - MUH-07-8	-
												-

NOTES:
1. ARCHITECT TO VERIFY COLOR AND FINISH FOR ALL ELECTRIC HEATERS.
2. PROVIDE WITHBUILT-IN THERMOSTAT (NO BMS CONNECTION).
3. HEAT PURGE FAN DELAY SWITCH.
4. MOUNTING BRACKET AND HARDWARE FOR RECESSED WALL MOUNTED CONFIGURATION.
5. UNIT SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS FOR CLEARANCE AND ACCESS.

FAN SCHEDULE

UNIT No.	SYSTEM TYPE	SERVICE	PERFORMANCE DATA			FAN MOTOR DATA						CONTROL TYPE	WT. (LBS)	MANUFACTURER & MODEL	REMARKS
			CFM	EXT. SP (IN.)	FAN RPM	HP	MOTOR RPM	STARTER TYPE	ELECTRICAL DATA						
									VOLTS	PHASE	HZ				
TRF-A	TRANSFER FAN	GARAGE	2,130	-	4,000	1/2	4,000	-	208	1	60	CO/NOX SENSOR	110	GREENHECK - GJI-26	
GEF-C1-1	EXHAUST	GARAGE LEVEL C1	13,750	0.5	818	5	1,725	VFD	208	3	60	CO/NOX SENSOR	580	GREENHECK BSQ-300	
GEF-1-1	EXHAUST	GARAGE LEVEL 1	4,550	0.65	1,695	2	1,750	VFD	208	3	60	CO/NOX SENSOR	100	GREENHECK AER-20-VG	WALL HOUSING, OSHA GUARD
GEF-1-2	EXHAUST	GARAGE LEVEL 1	4,550	0.65	1,695	2	1,750	VFD	208	3	60	CO/NOX SENSOR	100	GREENHECK AER-20-VG	WALL HOUSING, OSHA GUARD
GSF-1-1	SUPPLY	GARAGE LEVEL 2	13,750	1.0	894	7.5	1,725	VFD	208	3	60	CO/NOX SENSOR	620	GREENHECK BSQ-300	
SPF-1	STAIRWELL 1 PRESSURIZATION	ROOF	8,800	1.0	956	5	1,725	VFD	208	3	60	PRESSURE SENSOR	620	GREENHECK USF-22-VG	
SPF-2	STAIRWELL 2 PRESSURIZATION	ROOF	8,800	1.0	956	5	1,725	VFD	208	3	60	PRESSURE SENSOR	620	GREENHECK USF-22-VG	
EF-1	EXHAUST	TRASH ROOM	1,050	0.9	1318	1/4	1725	-	208	1	60	SCHEDULE - TIME CLOCK	115	GREENHECK / USF-13	ISOLATION BASE, SPRING ISOLATORS
TX-1	EXHAUST	RESIDENTIAL RESTROOMS	50	0.25	1072	7.0 W	-	-	115	1	60	OCCUPANCY SENSOR	39	PANASONIC FV-05-11VK1	
OAF-1	OUTSIDE AIR SUPPLY FAN	SEE PLANS	65	0.5		61 W	-		115	1	60	HP INTERLOCK	6	FANTECH DBF-110	UL-705, 5-STEP TRANSFORMER SPEED CONTROL

NOTES:
1. PROVIDE BACKDRAFT DAMPERS FOR ALL EXHAUST FANS.
2. AMENITY TOILET AND GENERAL EXHAUST FANS SHALL RUN CONTINUOUSLY.
3. PROVIDE MANUFACTURER'S WEATHER HOOD FOR OUTDOOR MOTOR.
4. PROVIDE MANUFACTURER'S VIBRATION ISOLATION SUPPORT FOR ALL OUTDOOR FANS.
5. PROVIDE NEMA-4 FOR ALL OUTDOOR DISCONNECT SWITCHES.

DIFFUSER, REGISTER, & GRILLE SCHEDULE

UNIT TAG	APPLICATION	FACE/SLOTS WxL (IN.)	NECK/INLET (IN.)	CFM RANGE	T.S.P. (IN. W.G.)	NC	MANUFACTURER	MODEL	REMARKS
CD-1	SUPPLY	24x24	6"	0-110	0.07	20	TITUS	OMNI	SEE NOTES
CD-2	SUPPLY	24x24	8"	111-255	0.10	25	TITUS	OMNI	SEE NOTES
CD-3	SUPPLY	24x24	10"	256-350	0.10	30	TITUS	OMNI	SEE NOTES
CD-4	SUPPLY	12x12	8"	0-255	0.10	30	TITUS	OMNI	SEE NOTES
CD-5	SUPPLY	14"⌀	8"	0-175	0.10	30	TITUS	TMR-AA	SEE NOTES
CD-6	SUPPLY	18"⌀	10"	0-300	0.10	30	TITUS	TMR-AA	SEE NOTES
CD-7	SUPPLY	22"⌀	12"	0-400	0.10	30	TITUS	TMR-AA	SEE NOTES
LD-1	SUPPLY	(1) 1"W SLOT		40 CFM/FT	0.10	20	TITUS	FL-10-JT	SEE NOTES
CG-1	SUPPLY	VARIES	VARIES	VARIES	0.07	20	METALFAB	MFSCR_W3	SEE NOTES; SIZE PER MFR.
SG-1	SUPPLY	10x6	-	0-150	0.02	-	TITUS	301RL	SEE NOTES
SG-2	SUPPLY	14x6	-	151-250	0.02	-	TITUS	301RL	SEE NOTES
SG-3	SUPPLY	18x8	-	251-450	0.02	-	TITUS	301RL	SEE NOTES
			-			-			
TG-1	SUPPLY	VARIES	-	VARIES	0.10	-	TITUS	301RL	SEE NOTES
RD-1	RETURN	24x24	8"	111-255	0.10	30	TITUS	OMNI	SEE NOTES
RG-1	RETURN	10X6	-	0-175	0.10	-	TITUS	350 RL	SEE NOTES
RG-2	RETURN	14X6	-	176-250	0.10	-	TITUS	350 RL	SEE NOTES
RG-3	RETURN	18X8	-	251-425	0.10	-	TITUS	350 RL	SEE NOTES
RG-4	RETURN	24X24	-	0-1600	0.10	-	TITUS	350 RL	SEE NOTES
RG-5	RETURN	SEE PLANS	-	0-200	0.10	-	TITUS	350 RL	SEE NOTES
RG-6	RETURN	18"⌀	10"	0-300	0.10	30	TITUS	TMR-AA	SEE NOTES
ED-1	EXHAUST	12x12	6"	VARIES	0.10	25	TITUS	OMNI	SEE NOTES
ED-2	EXHAUST	24x24	8"	VARIES	0.10	25	TITUS	OMNI	SEE NOTES
EG-1	EXHAUST	8X8	-	0-200	0.10	-	TITUS	350RL	SEE NOTES
EG-2	EXHAUST	12x10	-	201-350	0.10	26	TITUS	350RL	SEE NOTES
EG-3	EXHAUST	24x16	-	0-1500	0.10	26	TITUS	350RL	SEE NOTES
EG-4	EXHAUST	36x16	-	0-2200	0.10	35	TITUS	350RL	SEE NOTES
EG-5	EXHAUST	48x18	-	0-3900	0.10	35	TITUS	350RL	SEE NOTES

NOTES:
1. COORDINATE BORDER, FRAME AND FINISH OF AIR OUTLETS WITH ARCHITECT.
2. PROVIDE CORD OPERATED DAMPERS FOR SUPPLY, RETURN, AND EXHAUST DEVICES. IN INACCESSIBLE CEILINGS; PROVIDE CORD CLIP FOR LINEAR DIFFUSERS.
3. PROVIDE RADIATION DAMPER MODEL MSCD, BY METALFAB, FOR UNIT CEILING SUPPLY GRILLES; SIZE PER MANUFACTURER.

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28 PEARL STREET
PORTCHESTER, NY

MECHANICAL SCHEDULES

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

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FILE NAME:

M-301

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AIR HANDLING UNIT SCHEDULE, RESIDENCES (R)

DESIGNATION	LOCATION	SERVICE	COOLING					HEATING			ELECTRICAL DATA							UNIT WEIGHT (LBS)	REFRIG.	SOUND PRESSURE HIGH / LOW (DB)	UNIT DIMENSIONS			FILTER	MANUFACTURER. MODEL #	REMARKS
			TOTAL (MBH)	SENSIBLE (MBH)	CFM	ENT. AIR DB/WB (°F)	LVG. AIR DB/WB (°F)	TOTAL (MBH)	CFM	ELECTRIC HEAT (KW)	EXT. SP (IN. W.G.)	MOTOR (HP)	MCA	VOLTS	PH	HZ	MOCP				WIDTH (IN)	DEPTH (IN)	HEIGHT (IN)			
AHU-R-1	REFER TO PLANS	REFER TO PLANS	18	12.1	600	80/67	56/55	20	600	5.0	0.9	1/2	29.9	208	1	60	30	115	R32	-	17.5	21	45	MERV 8	DAIKIN - FXTA18	MATCH WITH ACCU-R-1
AHU-R-2	REFER TO PLANS	REFER TO PLANS	24	16.5	800	80/67	56/55	27.4	800	6.0	0.9	1/2	36.1	208	1	60	40	115	R32	-	17.5	21	45	MERV 8	DAIKIN - FXTA24	MATCH WITH ACCU-R-2

NOTES:

1. INSTALLATION SHALL ADHERE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND GUIDELINES.
2. PROVIDE ADDITIONAL ACCESSORIES FOR LONG LINE APPLICATION AS REQUIRED BY MANUFACTURER.

AIR-COOLED CONDENSING UNIT - HEAT PUMP - RESIDENCES (R)

CONDENSING UNIT DESIGNATION	LOCATION	TOTAL COOLING (MBH)	TOTAL HEATING (MBH)	CONDENSING UNIT										UNIT DIMENSIONS			WEIGHT (LBS)/ MODULE	SEER2	HSPF2	REFRIG.	SOUND PRESSURE	SOUND PRESSURE	MANUFACTURER	MODEL	REMARKS
				COMPRESSOR				ELECTRICAL DATA																	
				QUANTITY	CAPACITY CONTROL RANGE (%)	FAN TYPE	CFM	VOLTS	PH	HZ	MCA	MOCP		DEPTH (IN)	WIDTH (IN)	HEIGHT (IN)					(DB)	(DB)			
ACCU-R-1	ON ROOF	18	20	1	14 - 100	PROP	3000	208	1	60	16.5	20		12	37	39	172	15.6	8.1	R32	58	74	DAIKIN	RXTA18	
ACCU-R-2	ON ROOF	24	27.4	1	14 - 100	PROP	3000	208	1	60	19.8	20		12	37	39	172	15.6	8.1	R32	58	74	DAIKIN	RXTA24	

NOTES:

1. INSTALLATION SHALL ADHERE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND GUIDELINES.
2. PROVIDE WITH BAFFLE FOR COOLING OPERATION DOWN TO 0 DEGREES F.
3. HEATING OPERATION DOWN TO -4 DEGREES F.
4. MAXIMUM PIPE LENGTH 164 FEET. MAXIMUM PIPE VERTICAL LENGTH 98 FEET.

AIR HANDLING UNIT SCHEDULE, RESIDENCES (R)

DESIGNATION	LOCATION	SERVICE	COOLING					HEATING			ELECTRICAL DATA							UNIT WEIGHT (LBS)	REFRIG.	SOUND PRESSURE HIGH / LOW (DB)	UNIT DIMENSIONS			FILTER	MANUFACTURER. MODEL #	REMARKS
			TOTAL (MBH)	SENSIBLE (MBH)	CFM	ENT. AIR DB/WB (°F)	LVG. AIR DB/WB (°F)	TOTAL (MBH)	CFM	ELECTRIC HEAT (KW)	EXT. SP (IN. W.G.)	MOTOR (HP)	MCA	VOLTS	PH	HZ	MOCP				WIDTH (IN)	DEPTH (IN)	HEIGHT (IN)			
AHU-A-X	REFER TO PLANS	REFER TO PLANS																	R32	-					DAIKIN - FXTA	
																				-						

NOTES:

1. INSTALLATION SHALL ADHERE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND GUIDELINES.
2. PROVIDE ADDITIONAL ACCESSORIES FOR LONG LINE APPLICATION AS REQUIRED BY MANUFACTURER.

AIR-COOLED CONDENSING UNIT - HEAT PUMP - AMENITY (A)

CONDENSING UNIT DESIGNATION	LOCATION	TOTAL COOLING (MBH)	TOTAL HEATING (MBH)	CONDENSING UNIT										UNIT DIMENSIONS			WEIGHT (LBS)/ MODULE	SEER2	HSPF2	REFRIG.	SOUND PRESSURE	SOUND PRESSURE	MANUFACTURER	MODEL	REMARKS
				COMPRESSOR				ELECTRICAL DATA																	
				QUANTITY	CAPACITY CONTROL RANGE (%)	FAN TYPE	CFM	VOLTS	PH	HZ	MCA	MOCP		DEPTH (IN)	WIDTH (IN)	HEIGHT (IN)					(DB)	(DB)			
ACCU-A-X	ON ROOF																			R32			DAIKIN	RXTA	

NOTES:

1. INSTALLATION SHALL ADHERE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND GUIDELINES.
2. PROVIDE WITH BAFFLE FOR COOLING OPERATION DOWN TO 0 DEGREES F.
3. HEATING OPERATION DOWN TO -4 DEGREES F.
4. MAXIMUM PIPE LENGTH 164 FEET. MAXIMUM PIPE VERTICAL LENGTH 98 FEET.

HEAT PUMP SCHEDULE, CORRIDOR (C)

DESIGNATION	LOCATION	SERVICE	COOLING						HEATING		SUPPLY FAN		ELECTRICAL DATA					UNIT WEIGHT (LBS)	UNIT DIMENSIONS			FILTER	MANUFACTURER. MODEL #	REMARKS
			TOTAL (MBH)	SENSIBLE (MBH)	CFM	OA CFM	ENT. AIR DB/WB (°F)	LVG. AIR DB (°F)	TOTAL (MBH)	CFM	EXT. SP (IN. W.G.)	HP	MCA	VOLTS	PH	HZ	MOCP		WIDTH (IN)	DEPTH (IN)	HEIGHT (IN)			
HP-C-A	CORRIDOR CEILING	CORRIDOR FLOOR 2 THROUGH 9	5.8	4.7	300	40	80/67	56/55	6.5	300	-	1/12	0.3	208	1	60	15	34	22	22	10.25	WASHABLE	DAIKIN - FXZQ05TAVJU	-

AIR-COOLED CONDENSING UNIT - HEAT PUMP, CORRIDOR (C)

CONDENSING UNIT DESIGNATION	LOCATION	SERVICE	NOMINAL COOLING (MBH)	NOMINAL HEATING (MBH)	CONDENSING UNIT										UNIT DIMENSIONS			WEIGHT (LBS)/	EER	MANUFACTURER. MODEL #	REMARKS
					COMPRESSOR - PER MODULE					ELECTRICAL DATA					DEPTH (IN)	WIDTH (IN)	HEIGHT (IN)				
					QTY	TYPE	CAPACITY RANGE	FAN TYPE	CFM	VOLTS	PH	HZ	MCA	MOCP							
ACCU-C-1	ROOF	HP-C-A	96	108	1	SCROLL HERMETIC	4%-100%	PROP	8,965	208	3	60	34.1	35	30	48	65	685	12	DAIKIN - RXYQ96AATJB	

NOTES:

1. INDOOR UNIT IS EVAPORATOR ONLY - OUTDOOR UNIT IS CONDENSING UNIT (COMPRESSOR AND CONDENSER).
2. PROVIDE ADDITIONAL ACCESSORIES FOR LONG LINE APPLICATION AS REQUIRED BY MANUFACTURER. VAPOR AND LIQUID LINE SIZES SHALL BE VERIFIED BY MANUFACTURER FOR ACTUAL INSTALLED LENGTH.
3. HEAT PUMP OPERATION DOWN TO -4 DEGREES F AT FULL HEATING CAPACITY.
4. OUTDOOR UNIT SOUND PRESSURE 61 dBA.
5. PROVIDE ALL REQUIRED ACCESSORIES, PIPING AND DEVICES FOR VRV APPLICATION AS PER MANUFACTURER'S REQUIREMENTS.
6. INSTALLATION SHALL ADHERE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND GUIDELINES.
7. INDOOR UNIT WITH INTEGRAL CONDENSATE PUMP CAPABLE OF 24" LIFT.
8. INDEPENDENT MOTORIZED LOUVER OUTLETS, 4/3/2 WAY BLOW CONFIGURABILITY, HIGH EFFICIENCY DC FAN WITH AUTO FAN SPEED CONTROL.
9. STANDARD LIMITED WARRANTY 10 YEARS.
10. CAPABLE OF 98 FEET VERTICAL SEPARATION FOR REFRIGERANT LINES BETWEEN INDOOR AND OUTDOOR UNIT, AND 230 MAXIMUM PIPE LENGTH.

CONDENSATE PUMP SCHEDULE

UNIT No.	LOCATION	SERVICE	TYPE	GPM	TDH (FT)	RECEIVER TANK	RPM	BHP	MOTOR HP	ELECTRICAL DATA				MANUF. MODEL #	REMARKS
										VOLTS	PHASE	HZ	AMPS		
CP-1	AT UNIT	AHUs AND HPs	VERTICAL	2.3	12	1 GALLON	3000	-	1/10	115	1	60	3.5	HARTELL MODEL # AZK-1965	-

NOTES: 1. ALL CONDENSATE PUMPS TO BE PLENUM RATED. 2. PROVIDE FOR ALL AHU AND AC UNITS.

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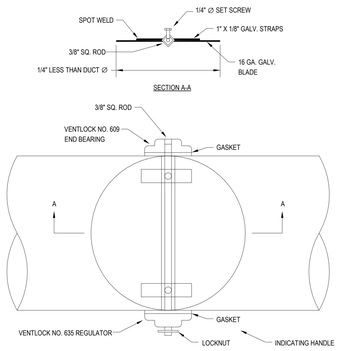
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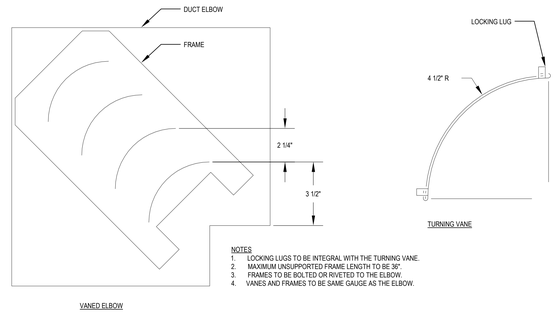
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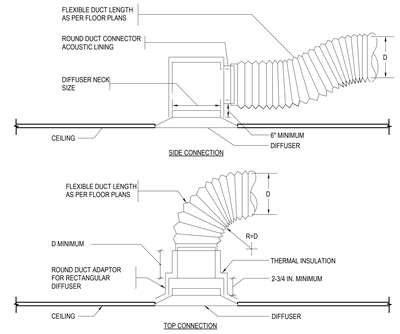
ROUND VOLUME DAMPER - UP TO 14 IN. DIAMETER, LOW PRESSURE

NOT TO SCALE



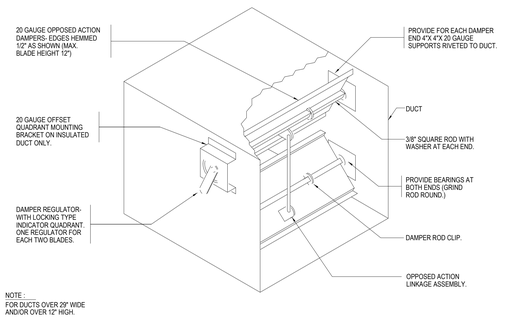
SINGLE THICKNESS TURNING VANES DETAIL

NOT TO SCALE



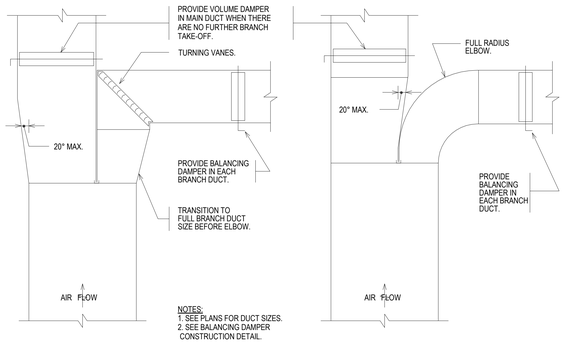
DIFFUSER CONNECTION DETAIL

NOT TO SCALE



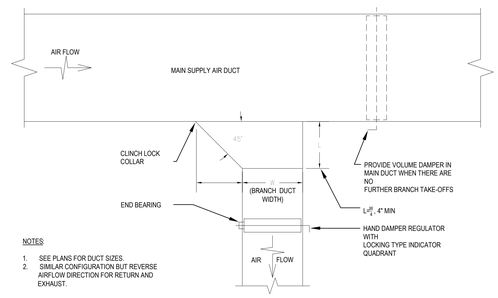
LOW PRESSURE BALANCING DAMPER

NOT TO SCALE



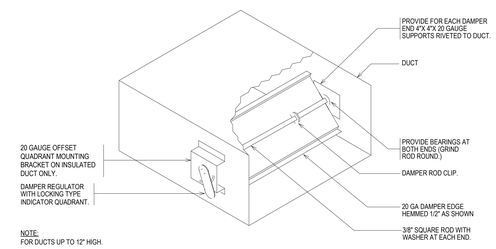
DETAIL OF SUPPLY AIR DUCT NECK CONNECTIONS (WITH VOLUME DAMPERS)

NOT TO SCALE



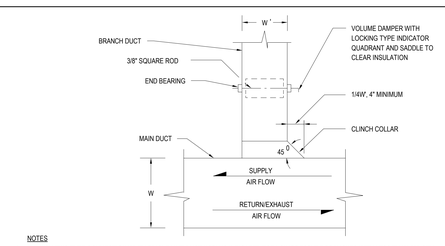
TYPICAL DETAIL OF RECTANGULAR SUPPLY AIR DUCT TAP (WITH VOLUME DAMPER)

NOT TO SCALE



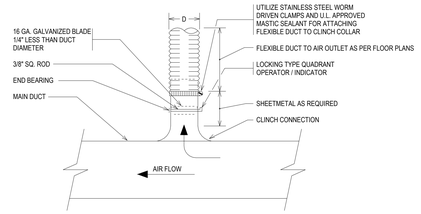
LOW PRESSURE BALANCING DAMPER

NOT TO SCALE



RECTANGULAR DUCT ANGULAR TAP WITH VOLUME DAMPER

NOT TO SCALE



CIRCULAR BRANCH CONNECTION TO SINGLE AIR OUTLET

NOT TO SCALE

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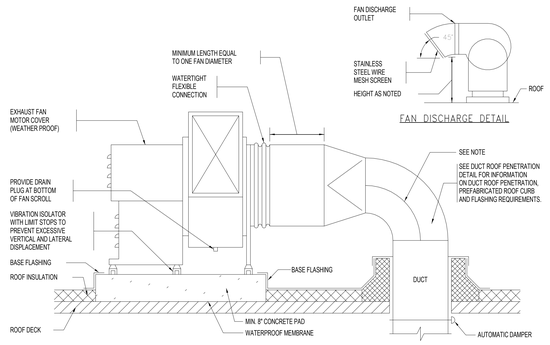
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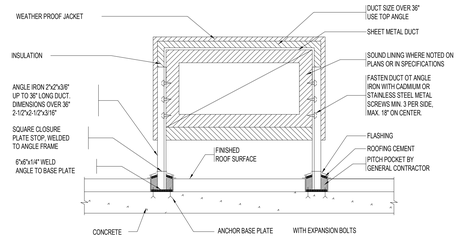
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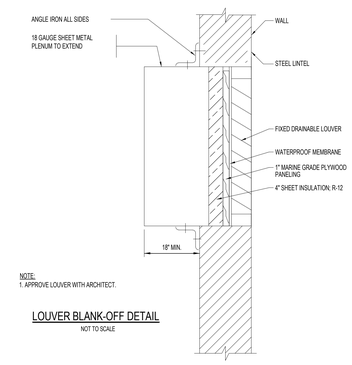
ROOF MOUNTED UTILITY FAN DETAIL

NOT TO SCALE



DETAIL OF SUPPORT FOR ROOF MOUNTED DUCTWORK

NOT TO SCALE

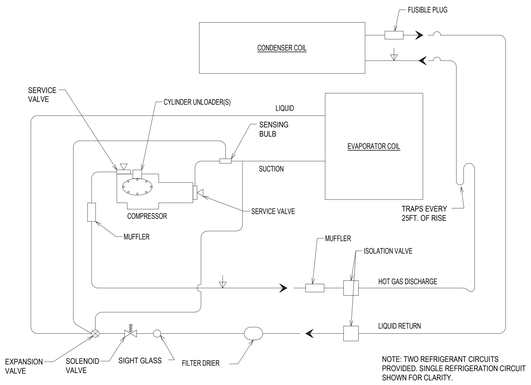


LOUVER BLANK-OFF DETAIL

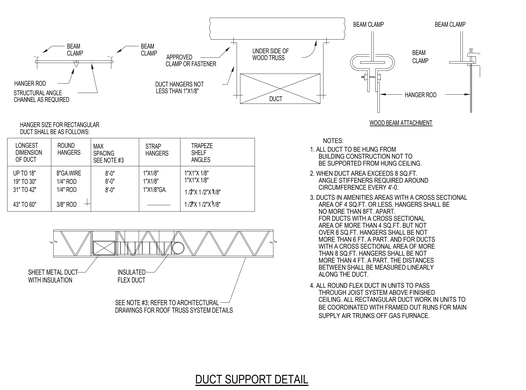
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ROOF MOUNTED EXHAUST FAN DETAIL

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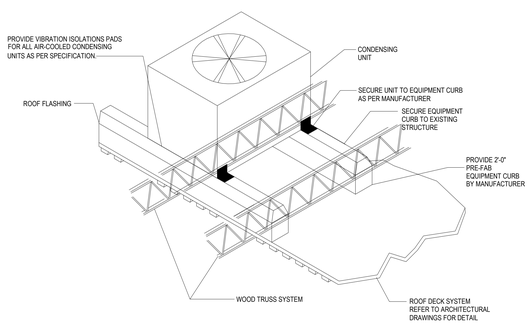


REFRIGERANT PIPING SCHEMATIC



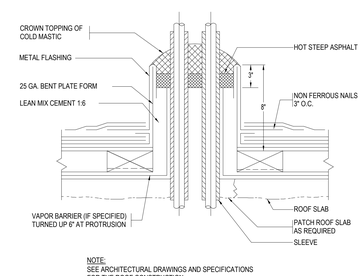
DUCT SUPPORT DETAIL

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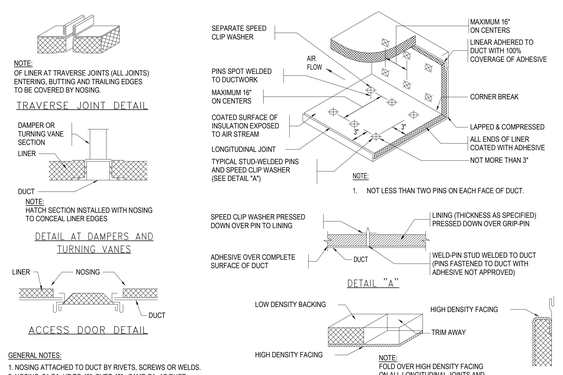
ROOF TOP EQUIPMENT INSTALLATION

NOT TO SCALE



PIPING THROUGH ROOF

NOT TO SCALE



SOUND LINING INSTALLATION AND NOSING DETAIL

NOT TO SCALE

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28 PEARL STREET
PORTCHESTER, NY

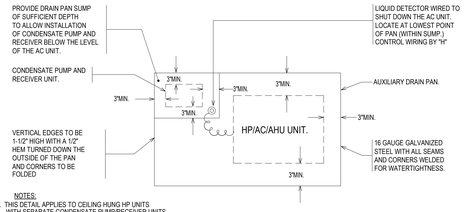
MECHANICAL DETAILS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

PROJECT No: B2R24080
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PLOT DATE: 2/7/2025 12:41:02 PM
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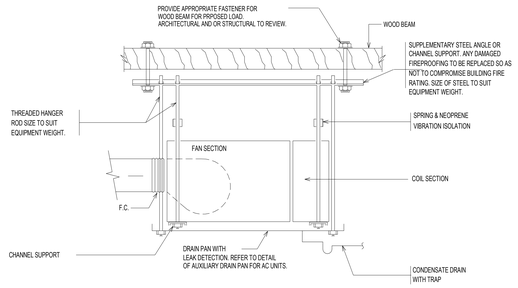


NOTES:

1. THIS DETAIL APPLIES TO CEILING HUNG HP UNITS WITH SEPARATE CONDENSATE PUMP/RECEIVER UNITS.
2. COORDINATE DIMENSIONS OF DRAIN PAN AND SUMP WITH THE ARRANGEMENT AND INSTALLATION REQUIREMENTS OF THE HP UNIT, PUMP AND PIPING.
3. FOR CEILING INSTALLATIONS, SUPPORT HP UNIT, CONDENSATE PUMP/RECEIVER UNIT, AND DRAIN PAN INDEPENDENTLY FROM STRUCTURE OVERHEAD.
4. PROVIDE 3/4" PLUGGED DRAIN AT LOW POINT.
5. PROVIDE UNIT SHUT DOWN WHEN LIQUID IS DETECTED.

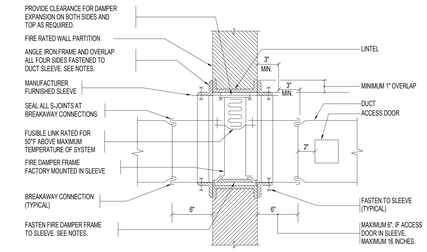
DETAIL OF AUXILIARY DRAIN PAN FOR CEILING HUNG HP UNITS

NOT TO SCALE



HANGING DETAIL HVAC EQUIPMENT

NOT TO SCALE

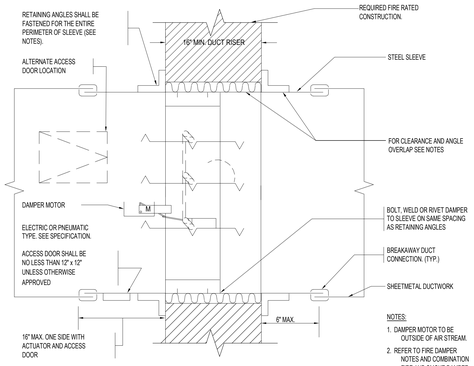


GENERAL NOTES:

1. DAMPER TO BE U.L. LABELED N.F.P.A. 90A, BSA AND MEA APPROVED.
2. N.F.P.A. APPROVED INSTALLATION DETAILS TO BE PART OF SUBMISSION OF FIRE DAMPER FOR APPROVAL, WHICH SHALL MEET N.F.P.A. STANDARD 90A AND SHALL BE BSA APPROVED.
3. DETAILS SHOWN ARE FOR FIRE DAMPERS IN HORIZONTAL DUCTWORK, FOR DAMPERS IN VERTICAL DUCTWORK, DETAILS SIMILAR EXCEPT DAMPERS ARE TO BE SPRING LOADED.
4. ACCESS DOOR IS SHOWN IN SIDE OF DUCT, IF FUSIBLE LINK IS MORE ACCESSIBLE FROM BOTTOM OF DUCT RELOCATE ACCESS DOOR.
5. U.L. APPROVED BREAKAWAY SLIP JOINT CONNECTION SHALL BE USED.
6. THIS DETAIL IS A GUIDE ONLY. INSTALL FIRE DAMPER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UL LISTING.
7. RETAINING ANGLES MUST OVERLAP THE FIRE WALL 1" MIN. AND COVER CORNERS OF OPENINGS.

BRANCH OR MAIN DUCT WITH TYPE "B" FIRE DAMPER

NOT TO SCALE



NOTES:

1. DAMPER MOTOR TO BE OUTSIDE OF AIR STREAM.
2. REFER TO FIRE DAMPER NOTES AND COMBINATION FIRE AND SMOKE DAMPER NOTES.

FIRE DAMPER AND COMBINATION FIRE AND SMOKE DAMPER NOTES

I. FIRE DAMPER
1. FURNISH AND INSTALL A FIRE DAMPER WHERE ON THE DRAWINGS.
2. ALL FIRE DAMPERS SHALL BE RATED TO MAINTAIN THE RATING OF THE FIRE SEPARATION. THEY SHALL BE APPROVED AND LABELED BY UNDERWRITER'S LABORATORIES (U.L.). THE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTRUCTIONS. DAMPERS SHALL BE AS MANUFACTURED BY IMPERIAL DAMPER CO. MODEL # 150 TYPE A,B OR C (MEA # 300-93-M) OR APPROVED EQUAL BY THE ENGINEER.
3. ALL DUCT-SLEEVE CONNECTION SHALL COMPLY WITH UL 555 ASHRAE & SMACNA.
4. CONNECTIONS BETWEEN SLEEVE AND DUCTWORK SHALL BE BREAKAWAY TYPE SUCH AS "S" SLIP, CRIMP. OR OTHER SLIP TYPE IN ACCORDANCE WITH UL 555.
5. FIRE DAMPER SLEEVE SHALL BE OF THICKNESS NOT LESS THAN THAT REQUIRED BY THE STANDARD FOR INSTALLATION OF AIR CONDITIONING SYSTEMS, NFPA 90A (LATEST EDITION).
6. AFTER THE INSTALLATION AT DAMPERS THE CONTRACTOR SHALL SEAL AND TAPE ALL JOINTS FOR AIR TIGHTNESS. SEALANTS USED SHALL BE 3M COMPANY NO. 800, MIRACLE ADHESIVE CORPORATION, OR AS APPROVED AND GRAY VINYL DUCT TAPE AS MANUFACTURED BY NASHUA CORPORATION OR AS APPROVED. BREAKAWAY CONNECTION SHALL BE SEALED PER FIRE DAMPER MANUFACTURER'S RECOMMENDATION.
7. TO ALLOW FOR EXPANSION, DAMPER SHALL HAVE A TOP CLEARANCE EQUIVALENT TO 1/8" FOR EACH FOOT OF DAMPER HEIGHT. THE SIDE CLEARANCE SHALL BE 1/8" FOR EACH FOOT OF DAMPER WIDTH DIVIDED EQUALLY TO THE RIGHT AND LEFT OF THE COLLAR. THE MAXIMUM CLEARANCE FOR THE TOP AND THE TOTAL OF BOTH SIDES SHALL BE 1/2" EACH. THE RETAINING ANGLES SHALL BE 1-1/2"x1-1/2"x14 GAUGE BENT ANGLE SO THAT THERE WILL BE A MINIMUM OF 1" OF OVERLAP ON THE FIRE SEPARATION.
8. DAMPER SHALL BE SECURED TO SLEEVE WITH EITHER 1/2" TACK WELDS, NO. 10 SHEET METAL SCREWS, 1/4" DIA. NUTS AND BOLTS, OR 3/16" STEEL RIVETS ALL ON 8" CENTER.
9. GALVANIZED STEEL RETAINING ANGLES SHALL BE SECURED TO SLEEVE WITH EITHER 1/2" TACK WELDS, NO. 10 SHEETMETAL SCREWS, 1/4" DIA. NUTS AND BOLTS, OR 3/16" STEEL RIVETS, ALL 8" ON CENTER.
10. WHERE THE HUNG CEILING DOES NOT HAVE REMOVABLE TILES AN ACCESS DOOR (FIRE RATED WHERE REQUIRED) SHALL BE FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED IN CEILING NEAR LOCATION OF FIRE DAMPER.
11. ALL DUCT ACCESS DOORS SHALL BE LOCATED SO THAT THERE WILL NOT BE ANY INTERFERENCES FOR MAINTENANCE AND INSPECTION OF DAMPER.

II. COMBINATION FIRE/SMOKE DAMPERS (CFSD):
A. FURNISH & INSTALL COMBINATION FIRE SMOKE DAMPERS WHERE INDICATED ON THE DRAWINGS.
B. DAMPERS ARE TO BE 1 1/2 OR 3 HOUR (AS REQUIRED) UL 555 RATED AND UL 555S CLASSIFICATION FOR C.F.S.D.
C. PROVIDE ELECTRIC OPERATOR FOR EACH CSFD. (SEE SPECIFICATIONS FOR REQUIREMENTS).
D. OPERATION: DAMPER SHALL BE CLOSED UPON RECEIVING A SIGNAL FROM THE FIRE ALARM PANEL AND/OR IN RESPONSE TO LOCAL FIRE/SMOKE SIGNAL. WHEN DAMPER IS CLOSED IN RESPONSE TO SMOKE OR FIRE, A MANUAL OVERRIDE SIGNAL FROM THE FIRE ALARM PANEL SHALL OPEN THE DAMPER IF REQUIRED. DAMPER OPERATION CAPABILITIES ARE TO BE MAINTAINED REGARDLESS OF PRESENCE OF FIRE OR SMOKE CONDITIONS.
E. MANUFACTURER: CSFD IMPERIAL MODEL #770 OR APPROVED EQUAL BY THE ENGINEER.
F. INSTALL DUCT DETECTORS AS INDICATED ON PLANS (FURNISHED BY ELECTRICAL CONTRACTOR). LOCATE DUCT DETECTORS UPSTREAM OF THE DAMPERS IN THE DIRECTION OF AIR FLOW. COORDINATE ALL WORK WITH ELECTRICAL CONTRACTOR.

COMBINATION FIRE AND SMOKE DAMPER DETAIL

NOT TO SCALE

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WARNING:
IT IS A VIOLATION OF NEW YORK EDUCATION LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DRAWING IN ANY WAY. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

28 PEARL STREET
PORTCHESTER, NY

MECHANICAL DETAILS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

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M-403

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PLUMBING PRINCIPALS

1. INSULATE ALL WATER LINES (INCLUDING BUT NOT LIMITED TO: HOT WATER, COLD WATER, HOT WATER RETURN, FILTERED, TRAP PRIMING DISTRIBUTION, HORIZONTAL AND VERTICAL STORM WATER PIPING).
2. WASTE LINES SHALL BE PROPERLY PITCHED TO PREVENT "TRAPPED" WATER. INSTALL WASTE LINE CONNECTIONS WITH LONG RADIUS OR 45° "Y" FITTINGS.
3. RETAIN EXISTING SYSTEM CLEAN OUT CONNECTIONS. PROVIDE NEW CLEAN OUT CONNECTIONS AT THE BASE OF ALL STACKS AND AT ALL CHANGES IN WASTE LINE DIRECTION 45° OR GREATER. PROVIDE PROPER CLEARANCES FOR CLEANOUT USE.
4. WHEN CONNECTING NEW HOT AND COLD WATER LINES TO EXISTING RISERS, CONTRACTORS SHALL LEAVE A PLUGGED VALVED OUTLET FOR FUTURE USE. PLUGGED VALVE OUTLET SHALL BE EQUAL IN SIZE TO THE RISER SIZE OR AS DIRECTED BY THE BUILDING MANAGER.
5. INDIVIDUAL SHUT-OFF VALVES MUST BE SUPPLIED AND INSTALLED FOR EACH NEW FIXTURE, INCLUDING WATER COOLERS.
6. ALL NEW PIPES ARE TO BE SUPPORTED FROM SLAB OR STEEL BEAMS, NOT FROM EXISTING PIPES OR DUCT WORK.
7. PROVIDE FIRE & SMOKE STOPPING FOR ALL PLUMBING PIPING PASSING THROUGH RATED WALLS OR SMOKE PARTITIONS.
8. ALL VALVES ARE TO BE PROPERLY TAGGED.
9. ANY WET COLUMNS USED SHOULD BE PROVIDED WITH A 18" x 18" STEEL SURFACE MOUNTED ACCESS DOOR.
10. THE GENERAL CONTRACTOR SHALL OBTAIN PERMISSION FROM THE BUILDING MANAGEMENT FOR INSTALLATION OF SANITARY PIPING AT THE CEILING OF THE FLOOR BELOW.
11. REFER TO ARCHITECTURAL DRAWING FOR PLUMBING FIXTURE SCHEDULE AND / OR COORDINATE WITH THE BUILDING STANDARDS.
12. ALL EXPOSED P-TRAPS, STOPS, SUPPLIES AND ASSOCIATED PIPING SHALL BE PROVIDED WITH TRAP WRAP.
13. ALL SINKS SHALL BE EQUIPPED WITH THERMOSTATIC MIXING VALVES WHERE HOT WATER TEMPERATURES EXCEED 110 DEG F.
14. ALL EXISTING PLUMBING ASSOCIATED PIPING SHALL BE PROTECTED DURING ALL PHASE OF CONSTRUCTION. PROVIDE LABELING ON ALL EXISTING AND NEW PIPING COLD WATER, SANITARY AND VENT PIPING LOCATED IN THE AREA OF WORK.
15. STRUCTURAL ENGINEERING SHALL SPECIFY TYPES OF ANCHORS/METHODOLOGY TO USE FOR EVERY TYPE OF HANGING LOAD. (SANITARY PIPING, VENT PIPING, AND WATER PIPING.)
16. STRUCTURAL ENGINEERING SHALL REVIEW SUBMITTALS/CUT SHEETS FOR ALL ANCHORS TO BE USED FOR THE PLUMBING PIPING INSTALLATION.
17. THE BUILDING MANAGEMENT SHALL REVIEW A REPORT FROM TENANT STRUCTURAL ENGINEER STATING THEY OBSERVED DURING SITE VISITS THAT ANCHORS WERE INSTALLED IN ACCORDANCE WITH THE SPECIFICATION AND SUBMITTALS.
18. PROVIDE ADEQUATE SUPPORT ON ALL THE EXISTING HORIZONTAL HOT AND COLD WATER BRANCH PIPING LOCATED IN THE CORE TOILETS. (WHERE REQUIRED)
19. PROVIDE CLAMP SUPPORT ON ALL EXISTING VERTICAL SANITARY, VENT, HOT AND COLD WATER PIPING TO MATCH EXISTING. (WHERE REQUIRED)
20. PROVIDE INSULATION ON ALL EXISTING AND NEW HOT AND COLD WATER PIPING LOCATED IN THE AREA OF WORK. (WHERE REQUIRED)

PLUMBING INSTALLATION NOTES

1. PRIOR TO ROUGH-IN OF SYSTEMS EQUIPMENT, COORDINATE WITH THE GENERAL CONTRACTOR, EQUIPMENT SHOP DRAWINGS AND APPLICABLE EQUIPMENT INSTALLER FOR EXACT LOCATION AND WIRING REQUIREMENTS. PROVIDE ALL NECESSARY EQUIPMENT, WIRING AND ACCESSORIES FOR A COMPLETE INSTALLATION. MAKE ALL FINAL CONNECTIONS AS REQUIRED.
2. IF EXACT LOCATION, MOUNTING OR ROUTINGS ARE NOT INDICATED OR ARE NOT CLEAR OR CONFLICT (LOCATION OR HEIGHT) COORDINATE WITH OTHER TRADES AND REQUEST CLARIFICATION PRIOR TO ROUGHING, OR INSTALLATION. DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATION, MOUNTING HEIGHTS OF EQUIPMENT AND ROUTING SHALL BE COORDINATED WITH THE EQUIPMENT REQUIREMENTS AND FIELD CONDITIONS.
3. EQUIPMENT & PIPING INSTALLATION NOT COORDINATED WITH ALL OTHER BUILDING SYSTEMS / BUILDING COMPONENTS WHICH CAUSES INTERFERENCE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
4. VERIFY DIMENSIONS AND CLEARANCES AT BUILDING BEFORE COMMENCING WORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACTUAL LOCATION OF STRUCTURAL MEMBERS AND COORDINATE INSTALLATION OF THE IMPROVEMENTS ACCORDINGLY.
5. CONTRACTOR SHALL INCLUDE PRICING FOR RE-ASSEMBLY OF DISASSEMBLED EQUIPMENT.

PLUMBING RISER TAG LEGEND

P / 1	RISER DESIGNATION / RISER NUMBER	PLUMBING RISER DESIGNATION
G / 1	RISER DESIGNATION / RISER NUMBER	GAS RISER DESIGNATION
L / 1	RISER DESIGNATION / RISER NUMBER	STORM RISER DESIGNATION

PLUMBING GENERAL NOTES

1. ALL REFERENCES HEREIN TO THE CONTRACTOR SHALL REFER TO THE PLUMBING CONTRACTOR UNLESS OTHERWISE NOTED.
2. THE ENTIRE INSTALLATION SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE EXACT LOCATION OF ALL EXISTING PLUMBING SYSTEMS PRIOR TO MAKING NEW CONNECTIONS TO EXISTING LINES. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK WITHIN A DISTANCE OF FIVE FEET FROM THE BUILDING PERIMETER.
5. DO NOT MAKE ANY CHANGES OR SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN APPROVAL FROM THE ARCHITECT OR ENGINEER.
6. THE CONTRACTOR SHALL REFER TO WRITTEN SPECIFICATION IN CONJUNCTION WITH THESE DRAWINGS FOR FULL PROJECT SCOPE.
7. THE CONTRACTOR SHALL PERFORM A HYDRANT FLOW TEST TO VERIFY THE AVAILABLE WATER SUPPLY PRESSURE PRIOR TO ANY PURCHASING OF EQUIPMENT, FABRICATION OR INSTALLATION.
8. ANY DISCREPANCIES OR INADEQUACIES WITHIN BID DOCUMENTS, BETWEEN THESE BID DOCUMENTS AND RELATED HVAC, FIRE PROTECTION, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, INTERIOR DECOR, AND STRUCTURAL BID DOCUMENTS, OR BETWEEN THESE BID DOCUMENTS AND FIELD CONDITIONS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO BID SUBMISSION.
9. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF RECORD "AS BUILT" DRAWINGS INDICATING THE PRECISE LOCATION OF ALL SYSTEMS, EQUIPMENT, CONCEALED OR EMBEDDED PIPING, EXPOSED PIPING, PIPING CONNECTIONS, AND ACCESS PANELS/DOORS. THESE DRAWINGS SHALL INCLUDE ALL CHANGES AND DEVIATIONS FROM CONSTRUCTION DOCUMENTS.
10. THE CONTRACTOR SHALL SCHEDULE ALL WORK TO AVOID INTERFERENCE WITH FIRE PROOFING WORK.
11. PLATFORMS, CURBS, SUMP/EJECTOR PITS, HOUSE TRAP PITS, AND GREASE INTERCEPTOR PITS FOR PLUMBING EQUIPMENT SHALL BE AS INDICATED ON THE STRUCTURAL AND ARCHITECTURAL DRAWINGS UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL COORDINATE EXACT SIZES AND LOCATIONS OF REQUIRED OPENINGS AND SUPPORTS FOR FURNISHED EQUIPMENT.
12. THE CONTRACTOR SHALL COORDINATE ALL UNDERGROUND PIPING LOCATIONS AND INVERTS WITH ALL UTILITIES.
13. THE CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS OF ALL PLUMBING EQUIPMENT WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR. THE CONTRACTOR SHALL FURNISH PLUMBING EQUIPMENT WIRED FOR THE VOLTAGES SHOWN IN CONTRACT DOCUMENTS AND COORDINATED WITH ELECTRICAL CONTRACTOR.
14. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL APPLICABLE CODES. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, TRANSITIONS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
15. THE CONTRACTOR SHALL SUBMIT, PRIOR TO ANY FABRICATION OR INSTALLATION, ALL NECESSARY DRAWINGS, EQUIPMENT/MATERIAL PRODUCT DATA, DOCUMENTATION, AND CALCULATIONS REQUIRED TO COMPLETE THE WORK OUTLINED IN THE CONTRACT DOCUMENTS.
16. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION PRIOR TO ANY FABRICATION OR INSTALLATION. ALL FEES FOR PERMITS AND INSPECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL ABOVE GRADE PIPING SHALL BE PROPERLY SUPPORTED FROM THE BUILDING STRUCTURE. NO PIPING SHALL REST ON CEILING TILES OR CEILING STRUCTURE.
18. ALL EXPOSED HORIZONTAL AND VERTICAL PIPING SHALL BE INSTALLED IN A NEAT ARRANGEMENT AND IN THE MOST INCONSPICUOUS LOCATION POSSIBLE. VERTICAL DROPS SHOULD BE KEPT TO A MINIMUM AND SHOULD BE LOCATED WITHIN CHASES, WALLS, AND SOFFITS WITH OTHER MECHANICAL PIPING AND ELECTRICAL CONDUITS WHEN POSSIBLE. ALL SUCH LOCATION ARE TO BE REVIEWED WITH THE ARCHITECT PRIOR TO INSTALLATION.
19. WATER METER SHALL BE IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS AND SHALL BE PROVIDED WITH REMOTE READING.
20. THE CONTRACTOR SHALL PROVIDE ALL CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS, AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
21. THE CONTRACTOR SHALL COORDINATE ALL ROOF PENETRATIONS AND ASSOCIATED FLASHING REQUIREMENTS WITH OTHER TRADES.
22. THE CONTRACTOR SHALL PROVIDE INSULATION ON ALL COLD WATER, HOT WATER, AND HOT WATER RETICULATION PIPING. THE CONTRACTOR SHALL PROVIDE INSULATION ON ALL HORIZONTAL STORM WATER PIPING.
23. ALL PLUMBING FIXTURES/APPLIANCES SHALL HAVE THEIR OWN SHUTOFF VALVES INSTALLED IN AN EASILY ACCESSIBLE AND CONVENIENT LOCATION.
24. THE CONTRACTOR SHALL PROVIDE ACCESS PANELS/DOORS FOR ALL CLEANOUTS, VALVES, AND ANY OTHER EQUIPMENT LOCATED WITHIN WALLS, PARTITIONS, OR CEILINGS THAT REQUIRE ACCESS FOR MAINTENANCE AND/OR OPERATION.
25. THE CONTRACTOR SHALL INSTALL TRAP SEAL PRIMERS ON ALL FLOOR UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PROVIDE NECESSARY COLD WATER CONNECTION TO ALL TRAP SEAL PRIMERS.
26. SUDS PRESSURE ZONE REQUIREMENTS SHALL BE MEET IN THE DESIGN OF THE SANITARY, WASTE, AND VENT SYSTEMS. NO CONNECTION SHALL BE MADE TO THE VERTICAL PORTION OF A SANITARY OR WASTE STACK WITHIN FORTY STACK DIAMETERS OF THE BASE FITTING. NO CONNECTION SHALL BE MADE TO THE HORIZONTAL OFFSET PORTION OF A SANITARY OR WASTE STACK WITHIN TEN STACK DIAMETERS OF THE BASE FITTINGS.
27. THE CONTRACTOR SHALL PROVIDE REDUCING FITTING AT ALL CHANGES IN DIAMETER OF SANITARY, WASTE, AND STORM PIPING.
28. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SERVICE CONNECTIONS TO ALL EQUIPMENT AND FIXTURE INDICATED ON THE ARCHITECTURAL AND PLUMBING DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SERVICE CONNECTIONS TO HVAC AND FIRE PROTECTION EQUIPMENT.
29. GAS METER ASSEMBLIES INCLUDING VALVES, PIPING, VENTS, AND ALL APPURTENANCES SHALL BE IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS
30. ALL GAS SHUTOFF VALVES ARE TO BE LOCATED IN NONCONCEALED SPACES.
31. THE CONTRACTOR SHALL MAKE THE FINAL CONNECTION TO ALL GAS FIRED EQUIPMENT/APPLIANCES, REGARDLESS OF WHO PROVIDED THE EQUIPMENT/APPLIANCE. THIS SHALL INCLUDE BUT NOT BE LIMITED TO HVAC EQUIPMENT, COOKING EQUIPMENT/APPLIANCES, EMERGENCY GENERATORS, AND DOMESTIC HOT WATER HEATERS. EACH PIECE OF EQUIPMENT/APPLIANCE SHALL BE PROVIDED WITH A DIRT LEG, LUBRICATED PLUG VALVE, UNION, AND PRESSURE REGULATOR (WHERE REQUIRED).

PLUMBING SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

S	SANITARY/SOIL PIPING
W	WASTE PIPING
IW	INDIRECT WASTE PIPING
ED	EJECTOR PUMP DISCHARGE PIPING
SD	SUMP PUMP DISCHARGE PIPING
GW	GARAGE WASTE PIPING
ST	STORM WATER PIPING
	VENT PIPING
	DOMESTIC COLD WATER PIPING
	DOMESTIC HOT WATER PIPING
	DOMESTIC HOT WATER RECIRCULATION PIPING
G	NATURAL GAS PIPING
	ARROW REPRESENTS DIRECTION OF FLOW
	PIPING WITH FREEZE PROTECTION CABLE UNDER INSULATION
	BURIED SANITARY/SOIL, WASTE, VENT, OR STORM PIPING
	PIPE BREAK
	CAPPED OUTLET
	CLEANOUT / PLUGGED OUTLET
	FRESH AIR INLET
	CLEANOUT DECK PLATE
	P-TRAP
	HOSE BIBB
	PIPE DROP / DOWN
	PIPE RISE / UP
	PIPE BOTTOM CONNECTION
	PIPE TOP CONNECTION
	PIPE SIDE CONNECTION
	VACUUM BREAKER
	SHOCK ARRESTOR
	DRAIN
	HOUSE TRAP
	PUMP
	VENT THROUGH ROOF
	WATERPROOF SLEEVE
	PRESSURE GAUGE
	TEMPERATURE GAUGE
T	TAMPER SWITCH
F	FLOW SWITCH
P	PRESSURE SWITCH
	CHECK VALVE
	BALL VALVE
	GATE VALVE
	PLUG VALVE
	MIXING VALVE
	OUTSIDE SCREW & YOKE VALVE
	PRESSURE REDUCING VALVE
	SOLENOID VALVE
	GAS PRESSURE REGULATOR
	WALL HYDRANT
	POINT OF DISCONNECTION FROM EXISTING PIPING
	POINT OF CONNECTION TO EXISTING PIPING

NEW YORK STATE CODES & STANDARDS

- 2020 BUILDING CODE OF NEW YORK STATE
- 2020 FIRE CODE OF NEW YORK STATE
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE
- 2020 FUEL GAS CODE OF NEW YORK STATE
- 2020 NYS UNIFORM CODE SUPPLEMENT
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL
- ALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

NEW YORK STATE ENERGY CODES

- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2016 ASHRAE 90.1
- 2020 SUPPLEMENT TO THE NEW YORK STATE ENERGY CONSERVATION CODE

LOCAL CODES

- PORTCHESTER MUNICIPAL CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2016 NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- 2016 NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
- 2016 NFPA 20 - STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE FOR PROTECTION.
- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE
- 2016 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE

PLUMBING ABBREVIATIONS

(NOT ALL ABBREVIATIONS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

BLDG	BUILDING
CODP	CLEANOUT DECKPLATE
CLG	CEILING
CONN	CONNECT / CONNECTION
CONT	CONTINUE / CONTINUATION
CV	CHECK VALVE
CW	DOMESTIC COLD WATER
DIA	DIAMETER
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER
DCV	DOUBLE CHECK VALVE BACKFLOW PREVENTER
DN	DOWN (PENETRATES FLOOR SLAB)
DR	DRAIN
DW	DISHWASHER
DWG	DRAWING
EX	EXISTING
F	FIRE SERVICE
FD	FLOOR DRAIN
FL	FLOOR
FU	FIXTURE UNIT(S)
G	GAS
GV	GATE VALVE
GAL	GALLONS
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
GW	GARAGE WASTE
HB	HOSE BIBB
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RECIRCULATION
IW	INDIRECT WASTE
JS	JANITOR'S SINK
LAV	LAVATORY
LB	LAUNDRY BOX
MB	MANUFACTURED BY
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OS&Y	OUTSIDE SCREW & YOKE VALVE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH - GAUGE
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
S	SANITARY/SOIL
SPDR	STANDPIPE DRAIN
SH	SHOWER
SK	SINK
SQFT	SQUARE FEET
ST	STORM
TS	TAMPER SWITCH
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UP	UP (PENETRATES FLOOR SLAB)
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VTR	VENT THROUGH ROOF
W	WASTE
WC	WATER CLOSET
WH	WALL HYDRANT

PLUMBING SHEET LIST

SHEET NUMBER	SHEET NAME
P-001	PLUMBING COVER SHEET
P-100	PLUMBING FOUNDATION PLAN
P-101	PLUMBING CELLAR 2 & CELLAR 1 FLOOR PLAN
P-102	PLUMBING FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN
P-103	PLUMBING 2ND & TYPICAL (3RD-7TH) FLOOR PLAN
P-104	PLUMBING 8TH & 9TH FLOOR PLAN
P-105	PLUMBING BUILDING ROOF & PENTHOUSE ROOF PLAN
P-201	PLUMBING TYPICAL UNIT PLANS
P-601	PLUMBING FIXTURE & EQUIPMENT SCHEDULES
P-701	PLUMBING DETAILS
P-702	PLUMBING DETAILS
P-703	PLUMBING DETAILS

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28 PEARL STREET
PORTCHESTER, NY

PLUMBING COVER SHEET

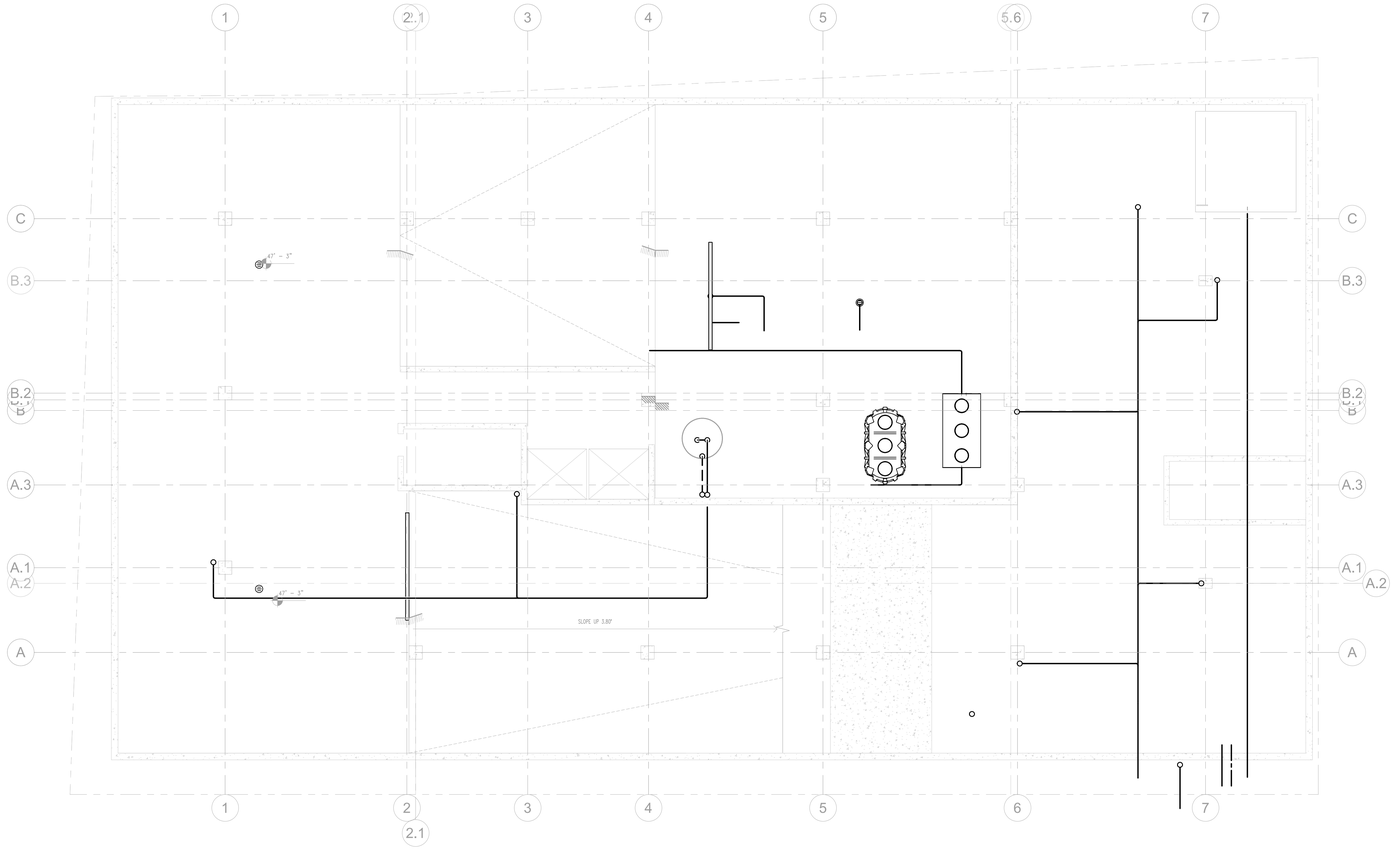
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	25% DD SUBMISSION	12/13/24

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P-001

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1 PLUMBING FOUNDATION PLAN
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PORTCHESTER, NY

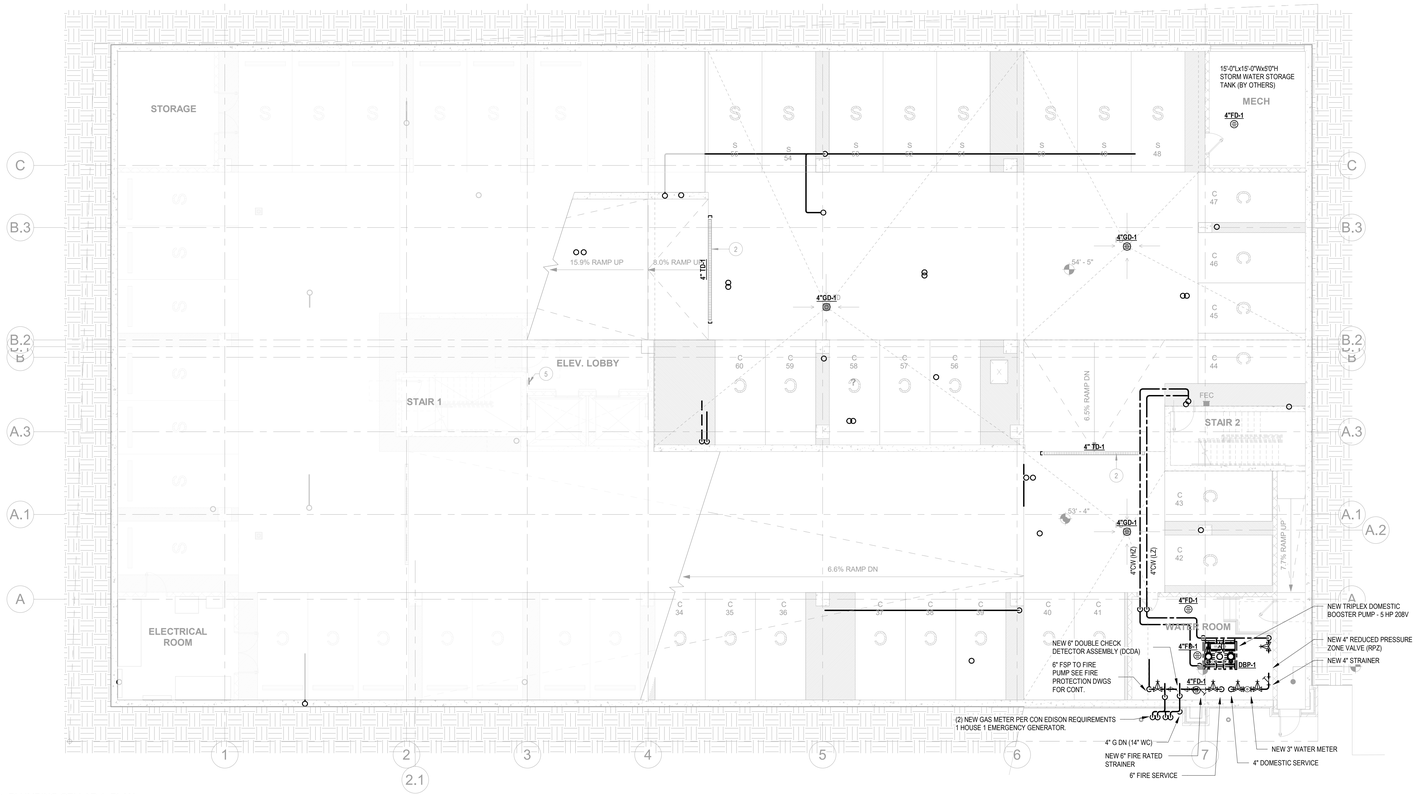
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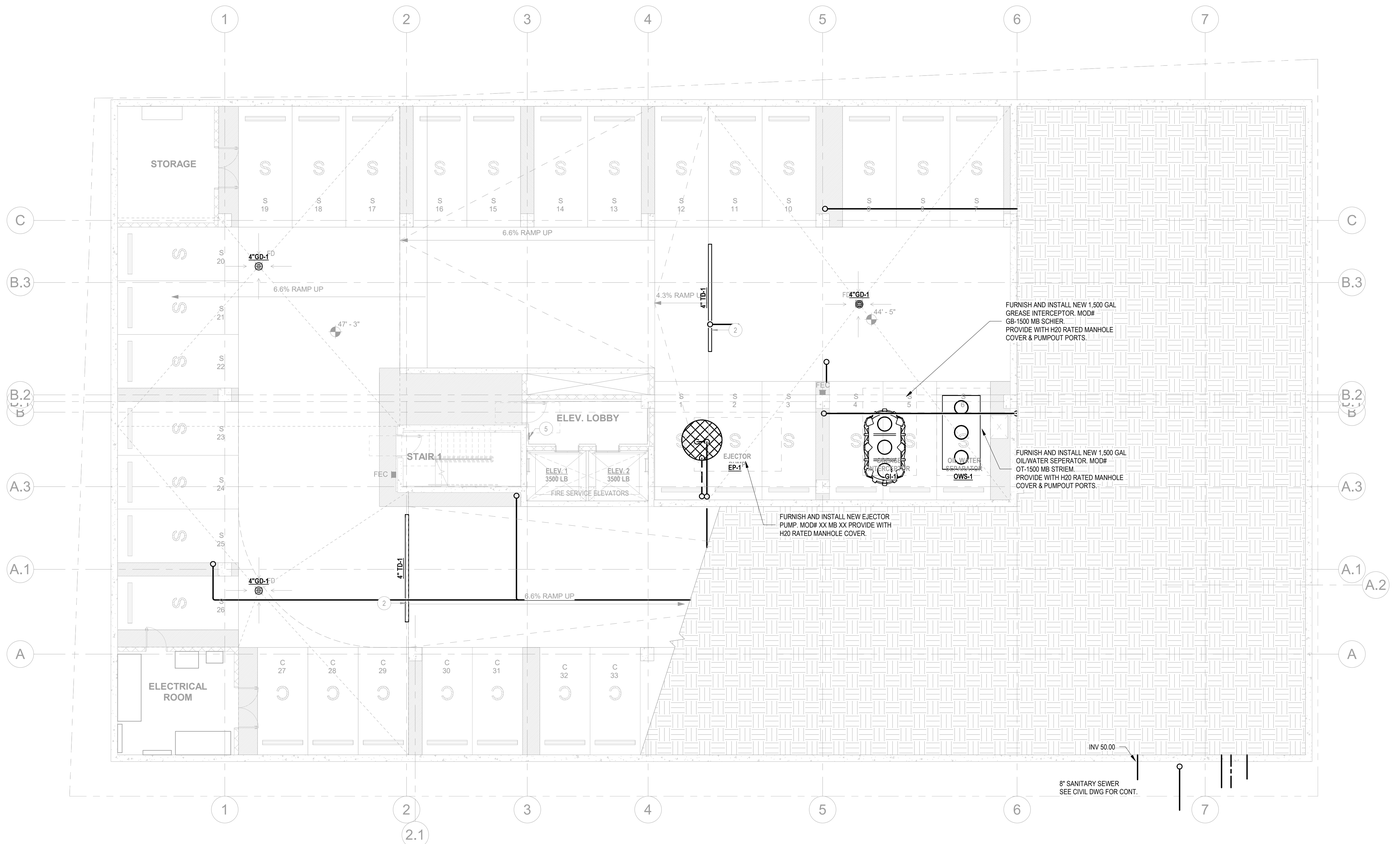
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FILE NAME:	

P-100

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1 PLUMBING CELLAR 1 PLAN
1/8" = 1'-0"



2 PLUMBING CELLAR 2 PLAN
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PLUMBING CELLAR 2 & CELLAR 1 FLOOR PLAN

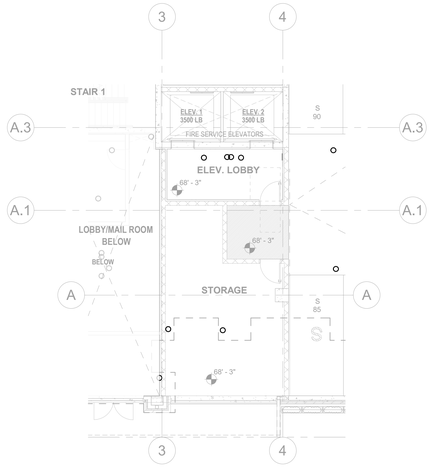
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P-101

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2 FIRST FLOOR UPPER ELEVATOR LOBBY & STORAGE PLAN
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1 PLUMBING 1ST FLOOR PLAN
1/8" = 1'-0"

PROJECT NORTH

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PORTCHESTER, NY

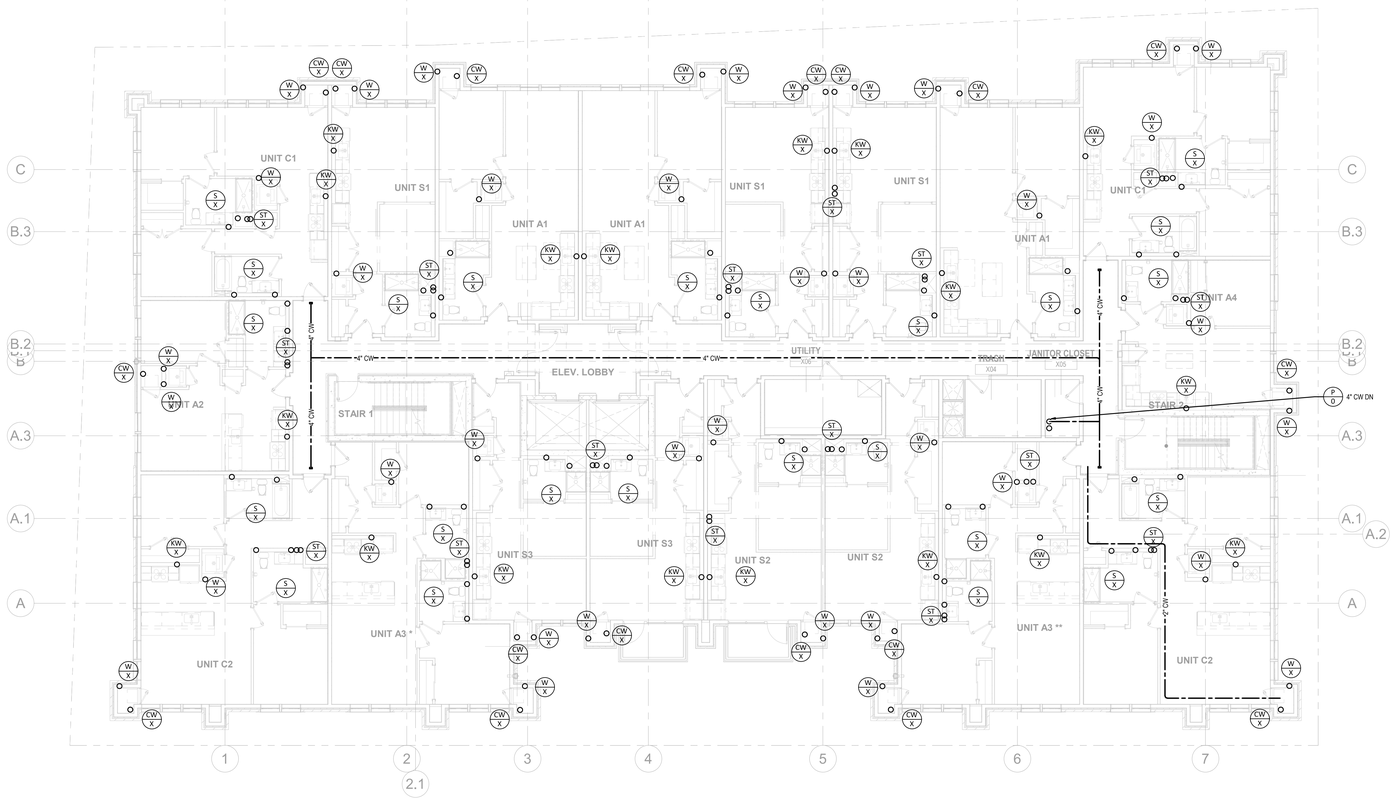
PLUMBING FIRST FLOOR & UPPER ELEVATOR LOBBY PLAN

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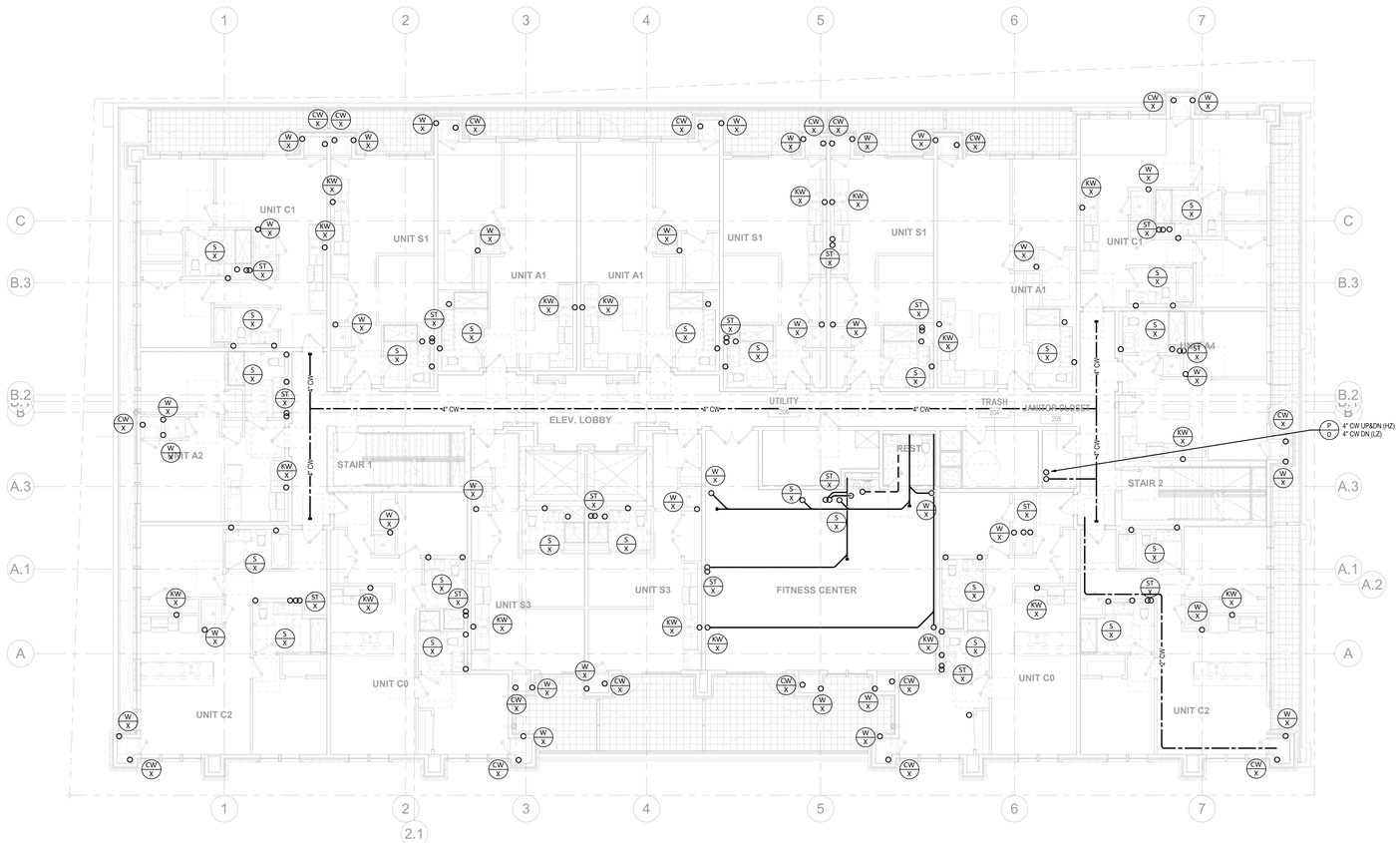
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1 PLUMBING 3RD-7TH FLOOR PLAN
1/8" = 1'-0"



2 PLUMBING 2ND FLOOR PLAN
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PLUMBING 2ND & TYPICAL (3RD-7TH) FLOOR PLAN

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	25% DD SUBMISSION	12/13/24

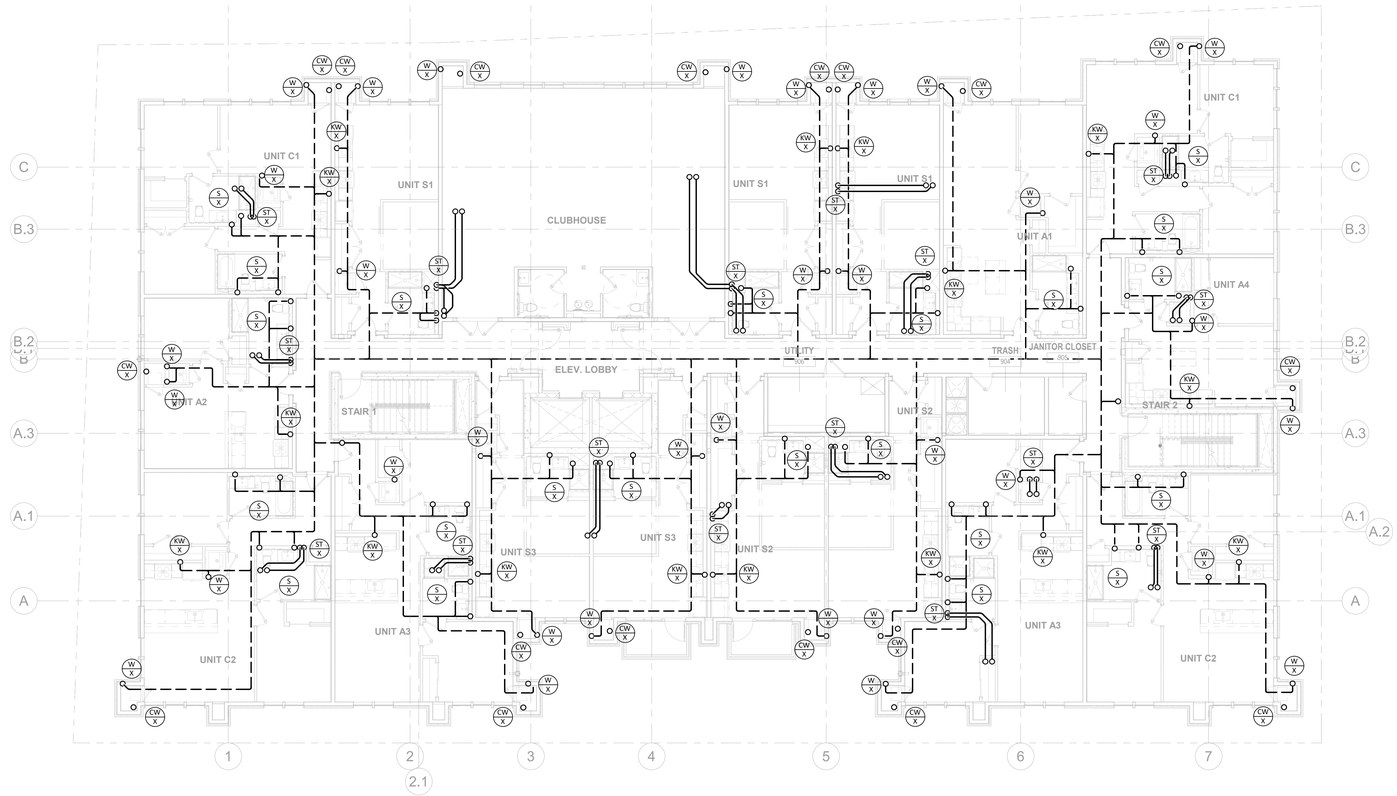
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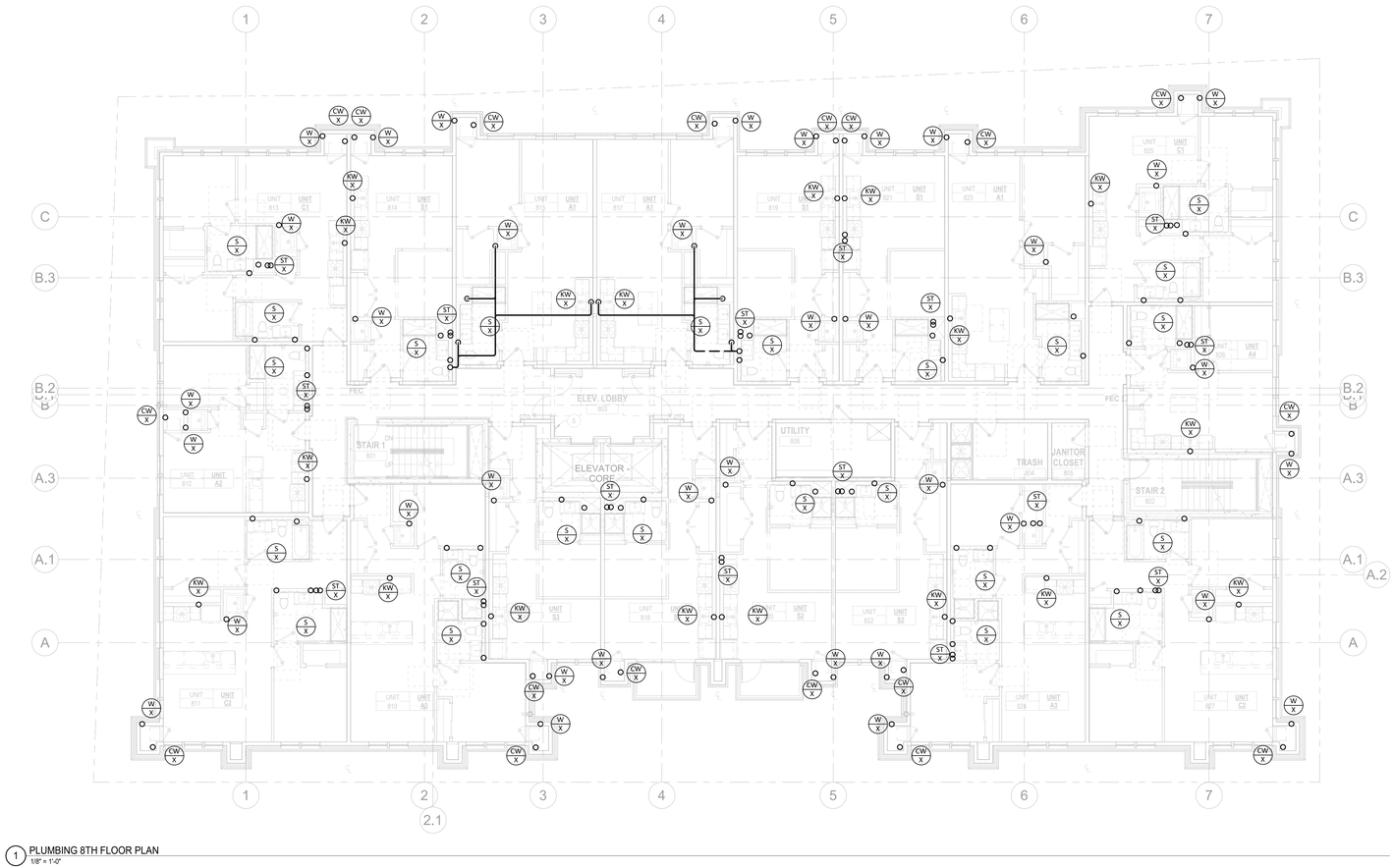
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2 PLUMBING 9TH FLOOR PLAN
1/8" = 1'-0"



1 PLUMBING 8TH FLOOR PLAN
1/8" = 1'-0"

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PLUMBING 8TH & 9TH FLOOR PLAN

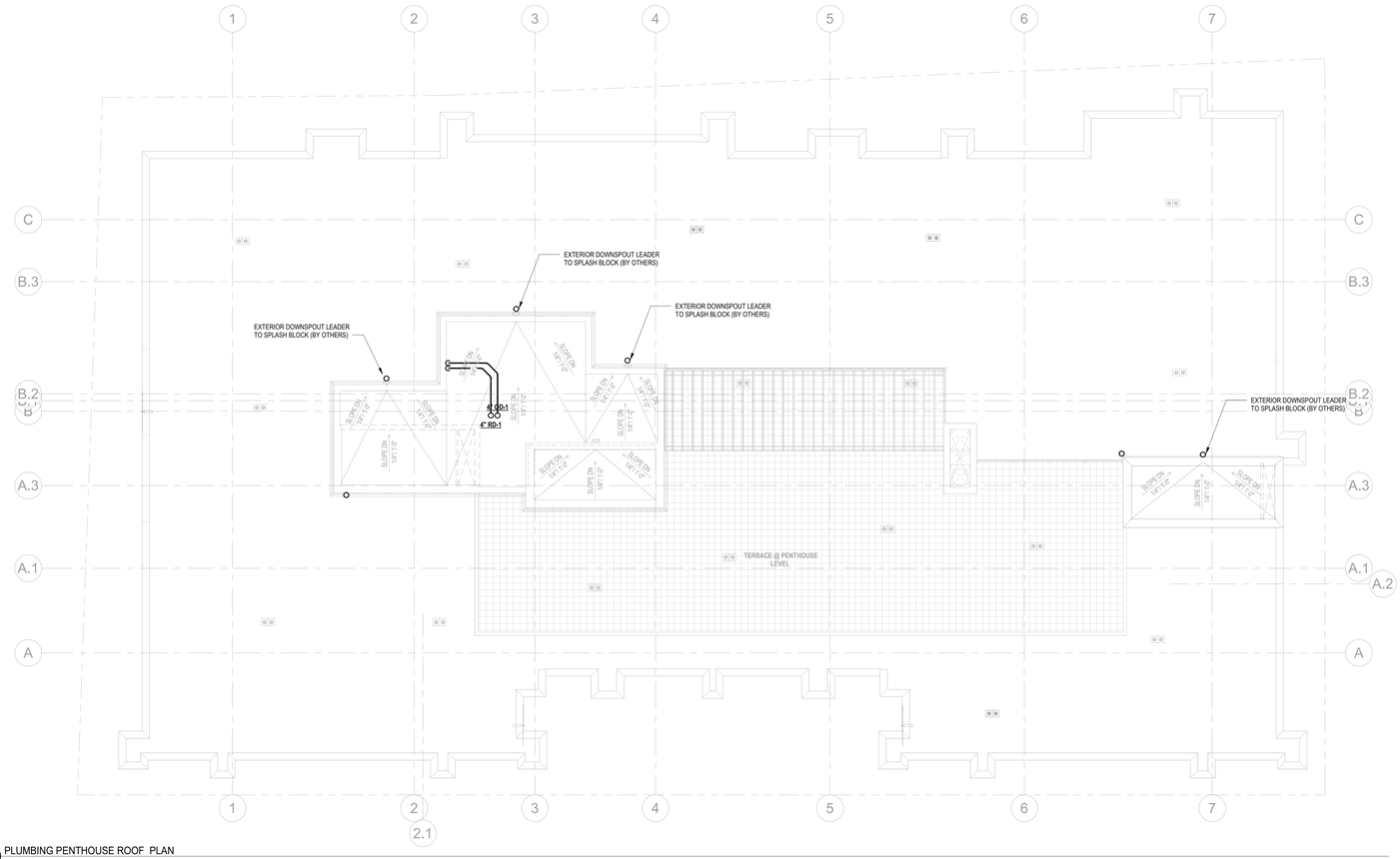
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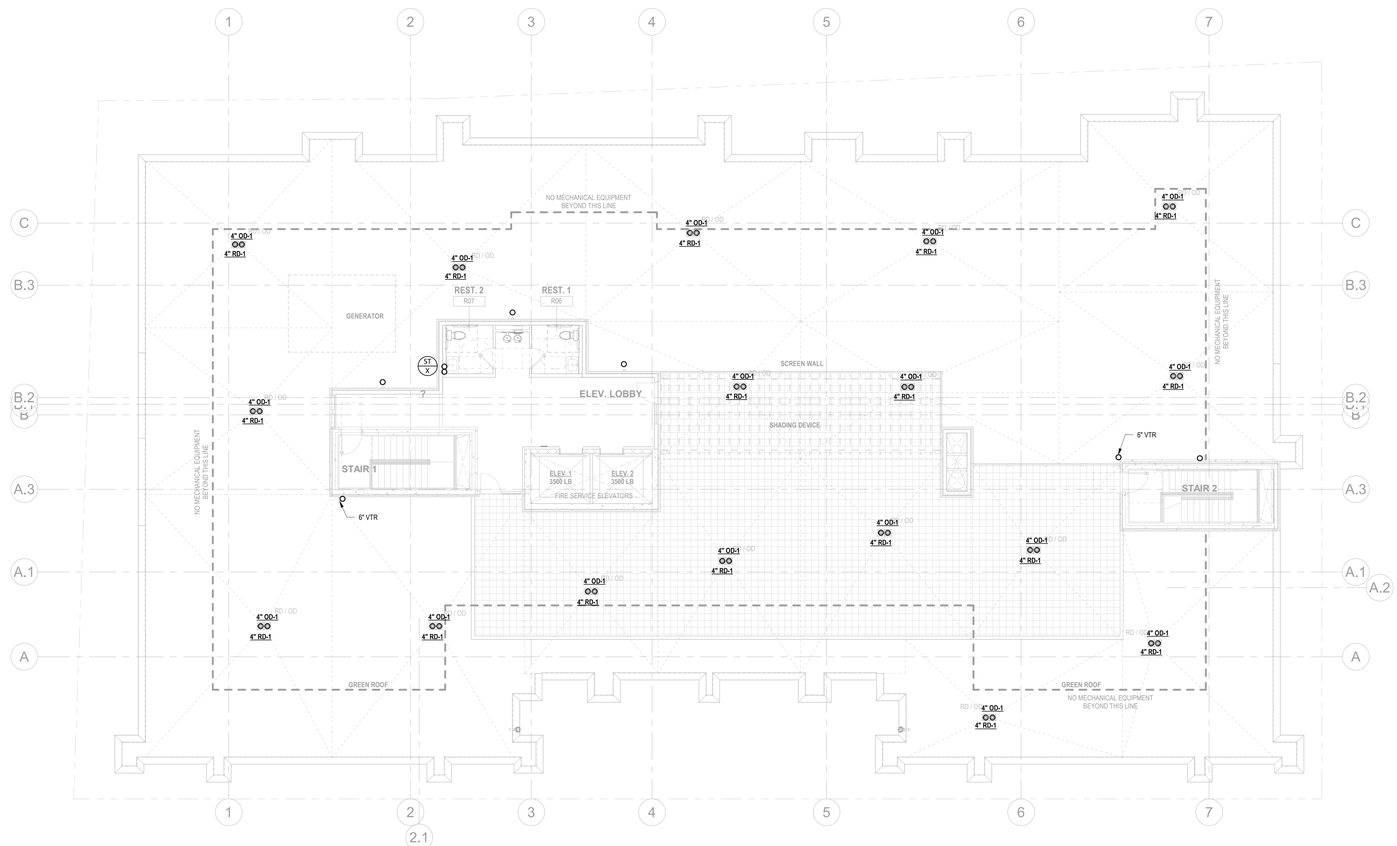
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2 PLUMBING PENTHOUSE ROOF PLAN
1/8" = 1'-0"



1 PLUMBING BUILDING ROOF PLAN
1/8" = 1'-0"

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PLUMBING BUILDING ROOF & PENTHOUSE ROOF PLAN

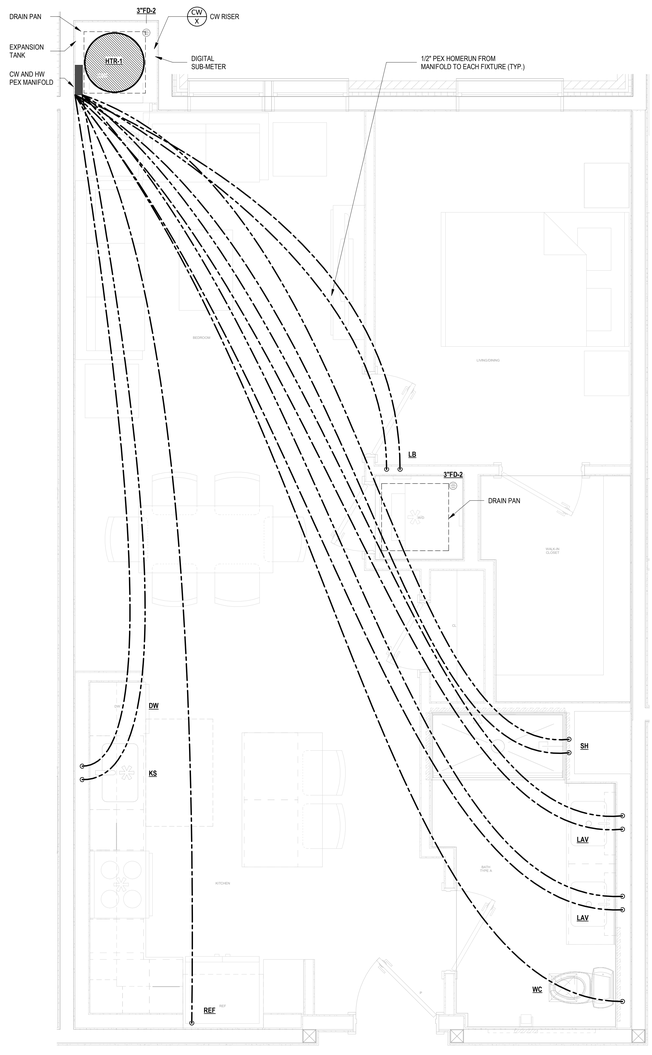
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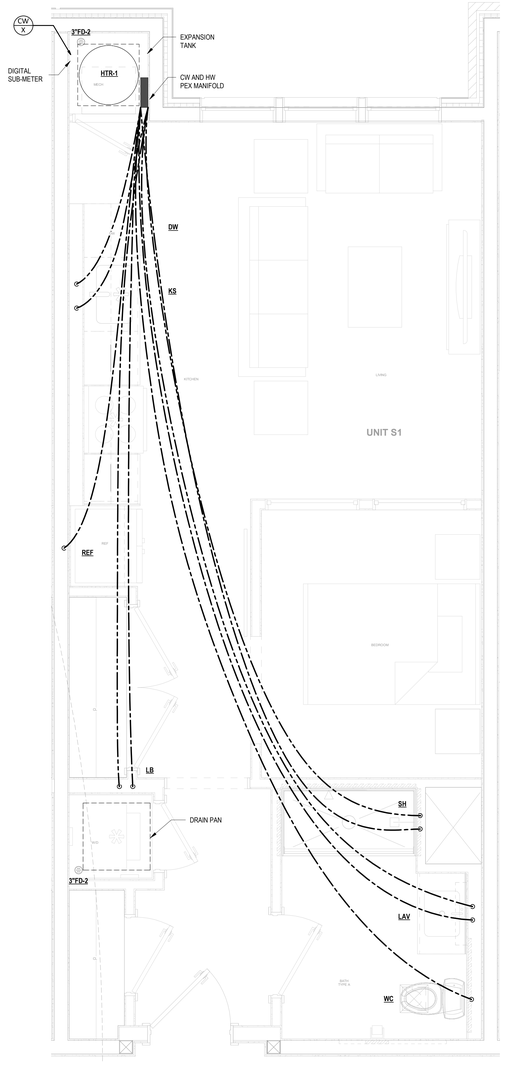
P-105

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1 UNIT C1
1/2" = 1'-0"





2 UNIT A1
1/2" = 1'-0"

3 UNIT S1
1/2" = 1'-0"

PLUMBING UNIT EQUIPMENT NOTES

FURNISH AND INSTALL NEW ELECTRIC 50 GAL LOWBOY WATER HEATER. (HTR-1). LOCATE WATER HEATER WITHIN MECHANICAL CLOSET BELOW HVAC FURNACE. COORDINATE LOCATION OF WATER HEATER WITH ARCHITECT. PROVIDE DRAIN PAN UNDER WATER HEATER. P&T TO SPILL INDIRECTLY WITH AIR GAP TO ADJACENT FLOOR DRAIN. FURNISH & INSTALL COLD & HOT WATER PEX MANIFOLD, EXPANSION TANK, & ALL ASSOCIATED PIPING TO EACH PLUMBING FIXTURE. COORDINATE WITH EXISTING STRUCTURE AND OTHER TRADES TO AVOID CONFLICTS. REFER TO WATER HEATER SCHEDULE FOR MORE INFORMATION.

PLUMBING UNIT DISTRIBUTION NOTES:

1. HOT WATER AND COLD WATER MANIFOLDS SHALL BE SIZED IN ACCORDANCE WITH THE MAXIMUM GALLONS PER MINUTE OF ALL OUTLETS SUPPLIED.
2. INDIVIDUAL FIXTURE SHUTOFF VALVES INSTALLED AT THE MANIFOLD SHALL BE IDENTIFIED AS TO THE FIXTURE BEING SUPPLIED.
3. ACCESS SHALL BE PROVIDED TO MANIFOLDS WITH INTEGRAL FACTORY - OR FIELD INSTALLED VALVES.
4. JOINTS BETWEEN CROSS-LINKED POLYETHYLENE PLASTIC TUBING AND FITTINGS SHALL COMPLY WITH ONE OF THE FOLLOWING:
   A. FLARED PIPE ENDS SHALL BE MADE BY A TOOL DESIGNED FOR THAT OPERATION.
   B. MECHANICAL JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. FITTINGS FOR CROSS-LINKED POLYETHYLENE PLASTIC TUBING SHALL COMPLY WITH THE APPLICABLE STANDARDS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PEX TUBING SHALL BE FACTORY MARKED WITH THE APPROPRIATE STANDARDS FOR THE FITTINGS THAT THE PEX MANUFACTURER SPECIFIES FOR USE WITH THE TUBING.
   C. PUSH-FIT JOINTS SHALL CONFORM TO ASSE 1061 AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
5. REFER TO ARCHITECTURAL UNIT PLANS FOR ADDITIONAL TYPICAL UNIT PLANS. CONNECTIONS FROM PEX MANIFOLD TO PLUMBING FIXTURES SHALL BE INSTALLED AS SPECIFIED INTERNATIONAL AND LOCAL STATE CODES. REFER TO PLUMBING SCHEDULES FOR ALL EQUIPMENT CONNECTIONS.
6. CONTRACTOR SHALL PROVIDE CW & HW PIPING FROM MIXING VALVE TO SHOWER HEAD. CONFIRM SHOWER HEAD LOCATION.

PLUMBING UNIT FIXTURE TAG NOTES - WATER

WC FURNISH & INSTALL NEW WATER CLOSET WITH 1/2" CW, PIPE CONNECTIONS. PROVIDE NEW WATER HAMMER ARRESTOR, NEW SHUT-OFF VALVES SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

LAV FURNISH & INSTALL NEW LAVATORY WITH 1/2" CW, & 1/2" HW PIPE CONNECTIONS. PROVIDE ANTI-SCALD MIXING VALVE TO ENSURE TEMPERATURES DO NOT EXCEED 110 DEG F. PROVIDE NEW WATER HAMMER ARRESTOR, NEW SHUT-OFF VALVES SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

SH/TUB FURNISH & INSTALL NEW SHOWER/TUB WITH 1/2" CW, & 1/2" HW PIPE CONNECTIONS. PROVIDE NEW WATER HAMMER ARRESTOR, NEW SHUT-OFF VALVES SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

LB FURNISH & INSTALL NEW LAUNDRY BOX WITH 1/2" CW, & 1/2" HW PIPE CONNECTIONS. PROVIDE NEW WATER HAMMER ARRESTOR, NEW SHUT-OFF VALVES SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

KS FURNISH & INSTALL NEW KITCHEN SINK WITH 1/2" CW, & 1/2" HW PIPE CONNECTIONS. ROUTE 3/4" HW TO ADJACENT DISHWASHER. PROVIDE NEW WATER HAMMER ARRESTOR, NEW SHUT-OFF VALVES SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

PLUMBING UNIT FIXTURE TAG NOTES - DRAINAGE

WC FURNISH & INSTALL NEW WATER CLOSET WITH 4" SANITARY PIPE CONNECTION. WATER CLOSET SHALL BE WET VENTED FROM ASSOCIATED LAV SINK. SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

LAV FURNISH & INSTALL NEW LAVATORY WITH 2" WASTE & 1-1/2" VENT PIPE CONNECTIONS. PROVIDE WITH P-TRAP, & DRAIN BODY. LAV SINK SHALL ACT AS VENT FOR ASSOCIATED WATER CLOSET & SHOWER WITHIN BATHROOM GROUP. SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

SH/TUB FURNISH & INSTALL NEW SHOWER/TUB WITH 2" SANITARY & 1-1/2" VENT PIPE CONNECTIONS. SHOWER SHALL BE WET VENTED FROM ASSOCIATED LAV SINK, SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

LB FURNISH & INSTALL NEW LAUNDRY BOX WITH 3" WASTE & 2" VENT PIPE CONNECTIONS. PROVIDE WITH P-TRAP & INSTALL PRIOR TO CONNECT TO ASSOCIATED 3" W RISER. SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

KS FURNISH & INSTALL NEW KITCHEN SINK WITH 2" KITCHEN WASTE (GREASE) & 1-1/2" VENT PIPE CONNECTIONS. PROVIDE WITH P-TRAP, & DRAIN BODY. SEE ARCHITECT PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION.

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28 PEARL STREET
PORTCHESTER, NY

PLUMBING TYPICAL UNIT PLANS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
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P-201

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PIPE FITTING AND JOINT MATERIAL SCHEDULE

PIPING SYSTEM	PIPING LOCATION	PIPING SIZE	PIPING SPECIFICATION	FITTING SPECIFICATION	JOINT SPECIFICATION
SANITARY/WASTE	BELOW GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
	ABOVE GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
VENT	BELOW GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
	ABOVE GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
STORM	BELOW GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
	ABOVE GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
INDIRECT WASTE	ABOVE GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
EJECTOR PUMP DISCHARGE/ SUMP PUMP DISCHARGE	ABOVE GROUND	ALL	SCHEDULE 40 FOAM-CORE POLYVINYL CHLORIDE (PVC)	SCHEDULE 40 POLYVINYL CHLORIDE (PVC) WITH SOLVENT CEMENT WELD END	SOLVENT CEMENT WELDED
COLD WATER/HOT WATER/ HOT WATER RECIRCULATION	BELOW GROUND	ALL	CEMENT LINED DUCTILE IRON	CEMENT LINED DUCTILE IRON WITH MECHANICAL JOINT ENDS	BOLT-ON MECHANICAL JOINT WITH HIGH QUALITY NEOPRENE RUBBER COMPRESSION GASKET
	ABOVE GROUND MAIN DISTRIBUTION	ALL	CHLORINATED POLYVINYL CHLORIDE (CPVC)	CHLORINATED POLYVINYL CHLORIDE (CPVC) WITH SOLVENT CEMENT WELD ENDS	SOLVENT CEMENT WELDED
	ABOVE GROUND DWELLING UNIT DISTRIBUTION	ALL	CROSSLINKED POLYETHYLENE TUBING (PEX-C)	BRASS WITH BARBED ENDS	PINCHLOCK CLAMPS
GAS	ABOVE GROUND INSIDE BUILDING	1-1/2" & SMALLER	CORRUGATED STAINLESS STEEL TUBING	BRASS WITH THREADED ENDS	THREADED
		2" & LARGER	SCHEDULE 40 BLACK STEEL	MALLEABLE IRON WITH THREADED ENDS	THREADED

PLUMBING DRAIN SCHEDULE

			DRAIN BODY SPECIFICATION									STRAINER SPECIFICATION																	
DESIGNATION	MANUFACTURER	MODEL NUMBER	BRONZE	CAST IRON	GALVANIZED	STAINLESS STEEL	CLAMPING DEVICE	SECONDARY CLAMP	SUMP RECEIVER	ACID RESISTANT COATING	TRAP PRIMER CONNECTION	BRONZE	CAST IRON	GALVANIZED	NICKEL BRONZE	STAINLESS STEEL	CHROME PLATED	POLISHED FINISH	SATIN FINISH	SECONDARY STRAINER	SEDIMENT BUCKET	LESS GRATE	HALF GRATE	FLUSH GRATE	TRACTOR GRATE	FLAT TOP	FUNNEL TOP	DOME	EXTENSION	ADJUSTABLE	APPLICABLE AREAS
FD-1	JAY R. SMITH	2310		●							●		●																●	MECHANICAL ROOMS,
FD-2	JAY R. SMITH	2010		●							●				●														●	GANG BATHROOM, CLASSROOMS, TRASH
FD-3	JAY R. SMITH	3510		●						●					●											●				MECH CONDENSATE, ELEVATOR SUMP DISCHARGE,
FS-1	JAY R. SMITH	3151								●											●		●							BAR
RD-1	JAY R. SMITH	1015		●			●				●		●														●			FLAT ROOF AREAS
OD-1	JAY R. SMITH	1070		●			●						●														●			FLAT ROOF AREAS

NOTES:

1. ALL FLOOR DRAINS IN FINISHED AREAS AND ALL ROOF DRAINS SHALL BE LOCATED AS PER THE ARCHITECTURAL DRAWINGS.
2. ALL FLOOR DRAINS IN MECHANICAL EQUIPMENT ROOMS, BOILER ROOMS, FAN ROOMS ETC., SHALL BE LOCATED IN COORDINATION WITH THE MECHANICAL CONTRACTOR.
3. THE CONTRACTOR SHALL VERIFY THE COMPATIBILITY OF THE DRAINS WITH THE APPROVED ROOFING AND/OR WATER PROOFING SYSTEMS PRIOR TO SUBMITTING SHOP DRAWINGS.
4. THE TOP OF ALL FLOOR DRAINS SHALL BE FLUSH WITH THE ADJACENT FINISHED FLOOR.
5. PROVIDE MECHANICAL SEAL TRAP GUARDS ON ALL FLOOR DRAINS UNLESS OTHERWISE NOTED.

PLUMBING PUMP SCHEDULE

							CAPACITY (EACH PUMP)		ELECTRICAL DATA (EACH PUMP)					PUMP SYSTEM SPECIFICATION		
SERVICE	DESIGNATION	QUANTITY	SIMPLEX SYSTEM	DUPLEX SYSTEM	TRIPLEX SYSTEM	EMERGENCY POWER	FLOW RATE	HEAD	HP	RPM	V	PH	HZ	MANUFACTURER	MODEL NUMBER	REMARKS
DOMESTIC BOOSTER PUMP	DBP-1	1			●	●	125 GPM	101 FT	5	3600	208	3	60	SYNCROFLOW	240TES40BP-GAF	PROVIDE 90 GAL HYDROPNEUMATIC TANK MOD# WX-405-C MB AMTROL
ELEVATOR PIT SUMP PUMP	ESP-1	1	●			●	100 GPM	25 FT	1	1750	120	1	60	STANCOR	SB-10 O/M ELV	PROVIDE STANCOR SIMPLEX OIL-MINDER CONTROLS

PLUMBING WATER HEATER SCHEDULE

								ELECTRICAL DATA				GAS DATA							
DESIGNATION	MANUFACTURER	MODEL NUMBER	QUANTITY	WATER STORAGE TEMPERATURE (°F)	WATER STORAGE CAPACITY (GAL)	RECOVERY RATE (GPH)	TEMPERATURE RISE (°F)	SINGLE ELEMENT LOAD (KW)	DUAL ELEMENT LOAD (KW)	VOLTAGE	PHASE	NATURAL GAS	PROPANE	FUEL OIL	DUAL FUEL	LOAD (CFH)	MINIMUM OPERATING PRESSURE (IN W.C)	GAS SERVICE CONNECTION (IN)	APPLICABLE AREAS
HTR-1																			
HTR-2	CHRONOMITE	M-20L/208	X	N/A	N/A	20	80	4.160	N/A	208	1								OUTDOOR AMENITY SINK
HTR-3	CHRONOMITE	M-40/208	X	N/A	N/A	20	80	8.320	N/A	208	1								TRASH CHUTE

PLUMBING OPENING / SLEEVE SCHEDULE

INSULATED DOMESTIC COLD WATER, HOT WATER, AND HOT WATER RECIRCULATION PIPING		
PIPE DIAMETER	WALL / FLOOR SLEEVE DIAMETER	BEAM OPENING DIAMETER
1/2" & 3/4"	3"	4"
1"	4"	4 1/2"
1 1/4"	4"	5"
1 1/2"	4"	5"
2" & 2 1/2"	5"	6"
3"	6"	6 1/2"
UNINSULATED SANITARY, WASTE, VENT, STORM, AND GAS PIPING		
PIPE DIAMETER	WALL / FLOOR SLEEVE DIAMETER	BEAM OPENING DIAMETER
1 1/2"	3"	3"
2"	4"	3 1/2"
2 1/2"	4"	4"
3"	5"	4 1/2"
4"	6"	5 1/2"
5"	8"	6 1/2"
6"	8"	7 1/2"

PLUMBING FIXTURE CONNECTION SCHEDULE

FIXTURE	S	W	IW	V	CW	HW
WATER CLOSET (FLUSH VALVE)	4"			2"	1 1/2"	
WATER CLOSET (FLUSH TANK)	4"			2"	1/2"	
URINAL (FLUSH VALVE)	2"			1 1/2"	1"	
LAVATORY		1 1/2"		1 1/2"	1/2"	1/2"
SHOWER		2"		1 1/2"	1/2"	1/2"
SINK		2"		1 1/2"	1/2"	1/2"
LAUNDRY BOX		2"		1 1/2"	1/2"	1/2"
DRINKING FOUNTAIN		1 1/2"		1 1/2"	1/2"	
JANITOR'S SINK		3"		2"	3/4"	3/4"

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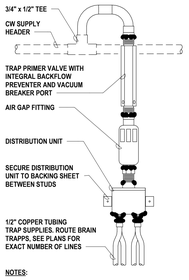
PLUMBING FIXTURE & EQUIPMENT SCHEDULES

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

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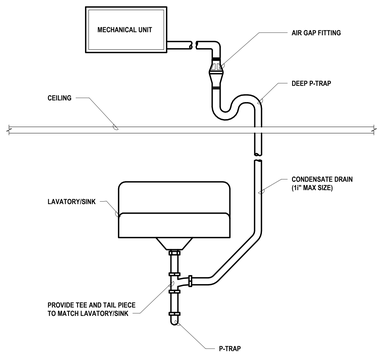


NOTES:

1. MOUNT THE TRAP PRIMER VALVE ONE FOOD ABOVE THE FINISHED FLOOR FOR EVERY 20 FEET OF PRIMER LINE.
2. INSTALL TRAP PRIMER WITHIN WALL BEHIND ACCEESS DOOR.

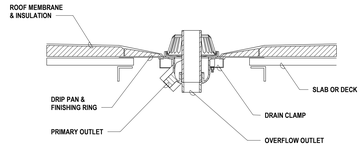
TRAP PRIMER DETAIL (PL)1

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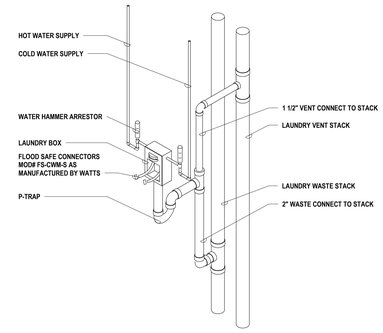
PLUMBING - CONDENSATE DRAIN TO LAVATORY/SINK DETAIL

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PLUMBING - ROOF DRAIN DETAIL

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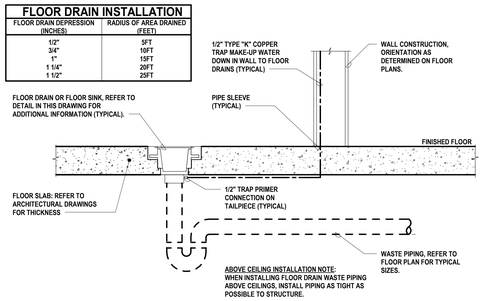


PLUMBING - LAUNDRY UNIT DETAIL

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FLOOR DRAIN INSTALLATION

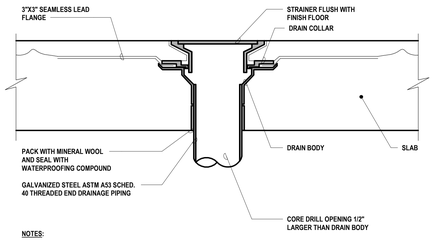
FLOOR DRAIN DEPRESSION (INCHES)	RADIUS OF AREA DRAINED (FEET)
1/2"	5FT
3/4"	10FT
1"	15FT
1 1/4"	20FT
1 1/2"	25FT



ABOVE CEILING INSTALLATION NOTE:
WHEN INSTALLING FLOOR DRAIN WASTE PIPING ABOVE CEILINGS, INSTALL PIPING AS TIGHT AS POSSIBLE TO STRUCTURE.

TYPICAL FLOOR DRAIN DETAIL (PL)

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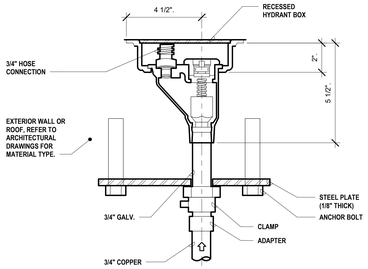


NOTES:

1. WATERPROOF EXISTING FLOOR OF ROOM WHERE FLOOR DRAIN IS TO BE LOCATED USING THOROSEAL SEALANT OR APPROVED EQUAL.

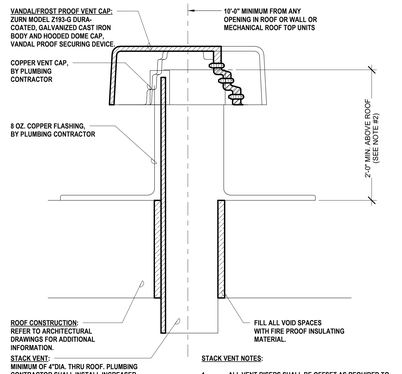
TYPICAL FLOOR DRAIN INSTALLATION DETAIL (PL)

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TYPICAL FREEZE PROOF RECESSED WALL HYDRANT DETAIL (PL)

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STACK VENT NOTES:

1. ALL VENT RISERS SHALL BE OFFSET AS REQUIRED TO CLEAR ROOF STRUCTURE, DUCTWORK, OR MECHANICAL EQUIPMENT ON ROOF. PLUMBING CONTRACTOR SHALL COORDINATE FINAL VENT RISER LOCATIONS WITH OTHER TRADES WORK IN THE FIELD.
2. THE MINIMUM TERMINATION HEIGHT MUST BE DETERMINED BY THE LOCAL AUTHORITY HAVING JURISDICTION BASED ON ITS SNOWFALL RATES. THE TERMINAL HEIGHT SHOULD BE NO LESS THAN 6 INCHES ABOVE THE ROOF TO PROTECT THE TERMINAL FROM BEING BLOCKED BY SNOW AND ALLOW SUFFICIENT LENGTH OF PIPE FOR PROPER ROOF FLASHING.

TYPICAL VENT STACK FLASHING DETAIL FLAT ROOF INSTALLATION (PL)

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PLUMBING DETAILS

NO.	DESCRIPTION	DATE
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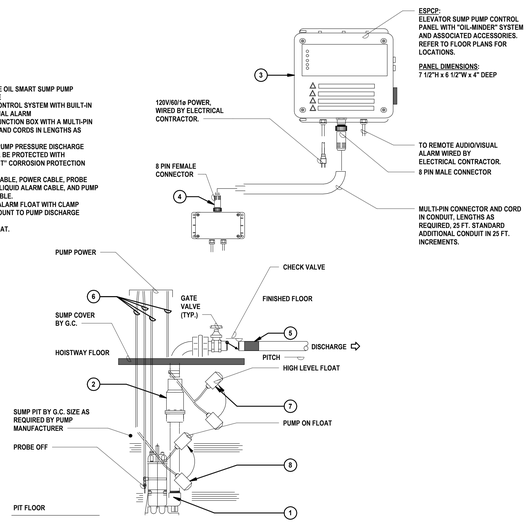
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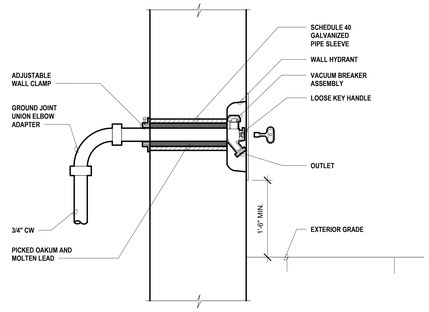
KEY:

1. SUBMERSIBLE OIL SMART SUMP PUMP
2. CHECK VALVE
3. OIL SMART CONTROL SYSTEM WITH BUILT-IN AUDIBLE/VISUAL ALARM
4. OVERLOAD JUNCTION BOX WITH A MULTI-PIN CONNECTOR AND CORDS IN LENGTHS AS REQUIRED.
5. ALL BURIED PUMP PRESSURE DISCHARGE PIPING SHALL BE PROTECTED WITH TAPECOAT "C1" CORROSION PROTECTION TAPE.
6. OIL MINDER CABLE, POWER CABLE, PROBE CABLE, HIGH LIQUID ALARM CABLE, AND PUMP ON FLOAT CABLE.
7. HIGH LIQUID ALARM FLOAT WITH CLAMP DEVICE TO MOUNT TO PUMP DISCHARGE PIPING.
8. PUMP ON FLOAT.



PIT MOUNTED ELEVATOR SUMP PUMP WITH "OIL MINDER" SYSTEM INSTALLATION DETAIL(PL)1

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NON-FREEZE WALL HYDRANT DETAIL (PL)1

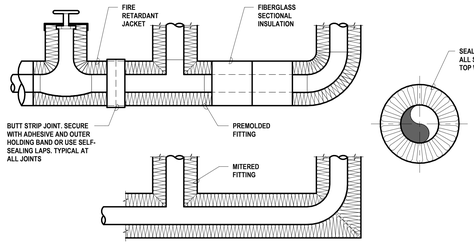
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CONCEALED VALVES AND FITTINGS:

- WRAP WITH 1 INCH THICK, 1 POUND DENSITY INSULATION TO REQUIRED PIPE INSULATION THICKNESS
- SECURE WITH WIRE OR TAPE
- VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

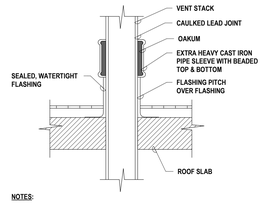
EXPOSED VALVES AND FITTINGS:

- PREMOLDED FIBERGLASS OR RADIAL METERED PIPE INSULATION.
- SKIM COAT OF INSULATING CEMENT.
- WRAP WITH FIBERGLASS REINFORCING CLOTH.
- FINISH COAT OF MASTIC.
- OVERLAP 2-INCHES ON PIPE INSULATION



INSULATION OF PIPING, VALVES, AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS (PL)1

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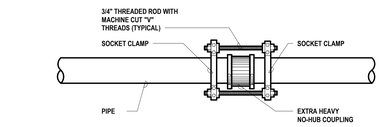


NOTES:

1. THE HEIGHT OF THE VENT PIPE SHALL EXTAND A MINIMUM OF 24" ABOVE THE FINISHED ROOF ELEVATION.
2. THE VENT PIPE DIAMETER SHALL BE INCREASED TO A MINIMUM OF 4" DIAMETER A MINIMUM OF 12" BELOW THE ROOF.

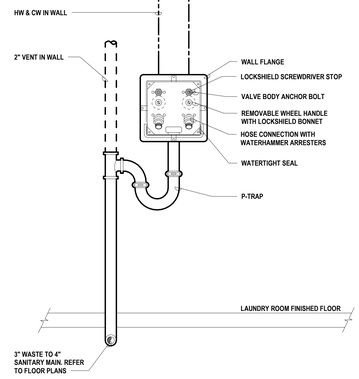
VENT THRU ROOF DETAIL (PL)1

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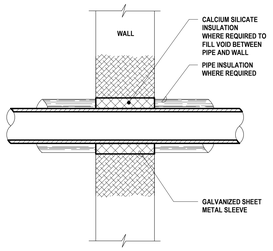
NO-HUB PIPE BRACING FOR HORIZONTAL PIPING (6"+) (PL)1

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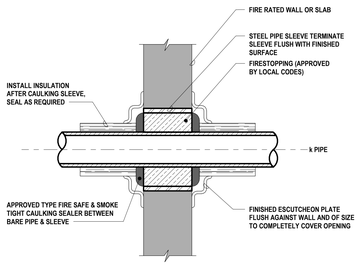
SCHEMATIC OF CLOTHES WASHER SUPPLY/DRAIN BOX DETAIL (PL)

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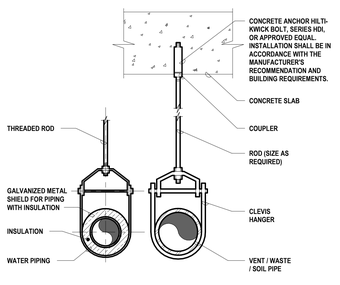
PLUMBING - FIRE/SMOKE STOPPING WALL PENETRATION DETAIL

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PLUMBING - FIRE/SMOKE STOPPING WALL PENETRATION DETAIL 2

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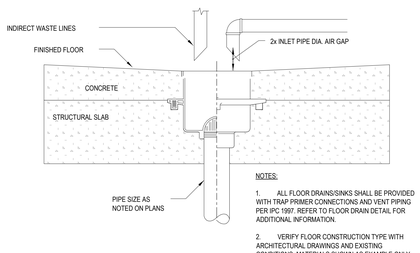


NOTES:

1. CLEVIS HANGERS REQUIRED ON PIPING LARGER THAN 1".

TYPICAL HANGER DETAILS

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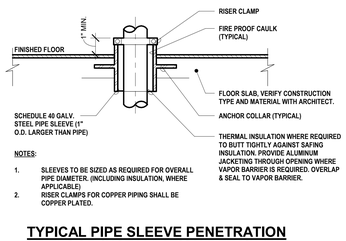


NOTES:

1. ALL FLOOR DRAINS/SINKS SHALL BE PROVIDED WITH TRAP PRIMER CONNECTIONS AND VENT PIPING PER IPC 1907. REFER TO FLOOR DRAIN DETAIL FOR ADDITIONAL INFORMATION.
2. VERIFY FLOOR CONSTRUCTION TYPE WITH ARCHITECTURAL DRAWINGS AND EXISTING CONDITIONS. MATERIALS SHOWN AS EXAMPLE ONLY. CONTRACTOR SHALL FIELD VERIFY EXISTING FLOOR TYPE PRIOR TO INSTALLATION.

TYPICAL INDIRECT WASTE PIPE TO FLOOR DRAIN/SINK DETAIL

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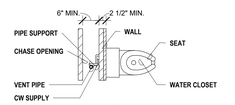


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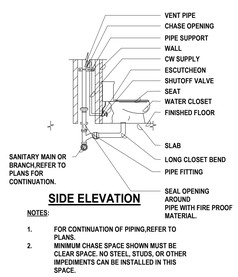
1. SLEEVES TO BE SIZED AS REQUIRED FOR OVERALL PIPE DIAMETER. (INCLUDING INSULATION, WHERE APPLICABLE)
2. RISER CLAMPS FOR COPPER PIPING SHALL BE COPPER PLATED.

TYPICAL PIPE SLEEVE PENETRATION OF FLOOR INSTALLATION DETAIL (PL)

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PLAN VIEW



SIDE ELEVATION

NOTES:

1. FOR CONTINUATION OF PIPING,REFER TO PLANS.
2. MINIMUM CHASE SPACE SHOWN MUST BE CLEAR SPACE. NO STEEL, STUDS, OR OTHER IMPEDIMENTS CAN BE INSTALLED IN THIS SPACE.

TYPICAL TANK TYPE WATER CLOSET PIPING INSTALLATION DETAIL (STANDARD AND ACCESSIBLE TYPES) (PL)

NTS

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28 PEARL STREET
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PLUMBING DETAILS

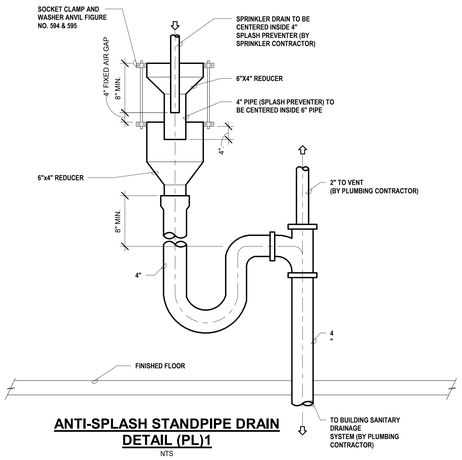
NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

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FILE NAME:

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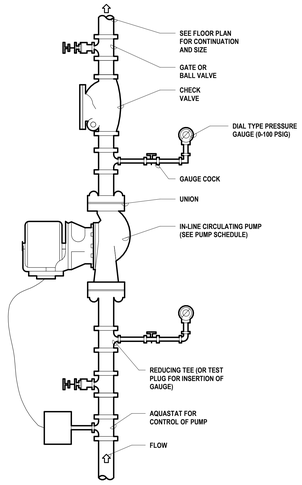
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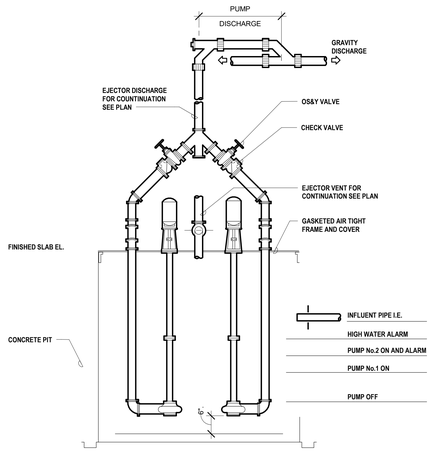
ANTI-SPLASH STANDPIPE DRAIN DETAIL (PL)1

NTS



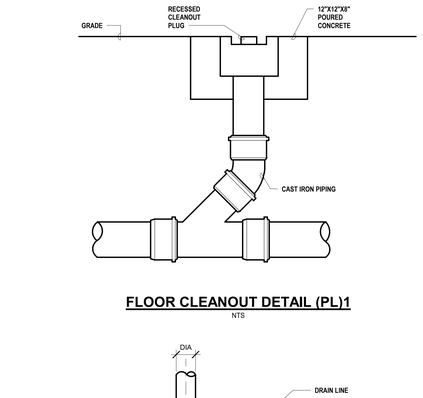
CIRCULATING PUMP DETAIL (PL)1

NTS



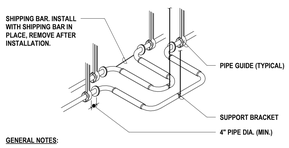
DETAIL OF VERTICAL SHAFT EJECTOR PUMPS IN CONCRETE PIT (PL)1

NTS



FLOOR CLEANOUT DETAIL (PL)1

NTS

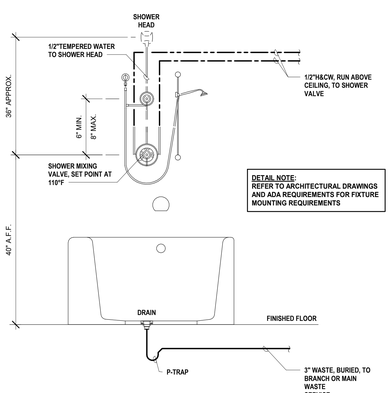


GENERAL NOTES:

1. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. INSTALL ARMAFLEX INSULATION ON BRAIDED FLEXIBLE CONNECTIONS. INSULATE REMAINING PIPING AS INDICATED IN THE SPECIFICATIONS.

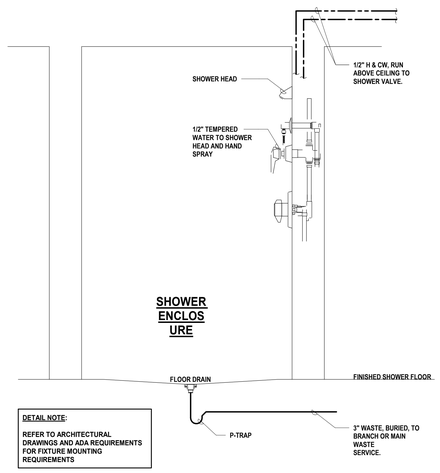
TYPICAL SEISMIC SEPARATION JOINT PIPING DETAIL (COPPER PIPE) (PL)1

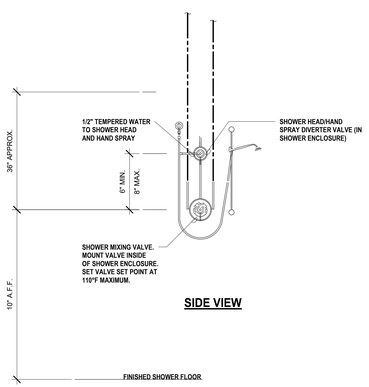
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TYPICAL SHOWER/TUB PIPING INSTALLATION DETAIL (STANDARD AND ACCESSIBLE TYPES) (PL)

NTS

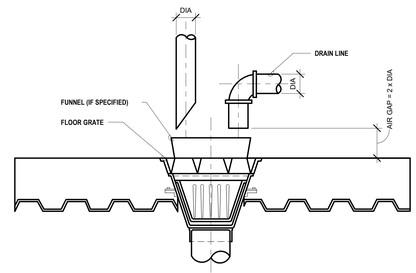




SIDE VIEW

TYPICAL SHOWER PIPING INSTALLATION DETAIL (STANDARD TYPE) (PL)

NTS

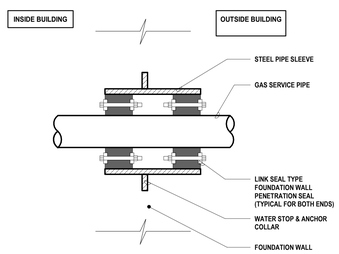


NOTES:

1. MOUNT WITH LIP 2" ABOVE FINISHED FLOOR IN KITCHENS. MOUNT FLUSH WITH FINISHED FLOOR IN BAR AREA.

FLOOR SINK DETAIL (PL)1

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NOTES:

1. THE SLEEVE SHALL BE INSTALLED 2' BELOW STREET GRADE. 1' BEYOND PROPERTY LINE, AND 4" INSIDE THE BUILDING AS PER CON EDISON REQUIREMENTS.
2. REFER TO CON EDISON REQUIREMENTS FOR ALL INSTALLATION REQUIREMENTS.

GAS SERVICE PIPE PENETRATION FOUNDATION WALL BELOW GRADE (PL)1

NTS

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PLUMBING DETAILS

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

PROJECT No: 8262400
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FILE NAME:

P-703

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ELECTRICAL SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

SYMBOL	DESCRIPTION
	20A, 125V DECORA STYLE DUPLEX RECEPTACLE - FLUSH WALL MOUNTED
USB	20A, 125V DECORA STYLE DUPLEX RECEPTACLE WITH DUAL USB PORTS
CR	20A, 125V SPLIT DUPLEX CONTROLLED RECEPTACLE. LUTRON #CARDS-20-STR. PROGRAM TO WIRELESS SENSOR IN SPACE.
	20A, 125V SINGLE RECEPTACLE - FLUSH WALL MOUNTED
	20A, 125V DECORA STYLE QUADRUPLEX RECEPTACLE - FLUSH WALL MOUNTED
	20A, 125V DECORA STYLE GFCI TYPE DUPLEX RECEPTACLE - FLUSH WALL MOUNTED
WP	20A, 125V GFCI TYPE WEATHER RESISTANT DUPLEX RECEPTACLE IN WEATHER PROOF ENCLOSURE
	SPECIAL PURPOSE RECEPTACLE, COORDINATE EXACT NEMA TYPE WITH EQUIPMENT MANUFACTURER
	20A, 125V DECORA STYLE HALF SWITCHED DUPLEX RECEPTACLE - FLUSH WALL MOUNTED. BOTTOM HALF OF DUPLEX RECEPTACLE TO BE SWITCHED VIA WALL SWITCH
	FLUSH FLOOR MOUNTED COMBINATION VOICE/DATA & POWER OUTLET
J	CEILING MOUNTED JUNCTION BOX WITH FINAL EQUIPMENT CONNECTION
J	FLUSH WALL MOUNTED JUNCTION BOX WITH FINAL EQUIPMENT CONNECTION
J	FLUSH FLOOR MOUNTED JUNCTION BOX WITH FINAL EQUIPMENT CONNECTION
	UNFUSED DISCONNECT SWITCH - 30A, 3P, U.O.N.
100A / 60A	FUSED DISCONNECT SWITCH - 100 AMP SWITCH, 60 AMP FUSE, UNFUSED (EXCEPT WHERE FUSE SIZE IS INDICATED) 3-POLE (EXCEPT WHERE NOTED)
ERMS	ARC-FAULT ENERGY REDUCTION MAINTENANCE SWITCH, PROVIDE FOR ALL CIRCUIT BREAKERS 1200A OR LARGER
CB 100A / 60A	CIRCUIT BREAKER 100A FRAME/60A TRIP, 3 POLE, U.O.N. ST - SHUNT TRIP
VFD	VARIABLE FREQUENCY DRIVE (VFD), FURNISHED BY MECHANICAL CONTRACTOR INSTALLED BY ELECTRICAL CONTRACTOR. COORD. LOCATION WITH MECH. CONTRACTOR
TVSS	SURGE SUPPRESSER, LIEBERT ACCUVAR #ACV-120-V-111-RKE. FED WITH 30A/3P CIR MOUNT WITHIN 3ft OF TOTAL WIRE LENGTH FROM SOURCE
FSD	COMBINATION FIRE/SMOKE DAMPER - COORD. LOCATION WITH MECH. CONTRACTOR INTERCONNECT TO FIRE ALARM SYSTEM
M	MOTOR
	PULLBOX, SIZED PER NEC
T	DRY TYPE 480-208V TRANSFORMER DELTA-WYE WITH GROUNDED SECONDARY SIDE, U/ON.
	FLUSH OR SURFACE MOUNTED PANELBOARD
	NID PANEL, COORDINATE WITH TELECOM/SECURITY VENDOR
GND	GROUND BAR
	2#12-1#12G-3/4"C FOR ONE CKT. HOMERUN, U.O.N.
	3#12-1#12G-3/4"C FOR TWO CKT. HOMERUN, U.O.N.
	4#12-1#12G-3/4"C FOR THREE CKT. HOMERUN, U.O.N.
	3#12-1#12G-3/4"C HOMERUN, U.O.N.
	CONCEALED CONDUIT
	CONDUIT TURNING UP
	CAPPED CONDUIT
	FLEXIBLE EQUIPMENT CONNECTION
	GROUND CONNECTION
	CIRCUIT BREAKER - MOLDED CASE TYPE
	DRAW OUT TYPE CIRCUIT BREAKER
	FUSED SWITCH, TYPE 'FA' FUSE
	CONDUIT RUN IN CEILING
	CONDUIT RUN UNDER SLAB
M	UTILITY METER WITH CT. COMPARTMENT
SUB M	DIGITAL SUB-METER E-MON D-MON 2000 CLASS #2084000 KIT, PROVIDE A 20A/3-POLE BREAKER IN LOCAL POWER PANEL
CHIME DB / DB T	DOOR BELL PUSH BUTTON / DOOR BELL CHIME AND ASSOCIATED TRANSFORMER
TV	WALL MOUNTED TELEVISION OUTLET WITH 3/4" EMPTY CONDUIT & DRAG LINE TERMINATED IN A 90° BEND 8" INTO NEAREST ACCESSIBLE CEILING
	VOICE & DATA OUTLET LOCATION WITH 1" EMPTY CONDUIT & DRAG LINE TERMINATED IN A 90 DEG. BEND 8" INTO NEAREST ACCESSIBLE CEILING
$SA	ADA "CALL FOR ASSISTANCE" PULL CORD SWITCH, HORN/STROBE & 24V TRANS., EST EDWARDS KIT MODEL #8039-CD
$T	MANUAL STARTER - TOGGLE TYPE WITH THERMAL ELEMENT - 250V HP RATED, FURNISHED BY ELEC CONTRACTOR
	CEILING MOUNTED EDGE-LIT LED EXIT SIGN WITH EMERGENCY BATTERY BACKUP, DUAL-LITE LE SERIES
	WALL MOUNTED EDGE-LIT LED EXIT SIGN WITH EMERGENCY BATTERY BACKUP, DUAL-LITE LE SERIES - "LO" INDICATE LOW LEVEL EXIT SIGN
	WALL MOUNTED EMERGENCY LIGHTING UNIT, DUAL-LITE #LZ-25-03L
	RECESSED CEILING MOUNTED EMERGENCY LIGHTING UNIT, DUAL-LITE #EVAR
	FLUSH FLOOR MOUNTED GFCI TYPE DUPLEX RECEPTACLE
	FLUSH FLOOR MOUNTED POWER OUTLET

LIGHTING CONTROL SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

SYMBOL	DESCRIPTION
$	SINGLE POLE DECORA STYLE LINE VOLTAGE SWITCH
$3	3-WAY LINE DECORA STYLE VOLTAGE SWITCH
VD	WALL MOUNTED INFRARED DIMMING SENSOR, LUTRON #MS-Z101-WH
D	LUTRON NOVA T SERIES DIMMER SWITCH, U.O.N., EXACT DEVICE SPEC SHALL BE COORDINATED WITH LIGHT FIXTURE DIMMING CAPABILITIES
PP	POWER PACK MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING LUTRON #PP-DV-M
VS	DUAL TECHNOLOGY VACANCY SENSOR LOW VOLTAGE, CEILING MOUNTED. LUTRON #LOS-CDT-2000R-WH
OS	DUAL TECHNOLOGY OCCUPANCY SENSOR LOW VOLTAGE, CEILING MOUNTED. LUTRON #LOS-CDT-2000R-WH
DM	0-10V DIMMING MODULE MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #RMJS-8T-DV-B
DM EM	0-10V EMERGENCY DIMMING MODULE MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #RMJS-8T-DV-B-EM
RM	RELAY MODULE MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #RMJS-16R-DV-B
RM EM	POWER PACK MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING LUTRON #RMJS-16R-DV-B-EM
WS	WIRELESS OCCUPANCY SENSOR, CEILING MOUNTED, LUTRON #LRF2-OCR2B-P-WH
DS	WIRELESS DAYLIGHT SENSOR, CEILING MOUNTED, LUTRON #LRF2-DCRB-WH
WS	WALL MTD WIRELESS OCCUPANCY SENSOR, LUTRON #LRF2-O-W-LB-P-WH
WH	VIVE WIRELESS HUB, FLUSH MOUNTED, LUTRON #HUS-0-FM • #PS-J-20W-UNV POWER SUPPLY MOUNTED IN JUNCTION BOX
VS OS	WALL MTD DUAL TECHNOLOGY VACANCY/OCCUPANCY SENSOR, LUTRON #MS-B102
HS	WALL MTD WIRELESS OCCUPANCY SENSOR FOR HALLWAYS, LUTRON #LRF2-OHLB-P-WH
DS	WIRELESS DAYLIGHT SENSOR, CEILING MOUNTED, LUTRON #LRF2-DCRB-WH
$LV	LOW VOLTAGE MOMENTARY SWITCH, LUTRON #NRTCS-1-WH
$2S	WIRELESS 2-BUTTON SWITCH, LUTRON #PJ2-2B-GWH-L01 • #CW-1-WH
$2S	WIRELESS 2-BUTTON RAISE/LOWER SWITCH, LUTRON #PJ2-2BRL-GWH-L01 • #CW-1-WH
$4S	WIRELESS 4-BUTTON SCENE SWITCH, LUTRON #PJ2-4B-GWH-L31 • #CW-1-WH
$QR	REMOTE TIMED OVERRIDE SWITCH TORK #SSA2000R-24
TC	DIGITAL TIME CLOCK TORK DLC SERIES #DLC400BP
G	SINGLE FIXTURE GENERATOR TRANSFER DEVICE, PHILLIPS BODINE #GTD
BLCD	SINGLE CIRCUIT GENERATOR TRANSFER DEVICE WITH OVERRIDE, PHILLIPS BODINE #BLCD-20B
GTD	SINGLE CIRCUIT GENERATOR TRANSFER DEVICE WITH DIMMING CONTROL AND OVERRIDE, PHILLIPS BODINE #GTD-20A

FIRE ALARM SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

SYMBOL	DESCRIPTION
S	CEILING MOUNTED ADDRESSABLE SMOKE DETECTOR
CO	CEILING MOUNTED ADDRESSABLE CARBON MONOXIDE DETECTOR
S EL	ELEVATOR RECALL ADDRESSABLE SMOKE DETECTOR
S CO	CEILING MOUNTED LINE VOLTAGE (RESIDENTIAL TYPE) COMBINATION SMOKE/CARBON MONOXIDE DETECTOR, INTERCONNECTED WITHIN UNIT
S SB	CEILING MOUNTED ADDRESSABLE COMBINATION SMOKE/CARBON MONOXIDE DETECTOR WITH SOUNDER BASE
S H	WALL MOUNTED ADDRESSABLE SMOKE AND THERMAL DETECTOR RATE-OF-RISE
H	CEILING MOUNTED ADDRESSABLE THERMAL DETECTOR RATE-OF-RISE
D	DUCT SMOKE DETECTOR, PROVIDE REMOTE TEST SWITCH AND LED INDICATOR LIGHT
CONV	INDICATES CONVENTIONAL DEVICE, PROVIDE MONITOR MODULE EXTERIOR TO DEVICE LOCATION
FSD	FIRE SMOKE DAMPER, PROVIDE DUCT SMOKE DETECTOR, CONTROL MODULE AND RELAY
TS	SPRINKLER TAMPER SWITCH, PROVIDE MONITOR MODULE
WF	SPRINKLER WATER FLOW SWITCH, PROVIDE MONITOR MODULE
DGP	FIRE ALARM DATA GATHERING PANEL
FACP	FIRE ALARM CONTROL PANEL
FAP	FIRE ALARM REMOTE ANNUNCIATOR PANEL
F	COMBINATION FIRE ALARM SPEAKER/STROBE LIGHT UNIT - FLUSH WALL MOUNTED (WITH ADJUSTABLE CANDELA RATING)
F	FIRE ALARM STROBE LIGHT UNIT - FLUSH WALL MOUNTED (WITH ADJUSTABLE CANDELA RATING)
F	FIRE ALARM LOW FREQUENCY SPEAKER UNIT - FLUSH WALL MOUNTED
F	FIRE ALARM PULL STATION
DH	DOOR HOLDER
MM	FIRE ALARM MONITOR MODULE
CM	FIRE ALARM CONTROL MODULE
S/C	CEILING MOUNTED ADDRESSABLE COMBINATION SMOKE/CARBON MONOXIDE DETECTOR

LIGHT FIXTURE SCHEDULE:

1. COORDINATE WITH ARCHITECT AND INTERIOR DESIGNER FOR ALL LIGHT FIXTURE FINISHES AND MOUNTING REQUIREMENTS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR FRONT OF HOUSE LIGHT FIXTURE SCHEDULE AND SPECIFICATIONS.

FIXT. TYPE/ SYMBOL	DESCRIPTION	VOLTAGE	MANUFACTURER	CATALOG NUMBER	LAMP	REMARKS
GA	LED SURFACE MOUNTED TO CEILING PARKING GARAGE LUMINAIRE	UNV	BEACON PRODUCTS	SRT1-35-4K7-SQW-UNV	36.3W	FIXTURES SHALL DIM TO 30% OUTPUT DURING VACANCY
GB	LED SURFACE MOUNTED TO CEILING PARKING GARAGE LUMINAIRE	UNV	BEACON PRODUCTS	SRT1-15-4K7-SQW-UNV	16.85W	FIXTURES SHALL DIM TO 30% OUTPUT DURING VACANCY
GC	LED SURFACE MOUNTED TO CEILING PARKING GARAGE LUMINAIRE	UNV	BEACON PRODUCTS	SRT2-140-4K7-SC-UNV	128.5W	FIXTURES SHALL DIM TO 30% OUTPUT DURING VACANCY
B1	LED SURFACE MOUNTED EXTERIOR STAIRWELL LUMINAIRE	UNV	COLUMBIA LIGHTING	LXEF4-40LW-DFA-EDU-ELL14-DS1AWLK	36W	FIXTURES SHALL DIM TO 30% OUTPUT DURING VACANCY
B2	LED SURFACE MOUNTED INTERIOR STAIRWELL LUMINAIRE	UNV	COLUMBIA LIGHTING	ESL4-40ML-FPW-EDUELL14	40W	FIXTURES SHALL DIM TO 50% OUTPUT DURING VACANCY
B3	LED LENSED STRIPLIGHT	UNV	COLUMBIA LIGHTING	MPS490-40ML-CW-EDU #ELL14 AS INDICATED BY 'EMB'	42W	PROVIDE EMERGENCY BATTERY PACK FOR FIXTURES DESIGNATED WITH "EMB"
B4	LED ENCLOSED AND GASKETED STRIPLIGHT	UNV	COLUMBIA LIGHTING	LXEM4-40ML-RFA-EU	42W	
XP B5	EXPLOSION PROOF LED	UNV	CURRENT	HLHFXL-50L-4-2L-U	48W	
B6	LED VAPORTITE JELLY JAR	UNV	CURRENT	VTC5KG-U	27W	
B7	LED GASKETED ELEVATOR PIT LUMINAIRE	UNV	COLUMBIA LIGHTING	LXEM4-40ML-RFA-EU	42W	
B8	LED 2 X 4 EDGE LIT FLAT PANEL	UNV	COLUMBIA LIGHTING	CFP24-4140-HE *PLDTDM OPTION WHERE APPLICABLE	34W	
B10	LED 2' LENSED STRIPLIGHT	UNV	COLUMBIA LIGHTING	MPS290-40ML-CW-EU-ELL14	29W	
EM	INTERIOR LED EMERGENCY WALL PACK FIXTURE	UNV	EVENLITE	WW-EM-XX	10W	NORMALLY OFF, EMERGENCY ONLY
EXT.N EM	EXTERIOR LED EMERGENCY WALL PACK FIXTURE	UNV	EVENLITE	WW-EM-XX-CT	10W	"N" INDICATES NORMALLY ON OPTION VIA PHOTOCELL
	LED SURFACE MOUNT EDGE LIT EXIT SIGN WITH EMERGENCY BATTERY BACKUP	UNV	DUAL LITE	LES SERIES	5W	
WP	LED SURFACE MOUNT EDGE LIT EXIT SIGN WITH EMERGENCY BATTERY BACKUP	UNV	COMPASS	CEWSRE CEWDRE	5W	

ELECTRICAL ABBREVIATIONS

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

A	AMPERE	KCM	THOUSAND CIRCULAR MILS
AC	ABOVE COUNTER	KV	KILOVOLT
AFF	ABOVE FINISHED FLOOR	KVA	KILOVOLT AMPERE
AIC	AMP INTERRUPTING CAPACITY	KW	KILOWATT
ATS	AUTOMATIC TRANSFER SWITCH	KWH	KILOWATT HOUR
AUTO	AUTOMATIC	LTG	LIGHTING
AWG	AMERICAN WIRE GAUGE	MAX	MAXIMUM
BLDG	BUILDING	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCC	MOTOR CONTROL CENTER
CB	CIRCUIT BREAKER	MIN	MINIMUM
CCTV	CLOSED CIRCUIT TELEVISION	MTD	MOUNTED
CKT	CIRCUIT	N	NEUTRAL
CO	CARBON MONOXIDE	NIC	NOT IN CONTRACT
COMM	COMMUNICATION	NTS	NOT TO SCALE
CT	CURRENT TRANSFORMER	OC	ON CENTER
CU	COPPER	P	POLE
DEG	DEGREE	Ø or PH	PHASE
DGP	DATA GATHERING PANEL	PNL	PANEL
DISC	DISCONNECT	PWR	POWER
DN	DOWN	R	RELOCATED
DWG	DRAWING	RECEPT	RECEPTACLE
E/EX	EXISITNG TO REMAIN	TEL	TELEPHONE
EC	ELECTRICAL CONTRACTOR	TOS	TOP OF SHAFT
EM	EMERGENCY	TV	TELEVISION
ER	EXISTING TO BE REMOVED	TYP	TYPICAL
FA	FIRE ALARM	UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	V	VOLT OR VOLTAGE
FL	FLOOR	VA	VOLT AMPERE
FT	FEET OR FOOT	VIF	VERIFY IN FIELD
GRD	GROUND	W	WATT
GFI	GROUND FAULT INTERRUPTER	WP	WEATHERPROOF
HID	HIGH INTENSITY DISCHARGE	WT	WATERTIGHT
HP	HORSE POWER	XP	EXPLOSION PROOF
HZ	HERTZ		
JB	JUNCTION BOX		

NEW YORK STATE CODES & STANDARDS

- 2020 BUILDING CODE OF NEW YORK STATE
- 2020 FIRE CODE OF NEW YORK STATE
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE
- 2020 FUEL GAS CODE OF NEW YORK STATE
- 2020 NYS UNIFORM CODE SUPPLEMENT
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL
- ALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

NEW YORK STATE ENERGY CODES

- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2016 ASHRAE 90.1
- 2020 SUPPLEMENT TO THE NEW YORK STATE ENERGY CONSERVATION CODE

LOCAL CODES

- PORTCHESTER MUNICIPAL CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2016 NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- 2016 NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
- 2016 NFPA 20 - STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE FOR PROTECTION.
- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE
- 2016 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE

TWO WAY COMMUNICATION SYMBOL LIST

NOTES:
1. PROVIDE ALL EQUIPMENT, CONDUIT AND WIRING BETWEEN BASE STATION AND CALL BOXES AS REQUIRED FOR A COMPLETE CODE COMPLIANT INSTALLATION.
2. PROVIDE LED LIGHTED SIGNS WITH BATTERY BACKUP, CIRCUIT TO NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ANY CONTROLS.
3. PROVIDE ALL SIGNAGE (CALL BOX INSTRUCTION SIGNS, EMERGENCY COMMUNICATION SIGNS, ETC.) AS REQUIRED.
4. PROVIDE A COMMAND SYSTEM SUPERVISOR AND A SECONDARY POWER SUPPLY (UPS).

SYMBOL	DESCRIPTION
2WB	TWO WAY COMMUNICATION BASE STATION, RATH #2500-210PSS, WITH ENCLOSURE, RATH #2500-210FM, PROVIDE 120V DEDICATED FROM EMERGENCY PANEL WITH LOCKABLE CIRCUIT BREAKER
2W	TWO WAY COMMUNICATION CALL BOX, RATH #2100-958SSRC2, WITH DIRECTION SIGN, RATH #7049SS

ELECTRICAL SHEET LIST

SHEET NUMBER	SHEET NAME
E-001	ELECTRICAL COVER SHEET
E-002	ELECTRICAL NOTES
E-101	ELECTRICAL CELLAR 2 & CELLAR 1 FLOOR POWER PLANS
E-102	ELECTRICAL FIRST FLOOR & UPPER ELEVATOR LOBBY POWER PLANS
E-103	ELECTRICAL 2ND & TYPICAL (3RD-7TH) FLOOR POWER PLANS
E-104	ELECTRICAL 8TH & 9TH FLOOR POWER PLANS
E-105	ELECTRICAL BUILDING ROOF & PENTHOUSE ROOF POWER PLANS
E-301	ELECTRICAL TYPICAL UNIT POWER PLANS
E-501	ELECTRICAL POWER RISER DIAGRAM (1 OF 2)
E-502	ELECTRICAL POWER RISER DIAGRAM (2 OF 2)
E-503	ELECTRICAL POWER RISER NOTES & FEEDER SCHEDULE
E-504	ELECTRICAL FIRE ALARM RISER DIAGRAM
E-505	ELECTRICAL TELECOM RISER DIAGRAM
E-506	FIRE ALARM ERRCS RISER DIAGRAM
E-601	ELECTRICAL PANEL SCHEDULES
E-701	ELECTRICAL DETAILS (1 OF 3)
E-702	ELECTRICAL DETAILS (2 OF 3)
E-703	ELECTRICAL DETAILS (3 OF 3)

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28 PEARL STREET
PORTCHESTER, NY

ELECTRICAL COVER SHEET

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
DRAWN BY: MV/MD
CHECKED BY: Checker
PLOT DATE: 2/7/2025 12:23:45 PM
FILE NAME:

E-001

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ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE NATIONAL ELECTRIC CODE, BUILDING DEPARTMENT, BUILDING MANAGEMENT, ALL AUTHORITIES HAVING JURISDICTION, AND APPLICABLE NATIONAL, STATE, AND LOCAL CODES. LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK SHALL BE INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS. CONTRACTOR IS TO INFORM THE ENGINEER OF ANY EXISTING WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION OF LAWS AND REGULATIONS SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE BY THIS CONTRACTOR AND AT NO EXPENSE TO THE OWNER.

2. PRIOR TO SUBMISSION OF BID, THIS CONTRACTOR SHALL VISIT THE JOB SITE TO ASCERTAIN THE ACTUAL FIELD CONDITIONS AS THEY RELATED TO THE WORK AS INDICATED ON THE DRAWINGS AND DESCRIBED HEREIN. DISCREPANCIES, IF ANY, SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO SUBMISSION OF BID, AND, IF NOT RESOLVED TO SATISFACTION, SHALL BE SUBMITTED AS A WRITTEN QUALIFICATION OF THE BID. SUBMISSION OF A BID SHALL BE EVIDENCE THAT SITE VERIFICATION HAS BEEN PERFORMED AS DESCRIBED ABOVE.

3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK AND APPROXIMATE LOCATION OF EQUIPMENT. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND COORDINATE FINAL LOCATIONS OF SWITCHES, LIGHT FIXTURES, RECEPTACLES, ETC. WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS. IF A CONFLICT OCCURS IN THE SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.

4. PRIOR TO SUBMISSION OF BID, THIS CONTRACTOR SHALL REVIEW ALL DRAWINGS OF THE ENTIRE PROJECT INCLUDING GENERAL CONSTRUCTIONS, DEMOLITION, ARCHITECTURAL, MECHANICAL, ELECTRICAL, TELECOM/AV/SECURITY, PLUMBING, AND FIRE PROTECTION AND SHALL INCLUDE ANY WORK REQUIRED IN THE BID WHICH IS INDICATED OR IMPLIED TO BE PERFORMED BY THIS TRADE IN OTHER SECTIONS OF THE WORK.

5. ANY EQUIPMENT, PARTS, MATERIALS, ACCESSORIES, OR LABOR THAT IS NECESSARY FOR PROPER PERFORMANCE OF THE ELECTRICAL WORK, ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN, OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED AS IF CALLED FOR IN DETAIL WITHOUT ADDITIONAL COST.

6. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME AT WHICH THE ELECTRICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER, AND IS UNDER CARE, CUSTODY, AND CONTROL OF THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURER'S SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP, OPERATION, AND SERVICING OF EQUIPMENT.

7. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND CONTRACTOR'S SERVICES NECESSARY FOR THE COMPLETE AND SAFE INSTALLATION OF ALL ELECTRICAL WORK. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
   - ELECTRICAL REQUIREMENTS SHALL BE IN CONFORMANCE WITH ENGINEERING BID DOCUMENTS AS WELL AS DOCUMENTS (SPECIFICATIONS & DRAWINGS) PREPARED BY LOCAL UTILITY COMPANY AND REFERENCED DRAWINGS IN THE UTILITY COMPANY DOCUMENTS NOT INCLUDED SHALL BE PART OF THIS CONTRACT.
   - CONTRACTOR SHALL COORDINATE AND ARRANGE TO RECEIVE AND/OR PICK UP SPECIFIC EQUIPMENT OUTLINED PRE-PURCHASE ITEMS.
   - REMOVAL AND RELOCATION OF EQUIPMENT AS REQUIRED WHEN INTERFERING WITH NEW WORK.
   - INSTALLATION OF NEW RACEWAY AND CONDUCTORS.
   - CUTTING, CHANNELING, CHASING, AND ROUGH PATCHING REQUIRED TO ACCOMMODATE THE ELECTRICAL INSTALLATION.
   - ADDITION OR MODIFICATION OF EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT.
   - INSTALLATION OF CONDUIT, JUNCTION BOXES, PULL BOXES, ETC., REQUIRED FOR THE AFOREMENTIONED EQUIPMENT.
   - MAINTENANCE AND PROPER OPERATION OF EXISTING BASE BUILDING SYSTEMS WITHIN THE CONTRACT AREA IN ACCORDANCE WITH THE REQUIREMENTS OF BUILDING MANAGEMENT.
   - TEMPORARY LIGHT AND POWER DURING CONSTRUCTION.
   - GROUNDING OF ALL EQUIPMENT AS REQUIRED BY CODE AND SPECIFIED.
8. THIS CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION TO DETERMINE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY BUILDING MANAGEMENT. FOR THE PURPOSE OF BID, ASSUME ANY NOISY WORK (E.G., CHOPPING, CORE DRILLING, ETC.) AND BASE BUILDING SYSTEM INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE NORMAL BUSINESS HOURS.
9. "THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION" AIA DOCUMENT A201 LATEST EDITION, OR AS REQUIRED BY THE ARCHITECTS DOCUMENTS AND/OR THE STRUCTURAL ENGINEERS DOCUMENTS, AS APPLICABLE, ARE PART OF THIS DOCUMENT.
10. SUBMIT SHOP DRAWINGS CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT ALL CERTIFIED EQUIPMENT CUTS WITH CONSTRUCTIONS WIRING DIAGRAMS. PROVIDE DIGITAL COPIES OF ALL DRAWINGS. SPECIFIC JOB REQUIREMENTS MAY BE MORE STRINGENT AND CONTRACTOR IS RESPONSIBLE TO OBTAIN REQUIREMENTS FROM CONSTRUCTION MANAGER, GENERATOR CONTRACTOR, OR ARCHITECT.
11. SUBMIT (4) LOOSE-LEAF BOUND OPERATING AND MAINTENANCE MANUALS WITH INDEX AND INDEX TABS TO INCLUDE ALL SHOP DRAWINGS AND OPERATING AND MAINTENANCE INSTRUCTIONS ON ALL SYSTEMS.
12. CONTRACTOR SHALL REVISE SHOP DRAWINGS TO CONFORM TO RECORD DRAWINGS AND SUBMIT AN AS-BUILT CONDITION (DEVICES, EQUIPMENT, CIRCUITRY, ETC.) DRAWINGS UPON COMPLETION OF THE PROJECT. FINAL SUBMISSION OF REPRODUCIBLE AS-BUILT DRAWINGS ARE TO BE SIGNED AND CERTIFIED BY THE INSTALLING CONTRACTOR THAT THIS IS AS-BUILT CONDITION OF THE WORK.
13. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSION, PERFORMANCE, AND MATERIAL SPECIFICATIONS. ANY CHANGES IN LAYOUT, ELECTRICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS, OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM SUBSTITUTION.
14. THIS CONTRACTOR SHALL SUBMIT FOR APPROVAL, A PLAN INDICATING THE SIZE AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, JUNCTION BOXES, PULL BOXES, ETC. THIS CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.
15. REMOVAL, TEMPORARY CONNECTIONS, AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON EXISTING CONDITIONS FOR PROPER INSTALLATION OF NEW WORK.
16. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE ORGANIZED WITH BUILDING MANAGEMENT. PROVIDE TEMPORARY FEEDERS, CIRCUITRY, ETC., AS REQUIRED TO MINIMIZE DOWNTIME.
17. DISCONNECTS SHALL BE 'QUICK-BREAK' HEAVY DUTY TYPE IN NEMA 1 ENCLOSURE FUSED OR UN-FUSED AS INDICATED ON THE DRAWINGS. FUSES FOR SWITCHES SHALL BE CURRENT LIMITING TYPE WITH AN INTERRUPTING CAPACITY OF 200,000 RMS AMPERES AND OF THE CONTINUOUS CURRENT RATING AS SHOWN ON THE DRAWINGS.
18. CIRCUIT BREAKERS SHALL BE "THERMAL MAGNETIC" TYPE, QUICK-MAKE, QUICK-BREAK WITH NON-WELDING CONTACTS COMPENSATED FOR AMBIENT TEMPERATURES AND SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 10,000 AMPERES SYMMETRICAL FOR 120/208V PANELS AND 14,000 AMPERES SYMMETRICAL FOR 277/480V PANELS OR HIGHER WHERE NOTES.
19. CONDUIT SHALL BE RIGID THREADED REGARDLESS OF SIZE.
20. ALL CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN INSULATED. ALL CONDUCTORS SHALL HAVE 600 VOLT RATED INSULATION, UNLESS OTHERWISE NOTED. UNLESS SPECIFIED ALL WIRE #10 AWG AND SMALLER SHALL BE SOLID CONDUCTORS AND 8 AWG AND LARGER SHALL BE STRANDED.
21. BRANCH CIRCUIT WIRE SIZE: THE MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE NO. 12 AWG EXCEPT 120V CIRCUITS OVER 80 FEET IN LENGTH SHALL BE 10 AWG.
22. PULL BOXES, JUNCTION BOXES, AND OUTLET BOXES SHALL BE MANUFACTURED FROM GALVANIZED INDUSTRY STANDARD SHALL STEEL.
23. PROVIDE PULL BOXES AND JUNCTION BOXES IN LONG STRAIGHT RUNS OF RACEWAY TO ASSURE THAT CABLES ARE NOT DAMAGED WHEN THEY ARE PULLED, TO FULFILL REQUIREMENTS AS TO THE NUMBER OF BENDS PERMITTED IN RACEWAY BETWEEN CABLE ACCESS POINTS, THE ACCESSIBILITY OF CABLE JOINTS AND SPLICES, AND THE APPLICATION OF CABLE SUPPORTS.
24. PULL BOXES AND JUNCTION BOXES SHALL BE SIZED SO THAT THE MINIMUM BENDING RADIUS CRITERIA SPECIFIED FOR THE WIRES AND CABLE ARE MAINTAINED.
25. ALL EQUIPMENT, DEVICE BOXES, JUNCTION BOXES, PULL BOXES, AND OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO THE BOX. IF NECESSARY AND APPROVED BY OWNER/ENGINEER, PROVIDE ACCESS DOOR OR COVER PLATES IN AREAS WHERE UNOBSTRUCTED ACCESS IS NOT POSSIBLE.
26. OPENINGS AROUND ELECTRICAL PENETRATION THROUGH FIRE RESISTANCE RATED WALL, PARTITIONS, FLOOR OR CEILING SHALL BE FIRE STOPPED USING APPROVED METHODS. SEALANT SHALL BE RATED FOR THREE (3) HOURS.
27. HEIGHTS OF OUTLETS FROM FINISHED FLOOR TO CENTERLINE OF OUTLET:
   - RECEPTACLES AND TELEPHONES 1' 6"
   - GENERALLY 3' 6"
   - OVER WORK BENCHES 4' 0"
   - WALL SWITCHES 4' 0"
   - WALL FIXTURES 6' 0"
   - MOTOR CONTROLLERS 5' 0"
   - FIRE ALARM PULL STATIONS 4' 0"
   - FIRE ALARM HORN/SPEAKER/STROBES 6' 8" AFF OR 6" BELOW CEILING (WHICHEVER IS GREATER)

EXCEPTIONS: AT JUNCTION BOXES OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE REQUIREMENTS, AS NOTED OR DIRECTED.

28. PROVIDE WEIGHTS, LOCATIONS, AND DIMENSIONS OF EQUIPMENT IN EXCESS OF 200 LBS. SUPPORTED ON FLOOR OR HUNG FROM BUILDING STRUCTURE TO BASE BUILDING STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
29. THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH HVAC, PLUMBING, FIRE PROTECTION, TELECOM/AV/SECURITY, AND OTHER TRADES FOR EXACT LOCATION OF ALL MOTOR AND CONTROL DEVICES, BACK BOXES, AND CONDUIT REQUIREMENTS. LOCATIONS AS SHOWN ON ELECTRICAL DRAWINGS ARE APPROXIMATE.
30. PROVIDE PRICING FOR EXTENDED WARRANTIES (2-5 YEARS) FOR THE SYSTEMS NOTED ON THE ELECTRICAL DRAWINGS AND SPECIFICATIONS. PROVIDE PRICING FOR WARRANTIES BEYOND 5-YEARS WHERE POSSIBLE.
31. EXTERIOR RECEPTACLES SHALL BE PROVIDED WITH WEATHERPROOF "WHILE IN USE" COVERS.
32. PRIOR TO PASSING FINAL INSPECTION, AN APPROVED AGENCY SHALL PROVIDE EVIDENCE THAT THE LIGHTING CONTROL SYSTEMS HAVE BEEN TESTED TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTRUCTIONS. REFER TO THE INTERNATIONAL ENERGY CONSERVATION CODE SECTION C408.3 FOR EXACT REQUIREMENTS.
33. COORDINATION WITH BUILDING MANAGEMENT
   - THIS CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION TO DETERMINE THE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY THE BUILDING.
   - THIS CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE BUILDING OWNER'S RULES AND REGULATIONS. ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND THE BUILDING RULES AND REGULATIONS SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT/ENGINEER FOR REVIEW WITH BID SUBMISSION.
   - COORDINATE WITH BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS, OR CONTRACTOR TO PROVIDE A MINIMUM OF TWO (2) DAYS NOTICE PRIOR TO ANY WORK BEING PERFORMED, WHICHEVER IS THE MORE STRINGENT. CONTRACTOR IS TO PERFORM WORK ON PREMIUM TIME, IF SO DIRECTED BY BUILDING OWNER, SO AS NOT TO DISTURB EXISTING TENANTS ON OTHER FLOORS.
   - ALL NEW ELECTRICAL DEVICES SHALL MATCH THE BASE BUILDING STANDARD.

ELECTRICAL POWER NOTES

A. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL DRAWINGS AND ARCHITECT IN FIELD FOR EXACT LOCATION, QUANTITY AND ELEVATION OF POWER AND TELEPHONE/DATA OUTLETS PRIOR TO INSTALLATION.

B. RECEPTACLES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH DEVICE. CIRCUITRY MAY BE SHOWN IN CERTAIN INSTANCES.

C. ALL RECEPTACLES SPECIFIED FOR PERSONAL COMPUTERS, LASER PRINTERS AND SIMILAR TYPES OF EQUIPMENT SHALL BE PROVIDED WITH A SEPARATE NEUTRAL AND GROUND CONDUCTOR. THIS IS TO COMPENSATE FOR HARMONIC CURRENTS. SHARED NEUTRAL CONDUCTORS FOR THESE HOME RUNS ARE NOT PERMITTED, UNLESS OTHERWISE NOTED.

D. THE ELECTRICAL CONTRACTOR SHALL CONFIRM THE CONFIGURATION TYPE FOR ALL SPECIAL RECEPTACLES FOR COPIERS, DATA PROCESSING EQUIPMENT, ETC. WITH OWNER AND ENGINEER PRIOR TO ORDERING.

E. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD, TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.

F. MECHANICAL EQUIPMENT IS LOCATED ABOVE THE HUNG CEILING UNLESS OTHERWISE NOTED. EXACT LOCATION SHALL BE DETERMINED FROM MECHANICAL DRAWINGS.

G. EXACT LOCATIONS FOR ALL FIRE SMOKE DAMPERS, MOTORIZED DAMPERS, DUCT MOUNTED SMOKE DETECTORS & MECHANICAL EQUIPMENT SHALL BE DETERMINED FROM THE MECHANICAL DRAWINGS. COORDINATE WITH MECHANICAL CONTRACTOR IN FIELD.

H. WHERE APPLICABLE, RUN 1" EMPTY CONDUIT TO NEAREST ACCESSIBLE HUNG CEILING WITH GROMMET END FITTINGS FOR TELEPHONE/DATA & PROVIDE DRAG LINES FOR PULLING CABLE.

I. COORDINATE THE HARDWARE REQUIREMENTS FOR THE DOORS WITH THE ARCHITECT & SECURITY CONSULTANT PRIOR TO INSTALLATION (I.E. ELECTRIC HINGES, CARD READERS, ELECTRIC STRIKES, MAGNETIC SWITCHES, POWER SUPPLIES, ETC.) PROVIDE A BACKBOX WITH 1" CONDUIT WITH DRAG LINES STUBBED UP ABOVE CEILING FOR ALL LOW VOLTAGE DEVICES SUCH AS CARD READERS, MAGNETIC LOCKS, ELECTRIC LOCKSET, ELECTRIC STRIKE, ETC.

J. ALL BRANCH CIRCUIT HOME RUNS SHALL BE 2#12 & 1#12 GND IN 3/4" CONDUIT OR MC CABLE TO PANEL & CIRCUIT INDICATED. MAXIMUM OF THREE HOME RUNS PER CONDUIT.

K. MULTIWIRE BRANCH CIRCUITS SUPPLYING POWER TO FURNITURE PARTITIONS SHALL BE PROVIDED WITH MEANS TO DISCONNECT POWER SIMULTANEOUSLY.

L. ELECTRICAL CONTRACTOR SHALL PROVIDE A BACKBOX AND 1" EMPTY CONDUIT WITH DRAG LINE FOR ALL IN-WALL WIRED KEYPADS AND TOUCHSCREENS. REFER TO LOW VOLTAGE DRAWINGS FOR EXACT LOCATIONS AND SPECIFICATIONS.

M. ELECTRICAL CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS, PLUMBING DRAWINGS, AND COORDINATE WITH MECHANICAL CONTRACTOR AND PLUMBING CONTRACTOR FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT. PROVIDE DISCONNECT SWITCHES AND CIRCUITING SIZED PER THEIR EQUIPMENT SCHEDULES. HEAT TRACE CIRCUITS SHALL BE PROTECTED BY 30mA GROUND FAULT TYPE CIRCUIT BREAKERS. PROVIDE (3) FIRE ALARM MONITOR MODULES FOR EACH HEAT TRACE CONTROLLER SERVING SPRINKLER PIPES. PROVIDE (4) MONITOR MODULES FOR EACH DRY PIPE COMPRESSOR.

N. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH AUDIO/VISUAL, TELECOM, AND SECURITY DRAWINGS AND CONTRACTORS FOR ANY ADDITIONAL BACKBOX, CONDUIT, AND POWER REQUIREMENTS.

O. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE THE VOLTAGE, PHASE, AND HORSEPOWER OF ALL ELECTRICAL EQUIPMENT PURCHASED AND SUPPLIED TO THE SITE. ELECTRICAL CONTRACTOR SHALL SUPPLY FUSES OR CIRCUIT BREAKERS PER MANUFACTURER'S RECOMMENDATIONS WHERE NECESSARY.

P. ELECTRICAL CONTRACTOR SHALL PROVIDE A COMPLETE TYPEWRITTEN PANEL SCHEDULE DIRECTORY AT PROJECT COMPLETION OF ALL CIRCUITS UTILIZED, IDENTIFYING THE LOADS THAT THEY ARE SERVING.

Q. ALL JUNCTION BOXES AND DISCONNECT SWITCH LOCATIONS SHALL BE COORDINATED IN THE FIELD. JUNCTION BOXES AND DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT ABOVE CEILINGS SHALL BE INSTALLED SO THAT THEY ARE ACCESSIBLE FROM ACCESS PANELS. COORDINATE WITH MECHANICAL CONTRACTOR.

R. ELECTRICAL CONTRACTOR SHALL INSTALL ALL STARTERS, AND VARIABLE FREQUENCY DRIVES (FURNISHED BY MECHANICAL CONTRACTOR); AND PROVIDE CONDUIT AND WIRING TO AND FROM STARTERS AND VFDs TO MECHANICAL EQUIPMENT AND/OR ITS ASSOCIATED DISCONNECT SWITCHES. COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATIONS AND REQUIREMENTS.

S. ELECTRICAL CONTRACTOR SHALL INCLUDE IN BASE BID (2) 15T, 20A, 120V CIRCUITS FROM NEAREST PANEL PER FLOOR FOR HVAC SYSTEM CONTROLS. COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATIONS AND REQUIREMENTS.

T. ALL POWER AND LIGHTING CIRCUITS, AND LOW VOLTAGE CABLING (VOICE/DATA, FIRE ALARM, LIGHTING CONTROLS, AUDIO/VISUAL, HVAC CONTROLS, ETC.) ROUTED THROUGH EXPOSED CEILINGS SHALL BE IN EMT CONDUIT. COORDINATE INSTALLATION WITH OTHER TRADES. REFER TO ARCHITECTURAL AND INTERIOR DESIGNER DRAWINGS FOR LOCATIONS OF EXPOSED CEILINGS.

U. ELECTRICAL CONTRACTOR SHALL PROVIDE (3) #12 WIRE IN 3/4" CONDUIT FROM DX SPLIT OUTDOOR AIR-COOLED CONDENSING UNITS TO DX SPLIT INDOOR UNITS. COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATIONS AND REQUIREMENTS.

V. ELECTRICAL CONTRACTOR SHALL PROVIDE LOCKABLE FUSIBLE DISCONNECT SWITCHES WITH AUXILIARY CONTACTS FOR ELEVATOR CONTROLLERS AND MOTORS. COORDINATE EXACT LOCATIONS AND REQUIREMENTS WITH ELEVATOR CONTRACTOR.

W. AUTOMATIC TRANSFER SWITCHES (ATS) SHALL HAVE MANUAL START/STOP CONTROL OVER THE EMERGENCY GENERATOR. PROVIDE (1) 1" EMPTY CONDUIT WITH DRAG LINE FROM EACH ATS TO GENERATOR CONTROL PANEL FOR CONTROL WIRING. COORDINATE EXACT WIRING REQUIREMENTS WITH MANUFACTURER.

X. GENERATOR ANNUNCIATOR PANEL (GAP) IN FIRE COMMAND CENTER SHALL BE CAPABLE OF MANUAL START/STOP OF THE EMERGENCY GENERATOR. PROVIDE (1) 1" EMPTY CONDUIT WITH DRAG LINE FROM GAP TO ALL ATS FOR CONTROL WIRING. PROVIDE (1) 1" EMPTY CONDUIT WITH DRAG LINE FROM OTHER GAPS TO GENERATOR CONTROL PANEL. COORDINATE EXACT WIRING REQUIREMENTS WITH MANUFACTURER.

Y. WHERE RECEPTACLES SHOWN OUTDOORS CANNOT BE WALL MOUNTED, PROVIDE A RECEPTACLE BOLLARD, B-K LIGHTING #RB-18-RE1 (FINISH BY ARCHITECT).

Z. ALL RECEPTACLES WITHIN 6' OF THE EDGE OF SINKS, OR INSTALLED ON COUNTERTOPS SHALL BE PROVIDED WITH GROUND FAULT PROTECTION.

ELECTRICAL LIGHTING NOTES

A. FOR EXACT ELEVATION, LOCATION, QUANTITY AND SPECIFICATIONS OF LIGHTING FIXTURES AND SWITCHES REFER TO ARCHITECTURAL AND INTERIOR DESIGNER'S DRAWINGS AND COORDINATE WITH ARCHITECT IN THE FIELD.

B. LIGHTING FIXTURES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH FIXTURE. CIRCUITRY MAY BE SHOWN IN CERTAIN INSTANCES.

C. ALL JUNCTION OR OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO COVER. PROVIDE ARCHITECT APPROVED ACCESS DOORS OR PLATES AS REQUIRED IN AREAS WHERE UNOBSTRUCTED ACCESS TO BOX OR OUTLET IS NOT POSSIBLE.

D. PRIOR TO ORDERING LIGHTING FIXTURES, COORDINATE WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. IF DISCREPANCIES EXIST BETWEEN ARCHITECTURAL AND ENGINEERING INFORMATION OBTAIN CLARIFICATION PRIOR TO PROCEEDING.

E. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.

F. MULTIPLE SWITCHES SHOWN IN SAME LOCATION SHALL BE GANGED TOGETHER WITH A COMMON FACEPLATE.

G. ALL LIGHTING FIXTURES CONTROLLED BY DIMMER SWITCHES SHALL BE PROVIDED WITH DEDICATED NEUTRAL CONDUCTOR.

H. ALL NIGHT LIGHTS AND STAIR LIGHTS SHALL BE UNSWITCHED AND CIRCUITED DIRECTLY TO ASSOCIATED ELECTRICAL PANELS, U.O.N.

I. BRANCH CIRCUIT BREAKERS FEEDING STAIR LIGHTS SHALL BE LOCKED IN "ON" POSITION.

J. ALL LIGHT FIXTURES DESIGNATED WITH "EM" SHALL BE CIRCUITED TO A GENERATOR EMERGENCY LIGHTING PANEL.

K. ALL LIGHT FIXTURES DESIGNATED WITH "EMB" SHALL BE PROVIDED WITH EMERGENCY BATTERY PACK CAPABLE OF FULL LIGHT OUTPUT FOR MINIMUM 90 MINUTES.

L. ELECTRICAL CONTRACTOR SHALL PROVIDE A FIRE RATED BARRIER (CONTRAST LIGHTING #FRB2) FOR ALL RECESSED LIGHTING FIXTURES INSTALLED IN FIRE RATED CEILINGS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS.

M. EXTERIOR LIGHTING SHALL BE CONTROLLED BY PHOTOCELLS AND TIMECLOCKS WITH A MANUAL OVERRIDE SWITCHES LOCATED IN ELECTRICAL ROOMS.

N. REFER TO ARCHITECTURAL, CIVIL, INTERIOR DESIGNER, AND LANDSCAPE DRAWINGS FOR LIGHTING LAYOUTS, AND LIGHTING FIXTURE SCHEDULE. THEIR DRAWINGS SHALL SUPERSIDE THE LIGHTING LAYOUTS ON THESE DRAWINGS. ELECTRICAL CONTRACTOR SHALL PROVIDE CIRCUITING AS REQUIRED BASED ON THEIR LAYOUTS.

O. EACH LIGHT FIXTURE TYPE SHALL BE ON A SEPARATE DIMMER SWITCH (VIA LUTRON DIMMING POWER PACKS). DIMMING ZONES ARE DENOTED BY LOWERCASE LETTER NEXT TO FIXTURE AND SWITCH (a, b, c, ETC.)

P. ELECTRICAL CONTRACTOR SHALL PROVIDE 0-10V CONVERTERS FOR FIXTURES WITHOUT 0-10V DIMMING DRIVERS.

Q. CORRIDOR LIGHTING NOT DESIGNATED WITH "EM" SHALL BE CONTROLLED BY OCCUPANCY SENSORS. PROVIDE RELAY MODULES AS REQUIRED. COORDINATE WITH MANUFACTURER FOR QUANTITY.

R. PROVIDE ON-SITE VISITS BY CONTROL SYSTEM VENDOR'S APPLICATION ENGINEER AND SYSTEMS PROGRAMMER TO INSPECT, START-UP, COMMISSION, AND PROGRAM THE LIGHTING SYSTEM(S) IN ORDER TO PROVIDE A COMPLETE, FULLY-FUNCTIONING LIGHTING SYSTEM.

S. PROVIDE SIXTEEN (16) HOURS INSTRUCTION TO THE OWNER'S REPRESENTATIVE DESIGNATED STAFF ON THE USE, OPERATION AND MAINTENANCE OF THE SYSTEM, SCHEDULED AS A MINIMUM OF TWO (2) SEPARATE SESSIONS. BY AN INSTRUCTOR FULLY KNOWLEDGEABLE AND QUALIFIED IN SYSTEM OPERATION. THE SYSTEM REFERENCE MANUALS SHOULD BE COMPLETE AND AVAILABLE DURING THESE DEMONSTRATIONS/INSTRUCTIONS.

T. WHERE NORMAL AND EMERGENCY FIXTURES ARE CONTROLLED BY A COMMON SWITCH(ES), PROVIDE GENERATOR TRANSFER DEVICES PER LIGHTING ZONE.

MDF/IDF ROOM NOTES

A. ONE WALL SHALL BE COVERED WITH 3/4" EXTERIOR GRADE PLYWOOD, PREFERABLE VOID FREE. PLYWOOD SHALL BE FIRE-RATED TO MEET APPLICABLE CODES AND SHALL BE PAINTED ON ALL SIX SIDES WITH TWO COATS OF FIRE RETARDANT PAINT. MOUNT 6" ABOVE FLOOR TO A HEIGHT OF 8'-6" HORIZONTALLY ON WALL.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL GROUND BUS BAR MOUNTED AT 96" A.F.F. (1) #4W, CU. IN 3/4" CONDUIT TO COLD WATER MAIN/BUILDING STEEL. INTERCONNECT TO STATIC DISSIPATING FLOOR, I/O CABINET(S)/RACK(S) AND CABLE /LADDER TRAYS. PROVIDE #6W., CU. JUMPER BETWEEN JOINTS.

C. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH TENANT'S "IT" AND SECURITY VENDOR PERSONNEL FOR ALL POWER REQUIREMENTS (RECEPTACLE CONFIGURATIONS, ETC.) AND EXACT LOCATIONS OF ALL RECEPTACLES INDICATED ON PLAN.

SITE PLAN NOTES

A. CONDUIT ROUTING IS DIAGRAMMATIC AND IS NOT REPRESENTATIVE OF EXACT FIELD CONDITIONS. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT ROUTING IN FIELD DURING CONSTRUCTION.

B. ALL CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED AND BURIED 18" MINIMUM BELOW GRADE AND 24" MINIMUM BELOW GRADE UNDER PARKING LOT AND ROADWAY. SERVICE ENTRANCE CONDUIT SHALL BE 24" MINIMUM BELOW GRADE. MATERIAL FOR BACKFILLING SHALL BE EARTH MATERIALS ENTIRELY FREE FROM VEGETATION, TRASH, LUMBER, AND FROZEN; SOFT OR ORGANIC MATERIALS. NO STONES OR ROCK LARGER THAN 1" WILL BE PERMITTED IN THE FILL.

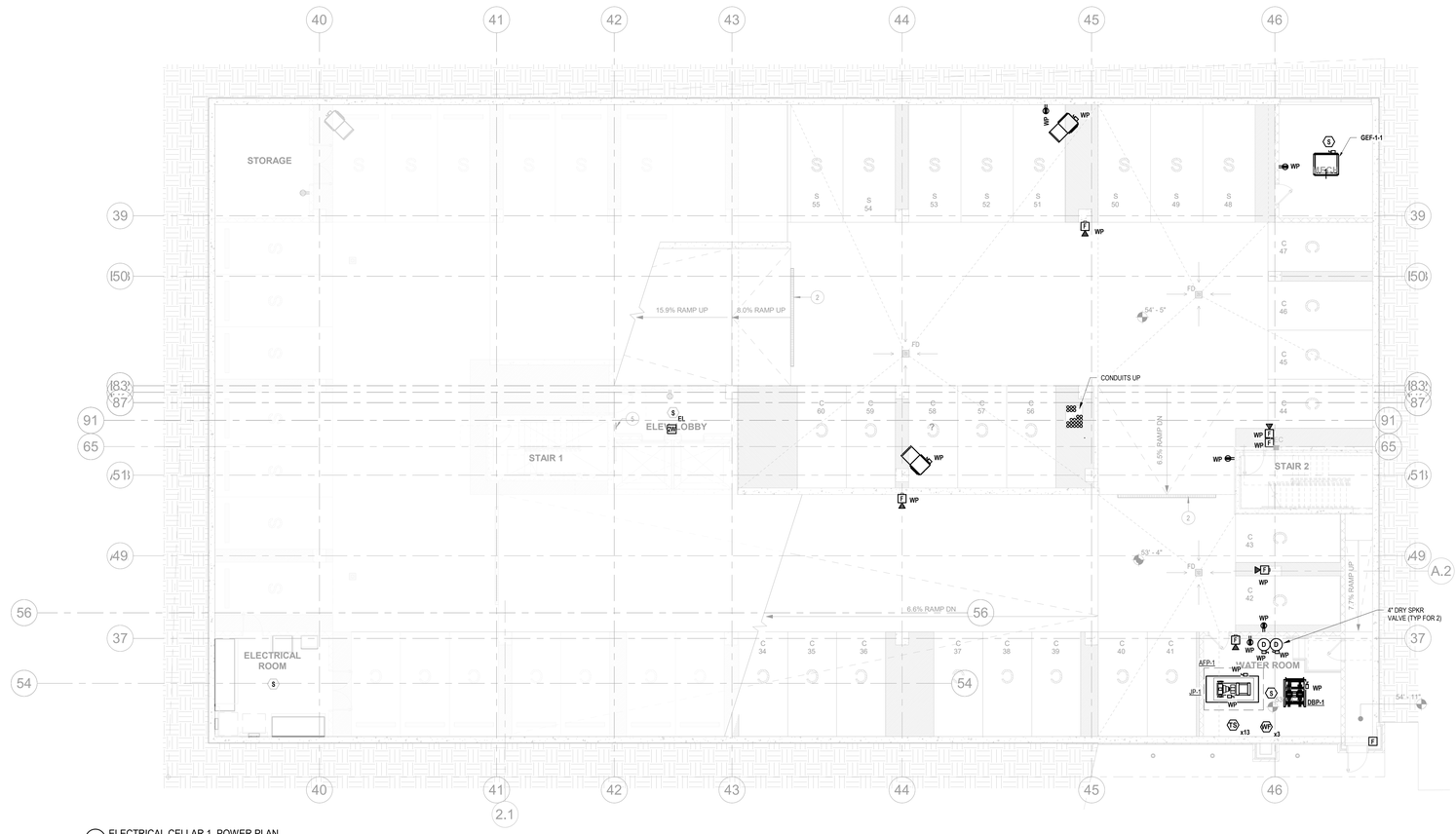
C. ELECTRICAL CONTRACTOR SHALL PROVIDE HAND HOLES AS REQUIRED, SIZED PER NEC.

D. TRENCHING FOR CONDUITS SHALL BE KEPT TO A MINIMUM WIDTH TO ACCOMMODATE ONLY THE NUMBER OF CONDUITS REQUIRED. A RED CAUTION TAPE SHALL BE PLACED ALONG LENGTH OF TRENCH AT A MINIMUM OF 6-10" BELOW FINISHED GRADE BUT NO CLOSER THAN 12" TO THE BURIED CONDUITS. UNDERGROUND-TYPE PLASTIC LINE MARKER NOT LESS THAN 6" WIDE AND 4 MILS THICK.

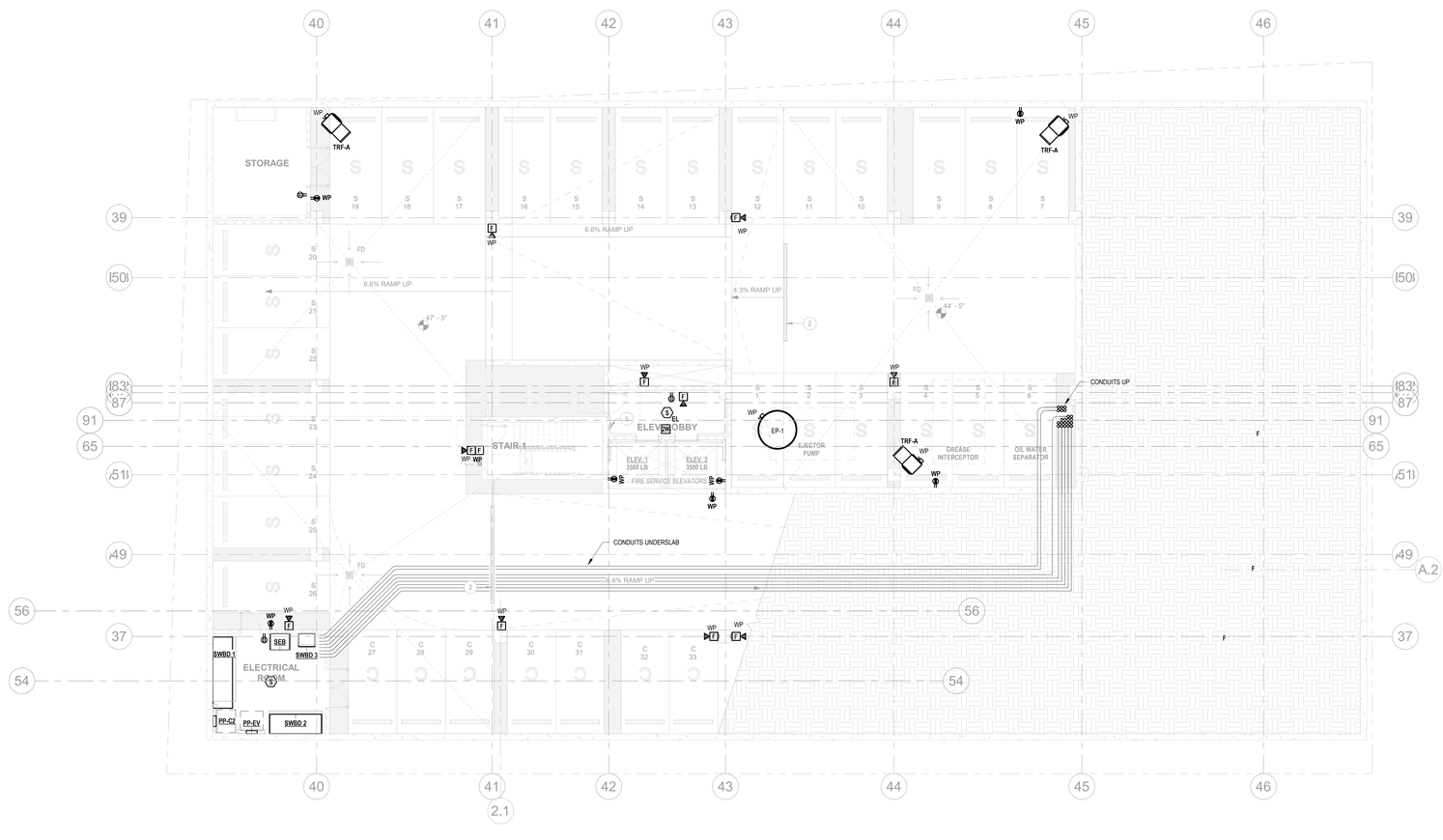
E. ALL EXTERIOR LIGHTING CIRCUITS SHALL BE 2#10 + 1#10 GRD IN 3/4" CONDUIT. LIGHTING FIXTURES SHALL BE CONTROLLED VIA TIMECLOCK & PHOTOCELL.

ELECTRICAL - IT/AV/SECURITY COORDINATION NOTE

1. ELECTRICAL CONTRACTOR SHALL REFER TO IT/AV/SECURITY DRAWINGS AND COORDINATE WITH IT/AV/SECURITY CONSULTANT/VENDOR AND ARCHITECT/INTERIOR DESIGNER TO PROVIDE THE FOLLOWING:
   - 1.1. SERVICE ENTRANCE CONDUITS AND CONDUITS BETWEEN MDF AND IDF ROOMS - TYPE, SIZE, QUANTITY, SPACING, AND ROUTING
   - 1.2. BACKBOXES - TYPE, SIZE, HEIGHT, AND LOCATIONS
   - 1.3. EQUIPMENT



1 ELECTRICAL CELLAR 1 POWER PLAN
1/8" = 1'-0"



2 ELECTRICAL CELLAR 2 POWER PLAN
1/8" = 1'-0"

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ELECTRICAL CELLAR 2 & CELLAR 1 FLOOR POWER PLANS

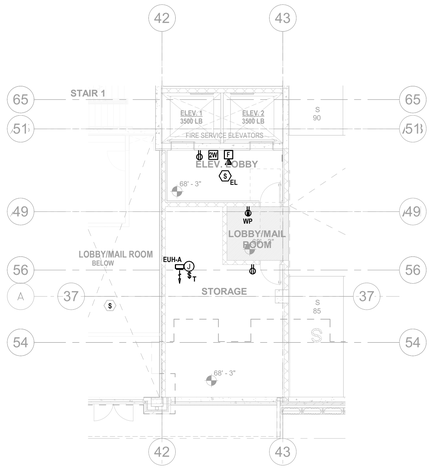
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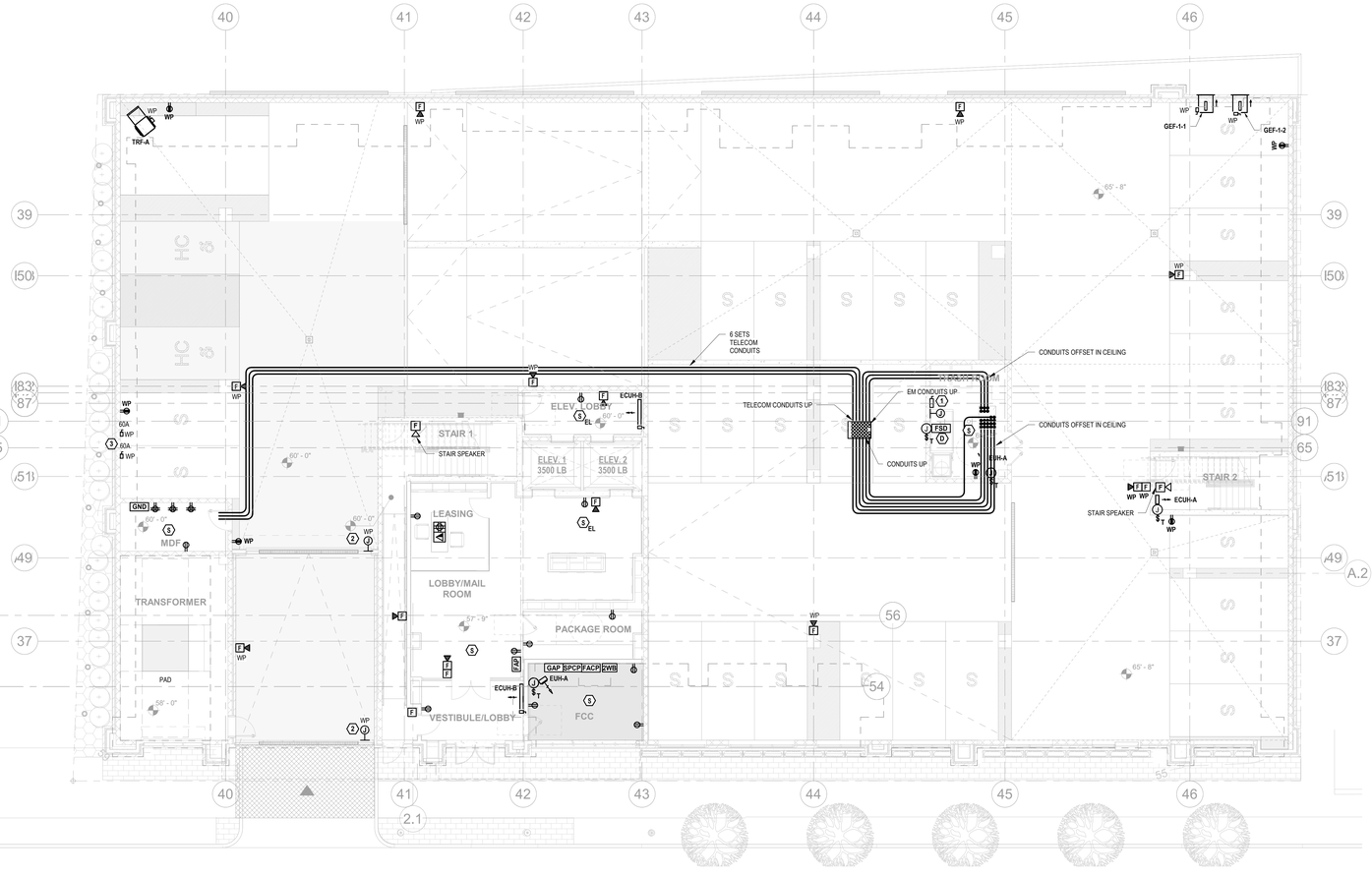
E-101

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3 ELEV. LOBBY & STORAGE @ 68'-3"
1/8" = 1'-0"



2 ELECTRICAL 1ST FLOOR POWER PLAN
1/8" = 1'-0"

POWER KEY NOTES:

1. ELECTRICAL CONTRACTOR SHALL PROVIDE A 20A, 120V CIRCUIT FOR TRASH CHUTE INTERLOCK DOOR CONTROLLER AND A 20A, 120V CIRCUIT FOR TRASH COMPACTOR CONTROL PANEL. PROVIDE WIRING AS REQUIRED BETWEEN CONTROL PANEL AND TRASH CHUTE ELECTRONIC BOXES LOCATED IN TRASH ROOMS ON EACH FLOOR. COORDINATE WITH VENDOR FOR EXACT REQUIREMENTS AND SPECIFICATIONS.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE POWER FOR MOTORIZED GARAGE DOORS. PROVIDE BOXES, CONDUIT, AND WIRING TO GATE ACCESS CONTROLS AS REQUIRED PER MANUFACTURER'S INSTALLATION REQUIREMENTS.
3. POWER FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT. COORDINATE WITH OWNER FOR EXACT EQUIPMENT TO BE INSTALLED. COORDINATE INSTALLATION REQUIREMENTS WITH EVSE MANUFACTURER.

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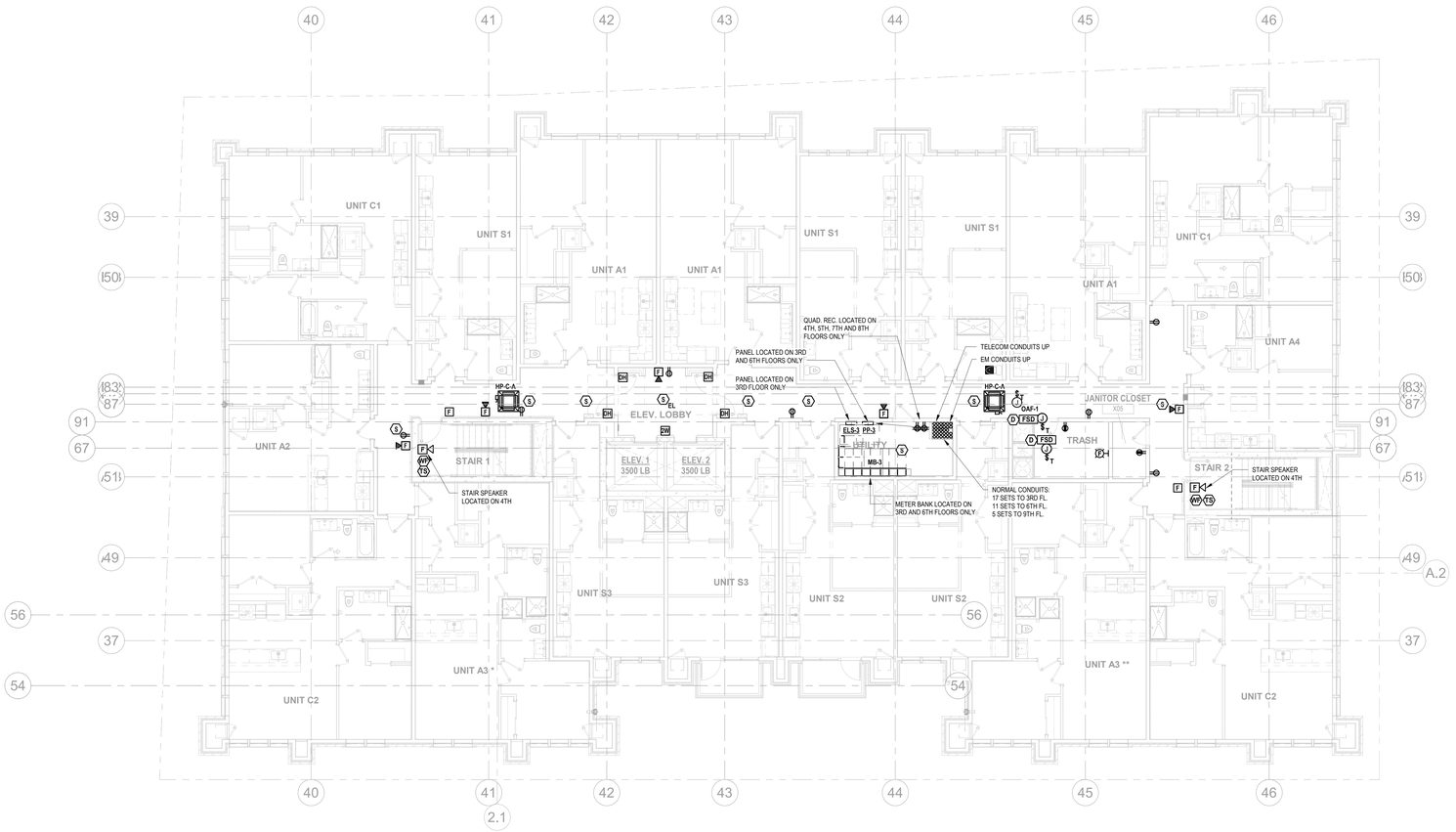
ELECTRICAL FIRST FLOOR & UPPER ELEVATOR LOBBY POWER PLANS

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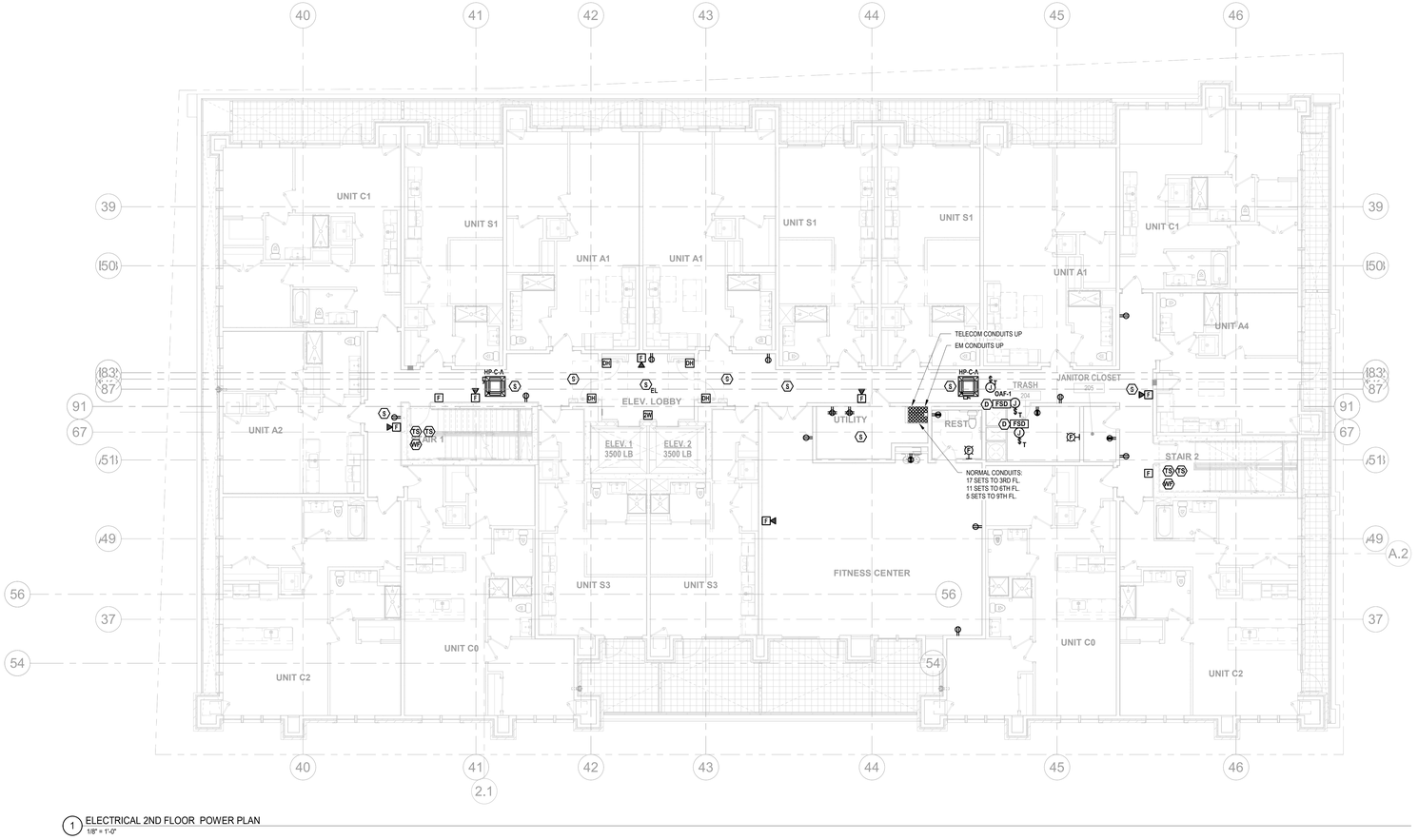
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E-102

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2 ELECTRICAL 3RD-7TH FLOOR POWER PLAN
1/8" = 1'-0"



1 ELECTRICAL 2ND FLOOR POWER PLAN
1/8" = 1'-0"

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ELECTRICAL 2ND & TYPICAL (3RD-7TH) FLOOR POWER PLANS

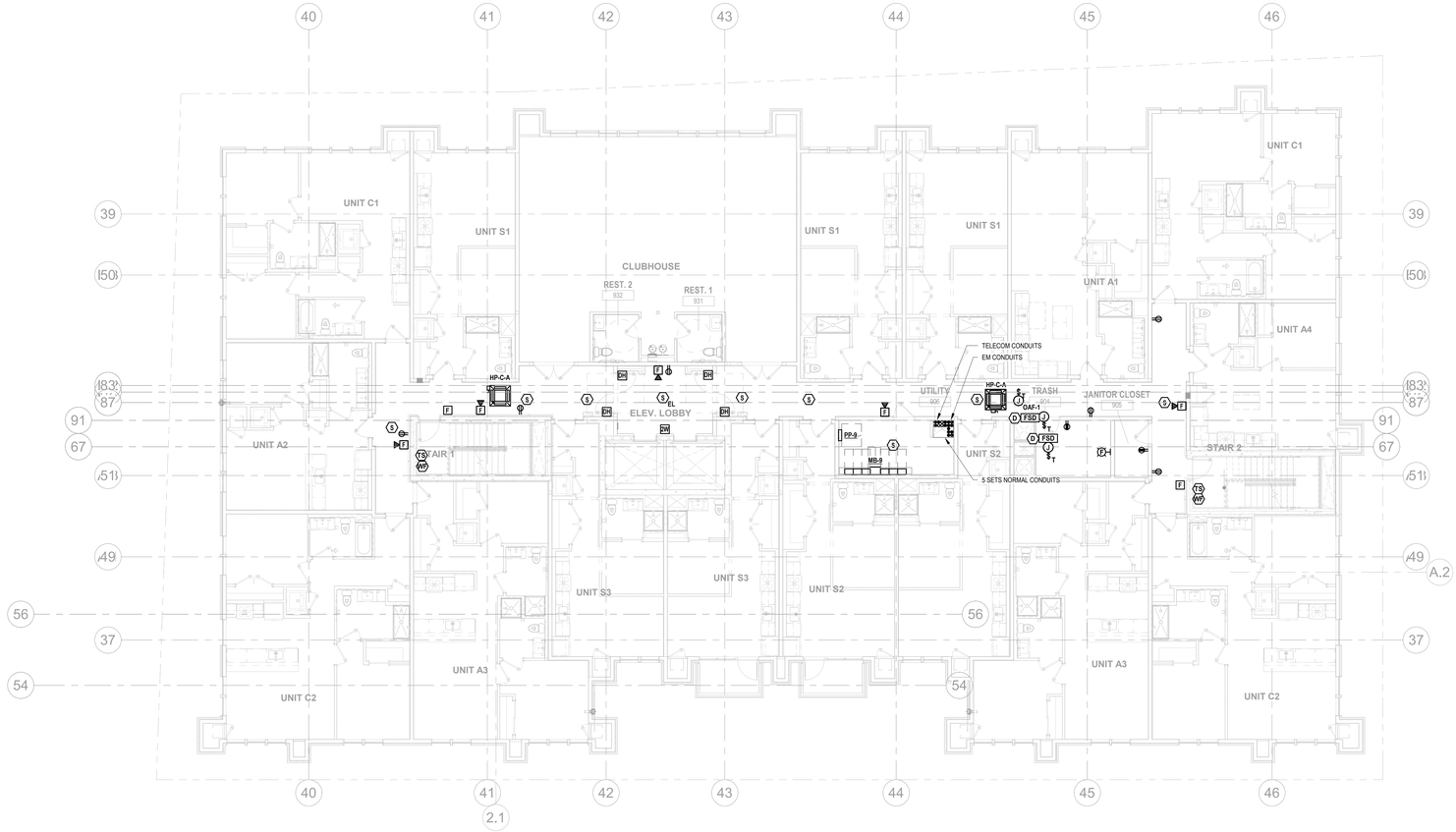
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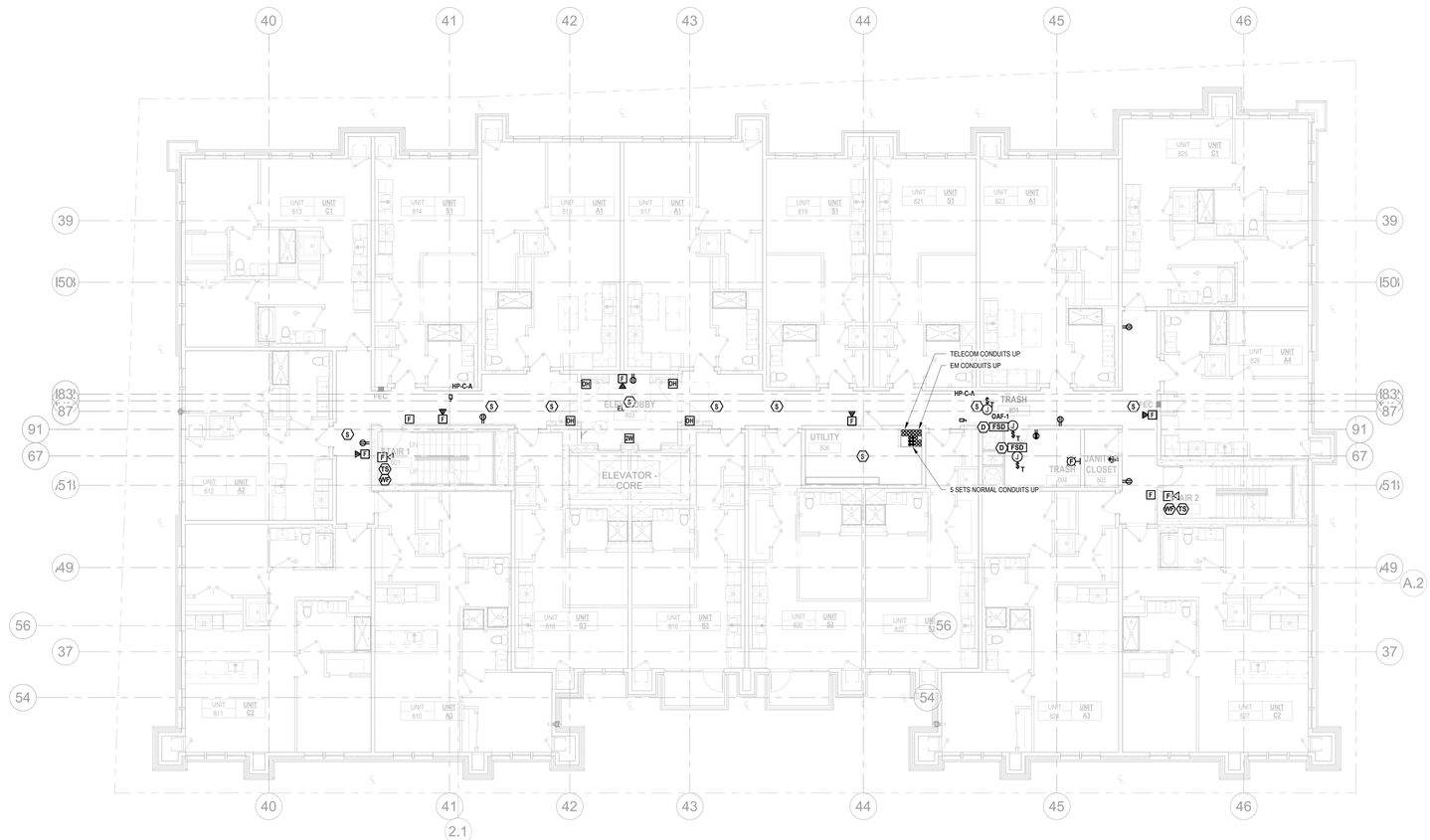
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2 ELECTRICAL 9TH FLOOR POWER PLAN
1/8" = 1'-0"



1 ELECTRICAL 8TH FLOOR PLAN
1/8" = 1'-0"

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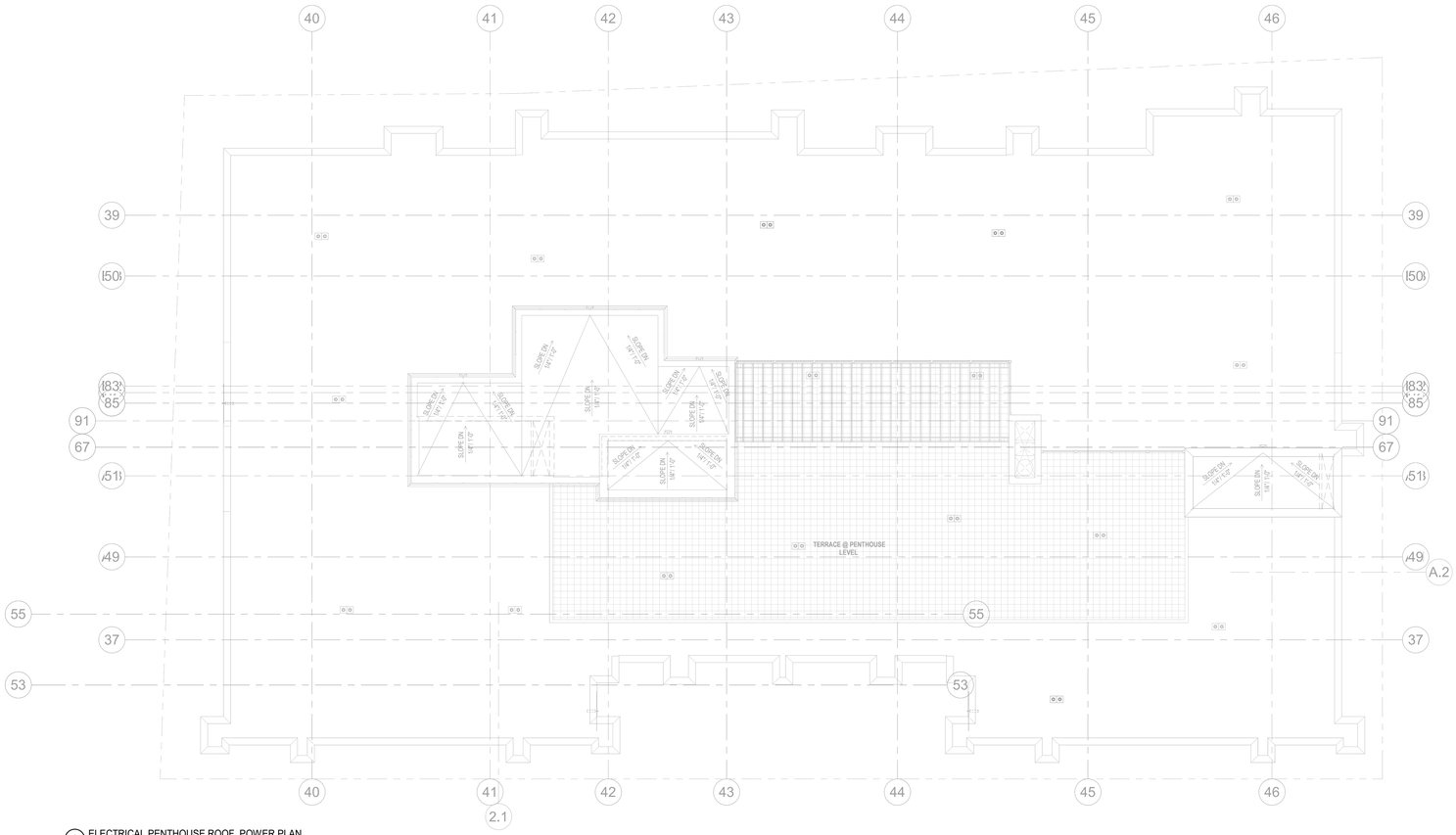
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ELECTRICAL 8TH & 9TH FLOOR POWER PLANS

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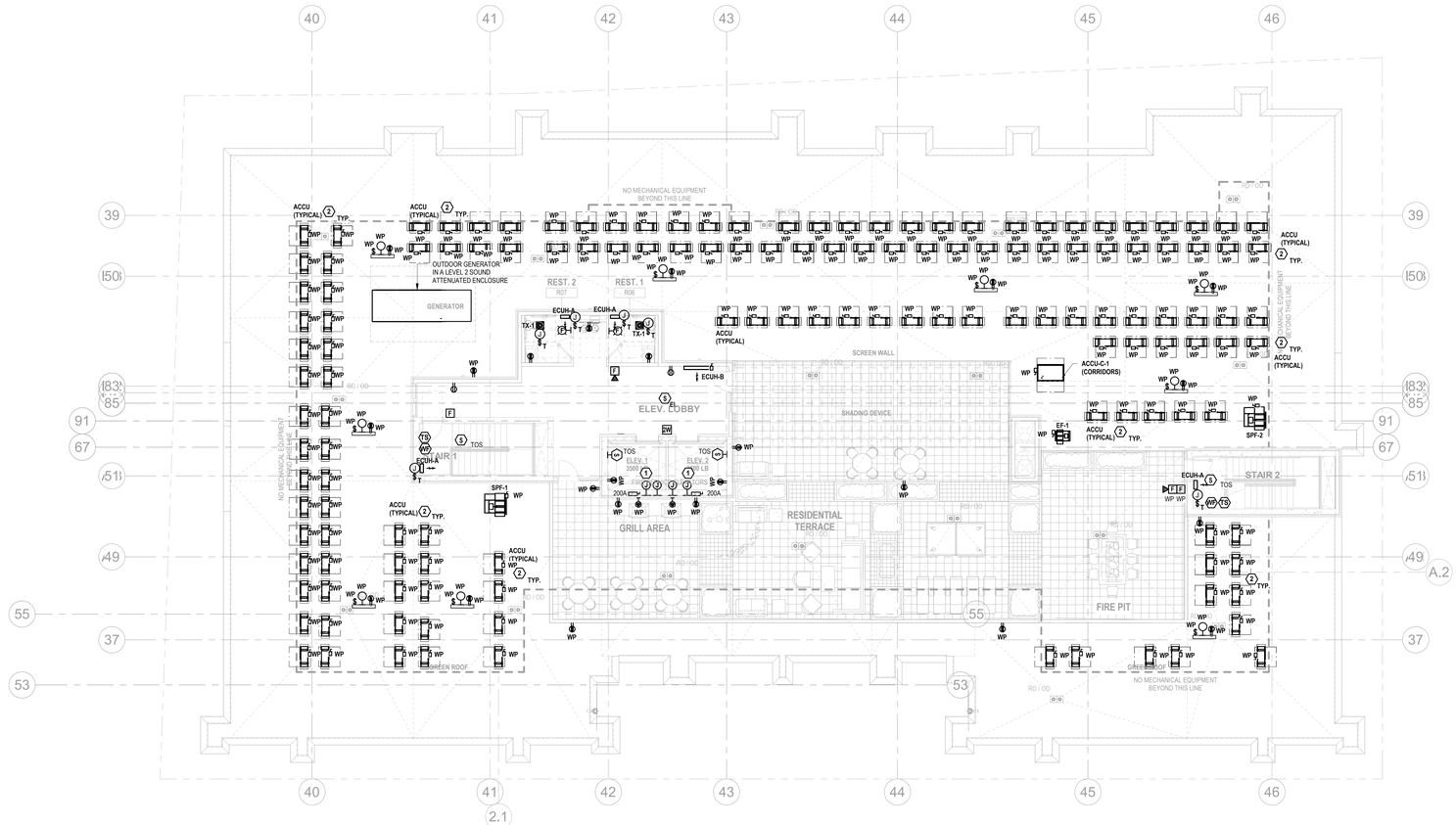
E-104



2 ELECTRICAL PENTHOUSE ROOF POWER PLAN
1/8" = 1'-0"

POWER KEY NOTE:

1. ELECTRICAL CONTRACTOR SHALL PROVIDE LOCKABLE DISCONNECT SWITCHES FOR ELEVATOR CONTROLLERS AND MOTORS. COORDINATE EXACT LOCATIONS WITH ELEVATOR CONTRACTOR. PROVIDE (1) 1 1/4" CONDUIT TO MDF ROOM FOR TELEPHONE LINE. (TYPICAL)
2. CIRCUIT APARTMENT UNIT CONDENSING UNITS RO THEIR RESPECTIVE APARTMENT UNIT LOAD CENTERS. PROVIDES 30A UNFUSED WEATHERPROOF DISCONNECT SWITCHES. REFER TO TYPICAL UNIT PLANS AND APARTMENT UNIT PANEL SCHEDULES FOR ADDITIONAL INFORMATION.



1 ELECTRICAL BUILDING ROOF POWER PLAN
1/8" = 1'-0"

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ELECTRICAL BUILDING ROOF & PENTHOUSE ROOF POWER PLANS

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UNIT PLAN NOTES:

1. ALL 120V 15A OR 20A CIRCUIT BREAKERS SHALL BE ARC FAULT CIRCUIT INTERRUPTER TYPE.

2. ALL 120V 15A OR 20A RECEPTACLES IN LAUNDRY ROOMS OR AREAS, WITHIN 6' OF THE EDGE OF SINKS, OR INSTALLED ON KITCHEN COUNTERTOPS SHALL BE PROVIDED WITH GROUND FAULT PROTECTION.

3. ALL RECEPTACLES SHALL BE TAMPER RESISTANT TYPE.

4. KITCHEN ISLAND OUTLETS SHALL HAVE PANCAKE BOXES AND BE INTEGRATED INTO CABINETS. PROVIDE CONDUIT DOWN FROM LOAD CENTER AND ROUTED IN CEILING CAVITY OF FLOOR BELOW TO KITCHEN ISLAND.

5. UNIT LOAD CENTERS SHALL BE MOUNTED SO THAT THE HEIGHT OF TALLEST CIRCUIT BREAKER IS 48" MAXIMUM.

6. ELECTRICAL DEVICE HEIGHTS TO COMPLY WITH ADA. REQUIREMENTS, COORDINATE WITH ARCHITECT FOR EXACT HEIGHTS AND LOCATIONS.
   -16" AFF MINIMUM TO BOTTOM OF RECEPTACLE
   -47" AFF MAXIMUM TO TOP OF SWITCH
   -46" AFF MAXIMUM TO TOP OF COUNTERTOP RECEPTACLES & SWITCHES.

7. SYMBOLS INDICATE THE FOLLOWING WIRING:

   TV -PROVIDE (1) CAT-6E AND (1) COAX RG6

8. FOR UNITS WITH EXPOSED CEILINGS, ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CIRCUITS (POWER, LIGHTING, FIRE ALARM, LOW VOLTAGE, ETC.) IN EMT CONDUIT. COORDINATE WITH ARCHITECT.

9. ALL BACK BOXES IN DEMISING WALLS BETWEEN RESIDENTIAL UNITS SHALL BE SEPARATED BY AT LEAST 24" OR ONE FULL STUD SPACE. SEAL ALL BACK BOXES SEPARATED BY ONE FULL STUD SPACE IN DEMISING AND UNIT CORRIDOR PARTITIONS WITH FIRE-RATED PUTTY PADS.

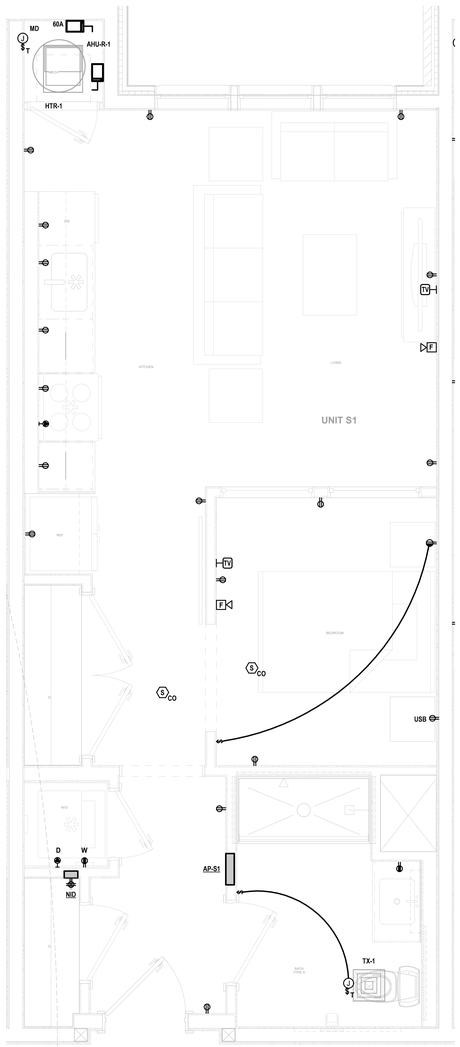
10. PROVIDE (2) MICRODUCTS WITH DRAGLINES FROM EACH NID PANEL TO THE TELECOM CLOSET SERVING THAT UNIT. COORDINATE WITH TELECOM VENDOR FOR EXACT SIZES AND REQUIREMENTS.

11. WHERE RECEPTACLES CANNOT BE INSTALLED ON WALLS AS SHOWN DUE TO STUDS, WINDOWS, ETC., PROVIDE A FLOOR RECEPTACLE WITHIN 18" OF THE WALL.

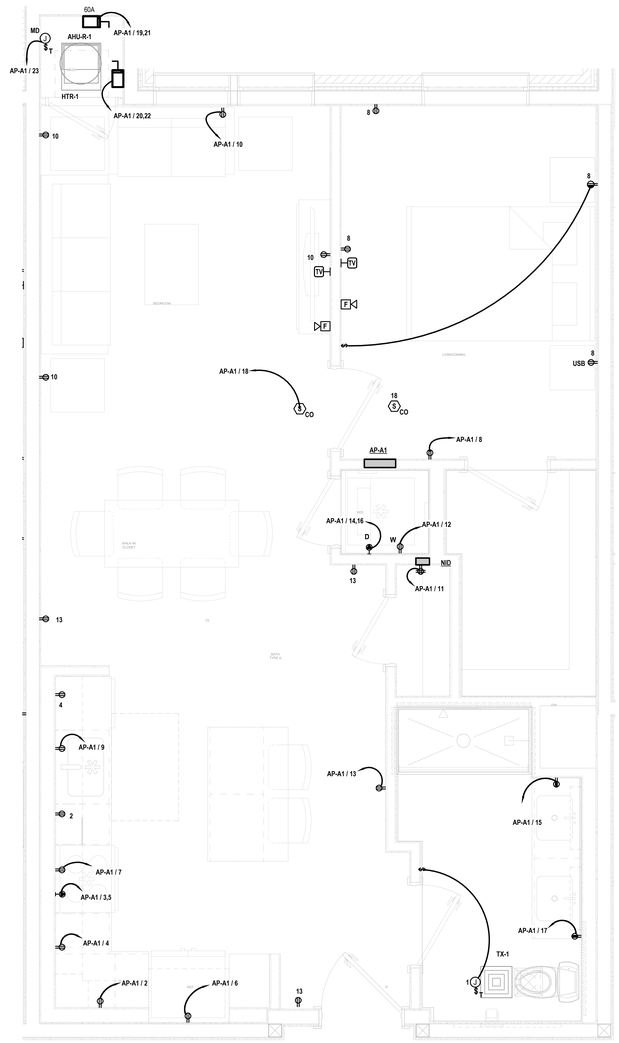
12. PROVIDE A CLOCK TYPE DUPLEX RECEPTACLE IN THE CABINET ABOVE THE RANGE FOR THE RE-CIRC HOOD IN TYPE A UNITS AND THE MICROWAVE IN TYPE B UNITS. RECEPTACLE FOR HOODS SHALL BE CONTROLLED BY A SWITCH LOCATED ADJACENT TO THE RANGE.

13. RECEPTACLE FOR THE DISHWASHER SHALL BE LOCATED IN THE CABINET BELOW THE SINK.

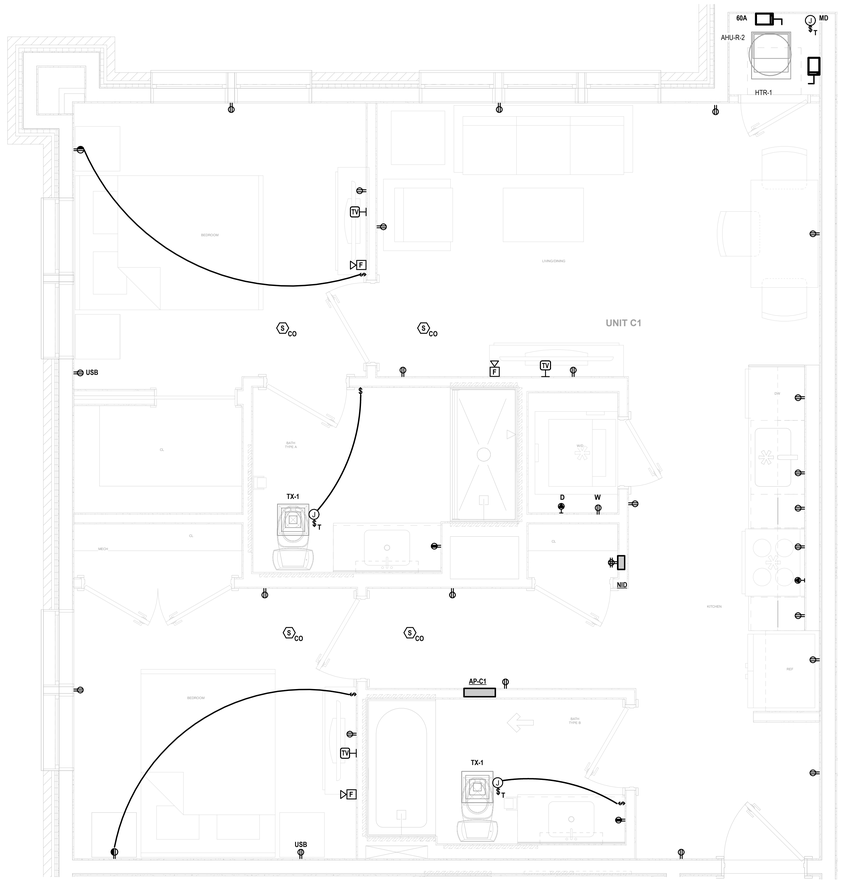
14. PROVIDE A 2-WIRE STROBE CIRCUIT IN EACH UNIT'S SPEAKER DEVICE FOR FUTURE STROBE CAPABILITY.



1 UNIT S1
1/2" = 1'-0"



2 UNIT A1
1/2" = 1'-0"



3 UNIT C1
1/2" = 1'-0"

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ELECTRICAL TYPICAL UNIT POWER PLANS

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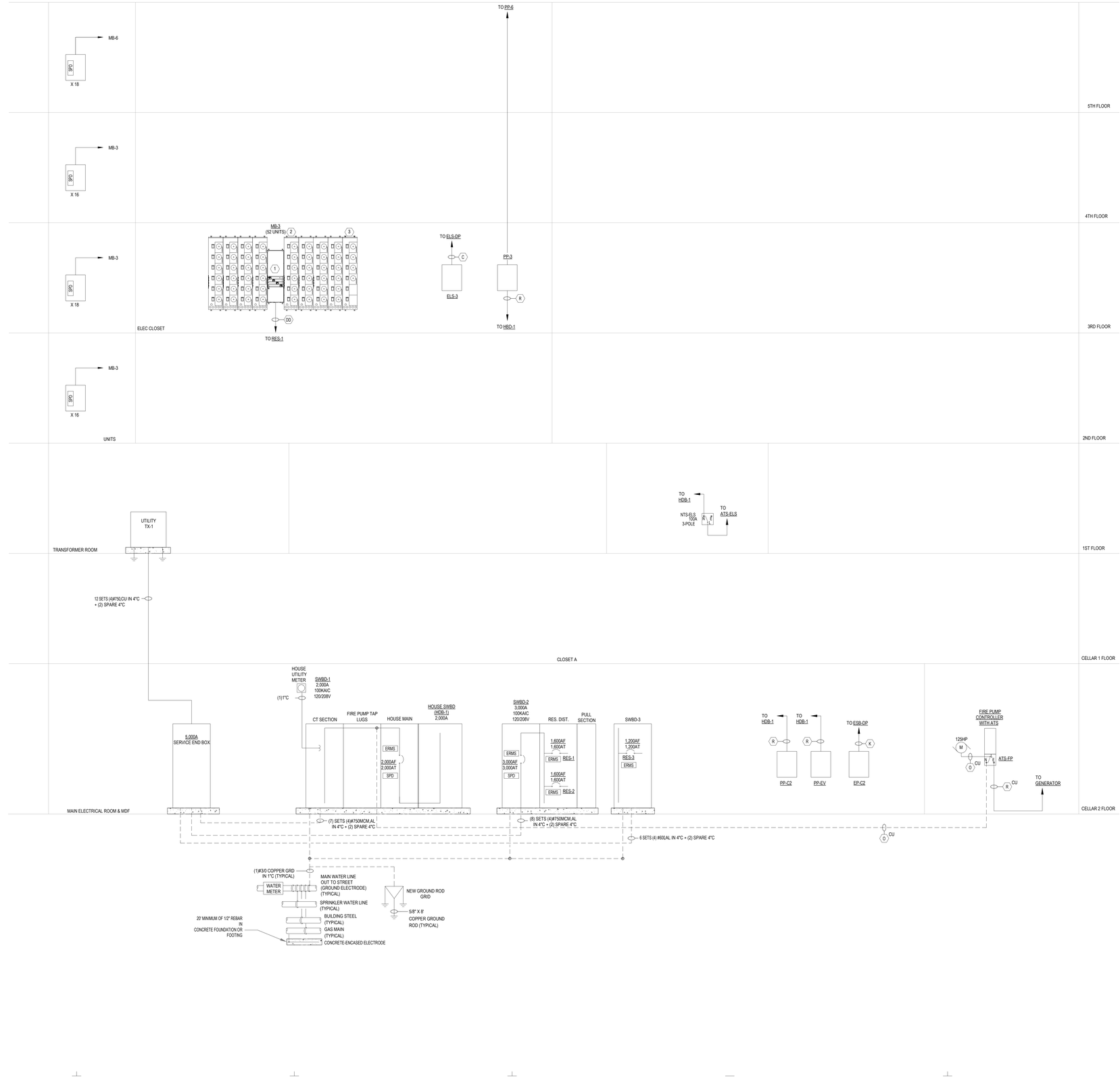
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MATCHLINE - E-501



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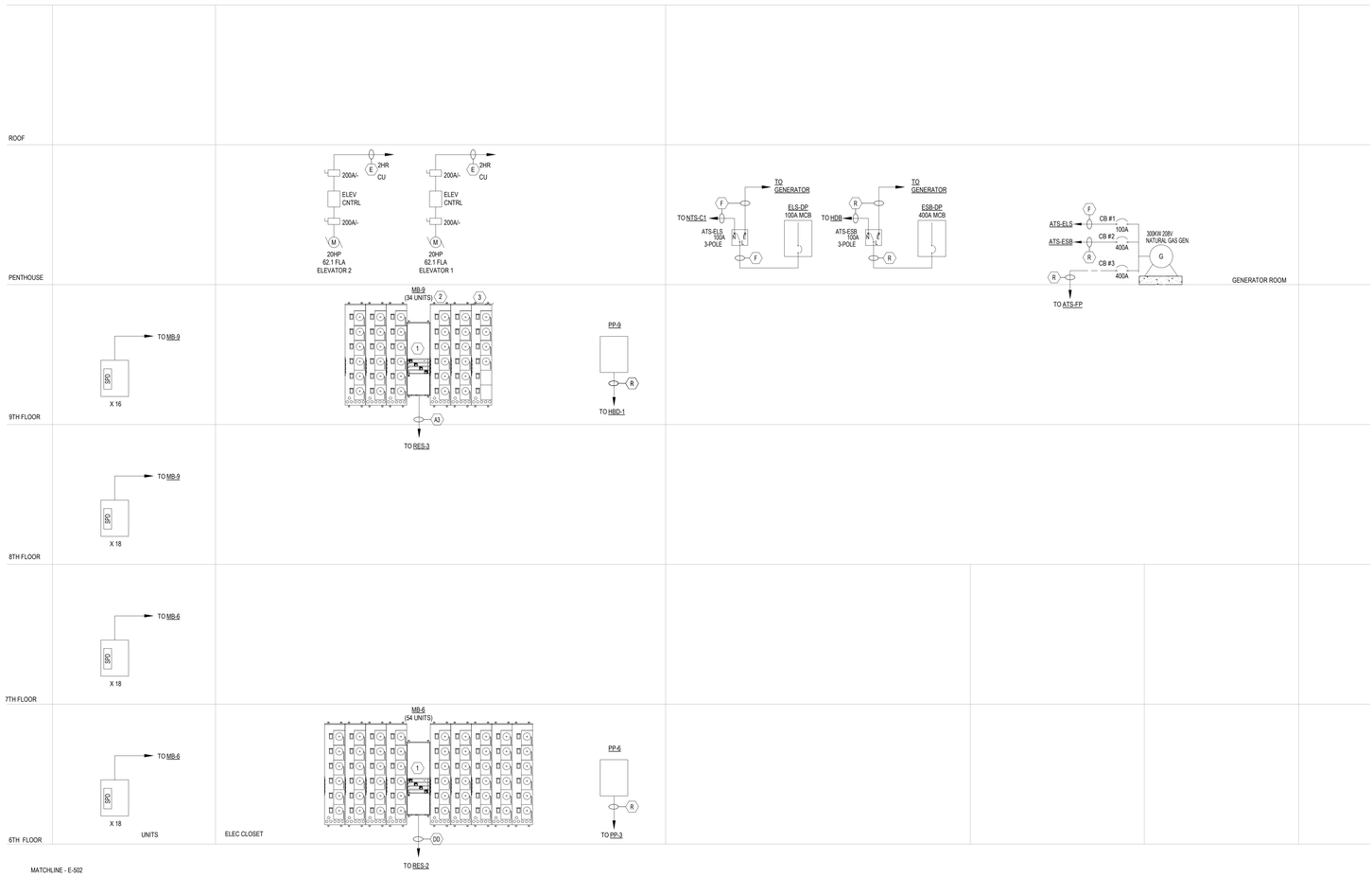
ELECTRICAL POWER RISER DIAGRAM (1 OF 2)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
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28 PEARL STREET
PORTCHESTER, NY

ELECTRICAL POWER RISER DIAGRAM (2 OF 2)

NO.	DESCRIPTION	DATE
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FILE NAME:

E-502

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POWER RISER KEY NOTES:

(1) 1600A, 208V 3Ø-4W METER CENTER TERMINAL BOX WITH FEED THRU LUG KIT, AS REQUIRED. SQUARE D #EZM31600TB & EZM1600FTLK3.

(2) 208V, 3Ø-4W INPUT / 208V, 1Ø-3W OUTPUT (6) METER STACK RINGED TYPE WITH NO BYPASS AND 125AF/125AT CIRCUIT BREAKERS. HORIZONTAL CROSS BUS SHALL BE RATED AT 800A. SQUARE D #EZM316125M10. (TYPICAL)

(3) 208V, 3Ø-4W INPUT / 208V, 1Ø-3W OUTPUT (4) METER STACK RINGED TYPE WITH NO BYPASS AND 125AF/125AT CIRCUIT BREAKERS. HORIZONTAL CROSS BUS SHALL BE RATED AT 800A. SQUARE D #EZM314125M10. (TYPICAL)

POWER RISER NOTES:

1. ALL ELECTRICAL PANELS TO BE PROVIDED WITH ALUMINUM BUSING AND LOADS TO BE PHASE BALANCED.
2. ALL ELECTRICAL FEEDERS TO BE ALUMINUM UNLESS OTHERWISE NOTED BY SUBSCRIPT "CU" AND ALL BRANCH CIRCUITING SHALL BE COPPER.
3. ALL ELECTRICAL FEEDERS (PRIMARY OR SECONDARY) RUNNING UNDER DRIVEWAY OR ROADWAY SHALL BE ENCASED IN 2" CONCRETE.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY CO. FOR REQUIREMENTS ON TRANSFORMER PAD SPECIFICATION/INSTALLATION, PRIMARY CONDUIT ROUTING AND SEQUENCING.
5. ELECTRICAL CONTRACTOR SHALL ISSUE SWITCHGEAR SHOP DRAWINGS TO LOCAL UTILITY CO. FOR APPROVAL PRIOR TO ORDERING ANY EQUIPMENT. COORDINATE AIC RATING IN AREA.
6. ELECTRICAL CONTRACTOR SHALL VERIFY VOLTAGE DROP ON FEEDERS BASED ON ROUTING OF FEEDER CHOSEN IN FIELD.
7. ELECTRICAL CONTRACTOR SHALL COORDINATE TOP OR BOTTOM FEED OF ALL SWITCHBOARDS AND PANELBOARDS.
8. ALL ELEVATOR FEEDERS, STAIR PRESSURIZATION FEEDERS, FIRE PUMP, AND EMERGENCY LIGHTING PANEL (NEC 700) FEEDERS SHALL BE 2-HR RATED COPPER CABLE. CABLE SIZES SHALL BE COORDINATED PER MANUFACTURER'S RECOMMENDATIONS.
9. PROVIDE CABLE SUPPORTS FOR ALL VERTICAL RISERS PER NEC TABLE 300.19(A).
10. PROVIDE PULL BOXES AS REQUIRED, SIZED PER NEC. PULL BOXES INSTALLED IN THE GARAGE SHALL BE STAINLESS STEEL.
11. ELECTRICAL CONTRACTOR SHALL PROVIDE THE APPROPRIATE QUANTITY/SIZE OF LUGS IN PANELBOARDS, SWITCHBOARDS, AND METER BANKS TO ACCOMMODATE THE QUANTITY/SIZE OF CONDUCTORS TO BE TERMINATED. PROVIDE PIN ADAPTERS AS REQUIRED.
12. ELECTRICAL CONTRACTOR SHALL PROVIDE BUSSED CORNER SECTIONS FOR METER BANKS AS REQUIRED. REFER TO FLOOR PLANS FOR LOCATIONS.
13. ELECTRICAL CONTRACTOR SHALL PROVIDE LIMITER LUGS FOR ALL CONDUCTOR TERMINATIONS IN THE SERVICE END BOX AND ALL SERVICE SWITCH BOARDS.
14. PROVIDE CIRCUIT BREAKERS WITH ARC FLASH REDUCTION/ENERGY REDUCING MAINTENANCE SWITCH PER NEC 2020 SECTION 240.87.
15. ELECTRICAL CONTRACTOR SHALL MOUNT PANELBOARDS, METERBANK, OR OTHER ELECTRICAL EQUIPMENT ON UNISTRUT IN FRONT OF CONDUITS AS REQUIRED.
16. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE PASSENGER ELEVATOR MANUFACTURER TO PROVIDE AN ELEVATOR SELECTOR SWITCH SO THAT ANY ONE OF THE TWO PASSENGER ELEVATORS OPERATES UNDER EMERGENCY POWER. PROVIDE CONDUIT AND WIRING AS REQUIRED. COORDINATE WITH ELEVATOR MANUFACTURER.
17. PROVIDE CIRCUIT BREAKERS WITH ARC FLASH REDUCTION/ENERGY REDUCING MAINTENANCE SWITCH PER NEC 2017 SECTION 240.87
18. ELECTRICAL CONTRACTOR SHALL PROVIDE A GROUND RISER (1)#3/0 BARE COPPER CONDUCTOR ROUTED THROUGH ALL ELECTRICAL CLOSETS ON ALL FLOORS AND TERMINATING AT MAIN SERVICE GROUNDING ASSEMBLY.
19. ELECTRICAL CONTRACTOR SHALL PROVIDE (1) 1" CONDUIT FROM THE GENERATOR TO EACH ATS AND (1) 1" CONDUIT FROM GENERATOR TO GAP FOR CONTROL. PROVIDE WIRING AND CONDUIT AS REQUIRED. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER.
20. ELECTRICAL CONTRACTOR SHALL PROVIDE A GENERATOR ANNUNCIATOR PANEL WITH PROVISIONS TO MONITOR AND CONTROL THE GENERATOR AND ALL AUTOMATIC TRANSFER SWITCHES. PROVIDE CONDUIT AND WIRING AS REQUIRED. COORDINATE EXACT REQUIREMENTS WITH GENERATOR MANUFACTURER. GENERATOR ANNUNCIATOR PANEL(S) SHALL BE LOCATED IN THE LOBBY OR IN A LOCATION APPROVED BY THE LOCAL AHJ.

FEEDER SCHEDULE
3Ø, 4W (ALUMINUM, U.O.N.)

TAG	FEEDER SIZES	RATING
A	(4) #8 & (1) #8 GRD - 1 1/4"C	40A
B	(4) #6 & (1) #8 GRD - 1 1/4"C	50A
C	(4) #4 & (1) #6 GRD - 1 1/2"C	65A
D	(4) #3 & (1) #6 GRD - 1 1/2"C	75A
E	(4) #2 & (1) #6 GRD - 2"C	90A
F	(4) #1 & (1) #6 GRD - 2"C	100A
G	(4) #1/0 & (1) #4 GRD - 2 1/2"C	120A
H	(4) #2/0 & (1) #4 GRD - 2 1/2"C	135A
I	(4) #3/0 & (1) #4 GRD - 2 1/2"C	155A
J	(4) #4/0 & (1) #4 GRD - 3"C	180A
K	(4) #250 & (1) #4 GRD - 3"C	205A
L	(4) #300 & (1) #2 GRD - 4"C	230A
M	(4) #350 & (1) #2 GRD - 4"C	250A
N	(4) #400 & (1) #2 GRD - 4"C	270A
O	(4) #500 & (1) #2 GRD - 4"C	310A
P	(4) #600 & (1) #1 GRD - 4"C	340A
Q	2 SETS (4) #4/0 & (1) #1 GRD - 3"C	360A
R	2 SETS (4) #250 & (1) #1 GRD - 3"C	410A
S	2 SETS (4) #300 & (1) #1/0 GRD - 4"C	460A
T	2 SETS (4) #350 & (1) #1/0 GRD - 4"C	500A
U	2 SETS (4) #400 & (1) #2/0 GRD - 4"C	540A
V	2 SETS (4) #500 & (1) #2/0 GRD - 4"C	620A
W	2 SETS (4) #600 & (1) #3/0 GRD - 4"C	680A
X	3 SETS (4) #300 & (1) #3/0 GRD - 4"C	690A
Y	3 SETS (4) #350 & (1) #3/0 GRD - 4"C	750A
Z	3 SETS (4) #400 & (1) #3/0 GRD - 4"C	810A
AA	3 SETS (4) #500 & (1) #4/0 GRD - 4"C	930A
A3	3 SETS (4) #600 & (1) #250 GRD - 4"C	1020A
BB	4 SETS (4) #500 & (1) #250 GRD - 4"C	1240A
CC	4 SETS (4) #600 & (1) #350 GRD - 4"C	1360A
DD	4 SETS (4) #750 & (1) #600 GRD - 4"C	1540A
EE	5 SETS (4) #600 & (1) #350 GRD - 4"C	1700A
FF	6 SETS (4) #500 & (1) #400 GRD - 4"C	1860A
GG	6 SETS (4) #600 & (1) #400 GRD - 4"C	2040A
HH	6 SETS (4) #750 & (1) #600 GRD - 4"C	2310A
CU	COPPER FEEDER	
VD	INCREASED FEEDER SIZE DUE TO VOLTAGE DROP	
2HR	DRAKE LIFELINE RHW-2 IN XW BREATHSAVER PHENOLIC CONDUIT	
CE	FEEDER ENCASED MIN. 2" CONCRETE	
US	CONDUIT RUN OUTSIDE OF BUILDING UNDER SLAB	

FEEDER SCHEDULE
3Ø, 4W (COPPER, U.O.N.)

TAG	FEEDER SIZES	RATING
A	(4) #8 & (1) #10 GRD - 1"C	50A
B	(4) #4 & (1) #8 GRD - 1 1/4"C	85A
C	(4) #3 & (1) #8 GRD - 1 1/2"C	100A
D	(4) #2 & (1) #6 GRD - 1 1/2"C	115A
E	(4) #1 & (1) #6 GRD - 2"C	130A
F	(4) #1/0 & (1) #6 GRD - 2"C	150A
G	(4) #2/0 & (1) #6 GRD - 2 1/2"C	175A
H	(4) #3/0 & (1) #6 GRD - 2 1/2"C	200A
I	(4) #4/0 & (1) #4 GRD - 2 1/2"C	230A
J	(4) #250 & (1) #4 GRD - 3"C	255A
K	(4) #300 & (1) #4 GRD - 3"C	285A
L	(4) #350 & (1) #4 GRD - 4"C	310A
M	(4) #400 & (1) #3 GRD - 4"C	335A
N	(4) #500 & (1) #3 GRD - 4"C	380A
O	(4) #600 & (1) #3 GRD - 4"C	420A
P	2 SETS (4) #4/0 & (1) #3 GRD - 3"C	460A
Q	2 SETS (4) #250 & (1) #2 GRD - 3"C	510A
R	2 SETS (4) #300 & (1) #2 GRD - 4"C	570A
S	2 SETS (4) #350 & (1) #1 GRD - 4"C	620A
T	2 SETS (4) #400 & (1) #1 GRD - 4"C	670A
U	2 SETS (4) #500 & (1) #1/0 GRD - 4"C	760A
V	2 SETS (4) #600 & (1) #1/0 GRD - 4"C	840A
W	3 SETS (4) #300 & (1) #1/0 GRD - 4"C	855A
X	3 SETS (4) #350 & (1) #1/0 GRD - 4"C	930A
Y	3 SETS (4) #400 & (1) #2/0 GRD - 4"C	1005A
Z	3 SETS (4) #500 & (1) #2/0 GRD - 4"C	1140A
AA	3 SETS (4) #600 & (1) #3/0 GRD - 4"C	1260A
BB	4 SETS (4) #400 & (1) #3/0 GRD - 4"C	1340A
CC	4 SETS (4) #500 & (1) #3/0 GRD - 4"C	1520A
DD	4 SETS (4) #600 & (1) #4/0 GRD - 4"C	1680A
EE	5 SETS (4) #500 & (1) #4/0 GRD - 4"C	1900A
FF	5 SETS (4) #600 & (1) #250 GRD - 4"C	2100A
GG	6 SETS (4) #600 & (1) #350 GRD - 4"C	2520A
HH	8 SETS (4) #500 & (1) #400 GRD - 4"C	3040A
AL	ALUMINUM FEEDER, REFER TO ALUMINUM FEEDER SCHEDULE	
VD	INCREASED FEEDER SIZE DUE TO VOLTAGE DROP	
2HR	DRAKA LIFELINE RHW-2 IN XW BREATHSAVER PHENOLIC CONDUIT	
CE	FEEDER ENCASED MIN. 2" CONCRETE	
US	CONDUIT RUN OUTSIDE OF BUILDING UNDER SLAB	

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ELECTRICAL POWER RISER NOTES & FEEDER SCHEDULE

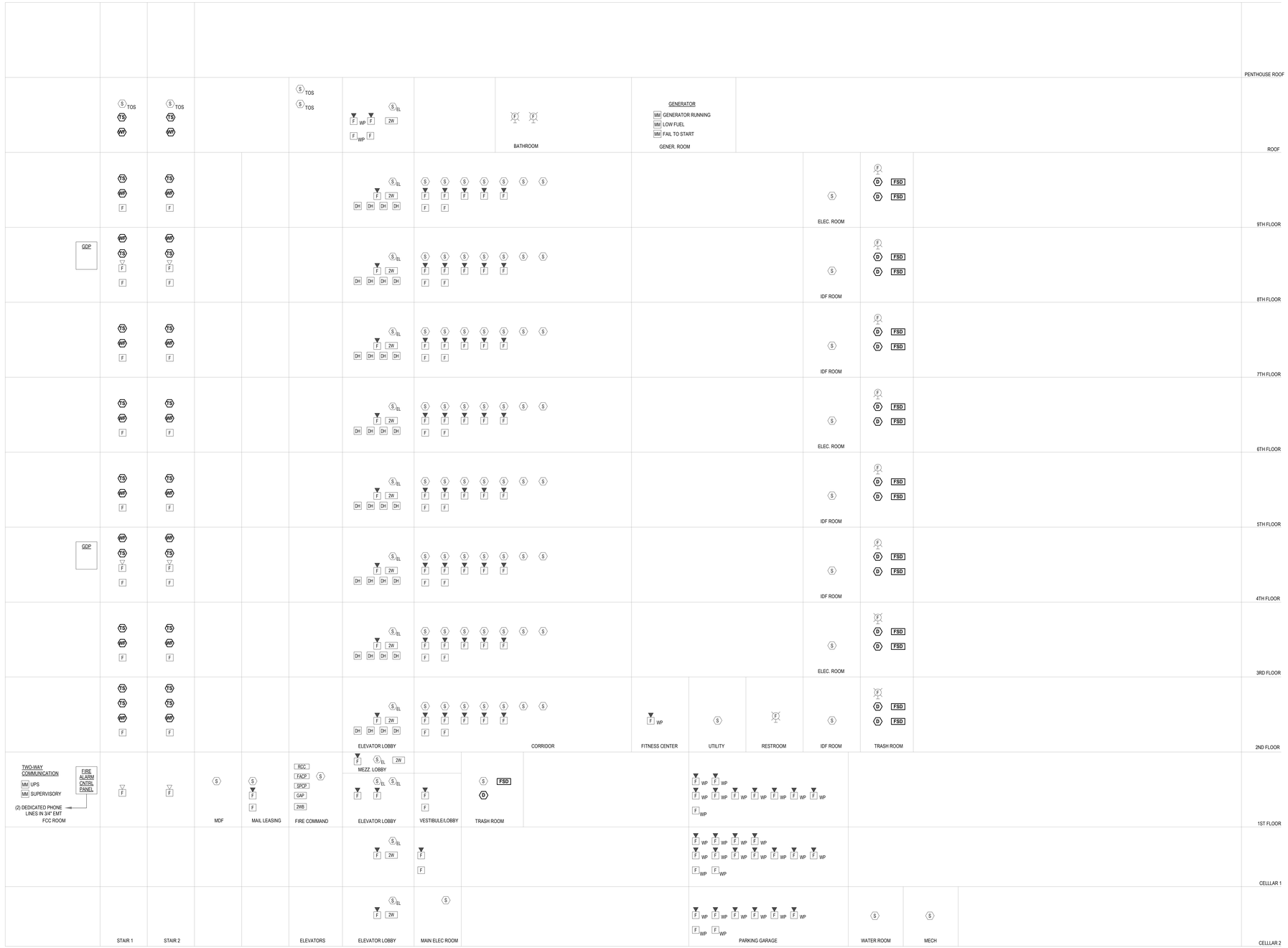
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FIRE ALARM GENERAL NOTES:

1. PROVIDE ALL EQUIPMENT, PROGRAMMING & WIRING REQUIRED FOR A COMPLETE CODE COMPLIANT SYSTEM.
2. PROVIDE ALL FILING, PERMIT & FIRE DEPARTMENT INSPECTION FEES.
3. ALL NOTIFICATION AND SIGNAL LINE CIRCUITS SHALL BE CLASS B WIRING WITHOUT T-TAPPING OF CIRCUITS.
4. PROVIDE PRIMARY & SECONDARY PHONE LINES FOR CENTRAL OFFICE CONNECTION. CENTRAL OFFICE TELEPHONE WIRING SHALL BE INSTALLED IN 1" RGS CONDUIT.
5. ALL 120V CIRCUITS FOR THE FIRE ALARM SYSTEM SHALL BE DEDICATED EMERGENCY CIRCUITS. PROVIDE LOCKABLE CIRCUIT BREAKERS FOR ALL FIRE ALARM CIRCUITS.
6. COORDINATE WITH THE LOCAL AUTHORITY HAVING JURISDICTION FOR THE EXACT SEQUENCE OF OPERATIONS.
7. SMOKE DETECTORS SHALL BE A MINIMUM OF 3 FEET FROM ALL SUPPLY DIFFUSERS.
8. PROVIDE STYLE 7 WIRING FOR ALL NETWORK WIRING BETWEEN DGP'S AND MAIN FIRE CONTROL PANEL. RETURN CIRCUIT SHALL BE IN A SEPARATE CONDUIT.
9. ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT WHEN RUN EXPOSED IN MECHANICAL ROOMS. PROVIDE CONDUIT CONCEALED IN WALLS UP TO ACCESSIBLE CEILING WITH INSULATING BUSHING FOR ALL WALL MOUNTED FIRE ALARM DEVICES.
10. PROVIDE A MINIMUM OF TWO ALTERNATELY CIRCUITED HORN/STROBE CIRCUITS PER FLOOR. MAINTAIN A MINIMUM OF 25% SPARE CAPACITY ON ALL ADDRESSABLE LOOPS AND ALL HORN AND STROBE CIRCUITS.
11. STROBE LIGHTS SHALL BE ARRANGED FOR SYNCHRONIZED OPERATION ON A PER FLOOR BASIS.
12. ALL FIRE ALARM EQUIPMENT SHALL BE APPROVED BY LOCAL AHJ PRIOR TO ORDERING.
13. FIRE ALARM RISER IS A DIAGRAMMATIC REPRESENTATION OF THE SYSTEM. REFER TO FLOOR PLANS FOR DEVICE LOCATION AND QUANTITIES.
14. ALL FIRE ALARM CABLING SHALL BE PLENUM RATED.
15. ALL FIRE ALARM ANNUNCIATING DEVICES SHALL BE "WHITE".
16. ALL ELECTRONICALLY SECURED DOORS SHALL BE TIED TO THE BUILDING'S FIRE ALARM SYSTEM SUCH THAT IN THE EVENT THAT THE FIRE ALARM SYSTEM IS ACTIVATED, THESE DOORS FAILSAFE OPEN.
17. PROVIDE A 20A, 120V CIRCUIT FROM NEAREST CORRIDOR RECEPTACLE TO ALL DOORS WITH MAGNETIC HOLD OPENS.
18. PROVIDE AN AUXILARY RADIO COMMUNICATION (ARC) SYSTEM. PROVIDE ALL TRANSCEIVERS, ANTENNAS, RADIO CONSOLES, AMPLIFIERS, ETC. AS REQUIRED. PROVIDE EMERGENCY CIRCUITS AS REQUIRED. COORDINATE WITH FIRE ALARM VENDOR FOR EXACT REQUIREMENTS.
19. PROVIDE A CONTROL MODULE AND RELAY FOR ALL FIRE SMOKE DAMPERS. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION AND QUANTITIES. PROVIDE DUCT SMOKE DETECTORS TO ACTIVATE FIRE SMOKE DAMPERS AS REQUIRED. PROVIDE A REMOTE TEST STATION WITH LED INDICATORS IN NEAREST ELECTRICAL/MECHANICAL CLOSET FOR EACH DUCT SMOKE DETECTOR.
20. PROVIDE (3) FIRE ALARM MONITOR MODULES FOR EACH HEAT TRACE CONTROLLER SERVING SPRINKLER PIPES. PROVIDE (4) MONITOR MODULES FOR EACH DRY PIPE COMPRESSOR.
21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS THAT INCLUDE MANUFACTURER'S CUT SHEETS THAT INCLUDE EQUIPMENT MODEL NUMBERS, BATTERY CALCULATIONS, CONDUCTOR TYPE AND SIZES, AND VOLTAGE DROP CALCULATIONS.
22. PROVIDE A STAIR PRESSURIZATION CONTROL PANEL WITH FAN STATUS AND CONTROL SWITCHES. PROVIDE ALL AIR FLOW SWITCHES AND CURRENT MONITORING DEVICES REQUIRED FOR POSITIVE CONFIRMATION FOR ALL REQUIRED STATUS CONDITIONS.
23. ALL CONTROL WIRING FOR STAIR PRESSURIZATION AND SMOKE PURGE CONTROL SHALL BE RUN IN EMT CONDUIT.
24. THE FIRE ALARM INSTALLER AND VENDOR MUST BE LICENSED FOR FIRE ALARM INSTALL WITH THE NY DEPARTMENT OF STATE.
25. PROVIDE SEPARATE HOA SWITCH CONTROLLED PANEL FOR ALL GARAGE FANS IN THE FIRE COMMAND CENTER.
26. PROVIDE TEMPERATURE SENSORS IN FIRE SERVICE ACCESS ELEVATOR LOBBIES AND IN THE ELEVATOR MACHINE ROOM AND AN ASSOCIATED FIRE ALARM ANNUNCIATOR PANEL IN THE FIRE ALARM COMMAND CENTER.

FIRE ALARM RISER DIAGRAM

FIRE ALARM SEQUENCE OF OPERATION

1. ACTIVATION OF A MANUAL PULL STATION SHALL:
   a. ANNUNCIATE AT THE MAIN FIRE ALARM CONTROL PANEL AND AT THE REMOTE ANNUNCIATORS.
   b. SEND ALARM INDICATION TO CENTRAL STATION COMPANY TO NOTIFY THE FIRE DEPARTMENT.
   c. ACTIVATE ALARM TONES ON ALL FLOORS.
2. ACTIVATION OF A SMOKE DETECTOR, HEAT DETECTOR, DUCT SMOKE DETECTOR, WATER FLOW SWITCH, IN COMMON AREAS SHALL PERFORM FUNCTIONS LISTED IN a, b & c ABOVE AND:
   d. SHUTDOWN ALL FAN SYSTEMS
   e. CLOSE ALL SMOKE DAMPERS
   f. CLOSE ALL SMOKE CONTROL DOORS IN ALL BUILDINGS
3. ACTIVATION OF AN ELEVATOR LOBBY, ELEVATOR MACHINE ROOM AND HOIST WAY SMOKE DETECTOR SHALL PERFORM FUNCTIONS LISTED IN a, b, c, d, e, AND f ABOVE AND:
   h. RECALL ALL ELEVATORS TO THE GROUND FLOOR (PROVIDE ALTERNATE RECALL AS PER NFPA) AND OPEN ASSOCIATED HOIST WAY VENT.
4. ACTIVATION OF A TOP OR BOTTOM SHAFT HEAT DETECTOR SHALL ACTIVATE ELEVATOR SHUNT TRIP BREAKER TO DISCONNECT POWER FROM ELEVATOR CAB(S) OF THAT SHAFT.
5. ACTIVATION OF SPRINKLER TAMPER SWITCH SHALL ACTIVATE A SUPERVISORY SIGNAL AT THE THE FIRE CONTROL PANEL.

FIRE ALARM - DWELLING UNIT SINGLE STATION 120 VAC SMOKE ALARM AND CARBON MONOXIDE

DWELLING UNIT SINGLE STATION 120 VAC SMOKE ALARM AND CARBON MONOXIDE ALARM DEVICE REQUIREMENTS:
(COORDINATE LOCATION OF DWELLING UNIT DETECTION DEVICES WITH ARCHITECT)

1. ALL SMOKE ALARMS SHALL BE PHOTOELECTRIC TYPE.
2. ALL SMOKE AND CARBON MONOXIDE ALARMS SHALL PRODUCE AN ALARM SIGNAL WITH A MINIMUM 85dBA AT 10FEET.
3. SMOKE ALARMS AND CARBON MONOXIDE ALARMS SHALL BE POWERED BY AN UNSWITCHED 120 VAC BRANCH CIRCUIT. ANNUNCIATION SHALL BE LOCAL ONLY.
4. IN DWELLING UNITS WHERE THERE ARE MULTIPLE DETECTORS, DETECTORS SHALL BE CONNECTED IN TANDEM SO THAT ALL SOUNDER BASES OF THE SAME DETECTOR TYPE, WITHIN THE SAME DWELLING UNIT, SHALL SOUND UPON ACTIVATION OF ANY SIMILAR DETECTOR.
5. ALL DEVICES SHALL BE PROVIDED WITH BATTERY BACK-UP.
6. SMOKE AND CO ALARMS SHALL BE LOCATED IN EACH SLEEPING ROOM AND OUTSIDE EACH SLEEPING ROOM WITHIN 5 FEET OF THE ENTRANCE.
7. SMOKE ALARMS AND CARBON MONOXIDE ALARMS SHALL BE PROVIDED WITH DRY CONTACTS TO BE CONNECTED TO ADDRESSABLE MODULES SO THAT HORN DEVICES ARE ACTIVATED UPON ACTIVATION OF AN ALARM. PROVIDE ADDRESSABLE CONTROL AND MONITOR MODULES AS REQUIRED.

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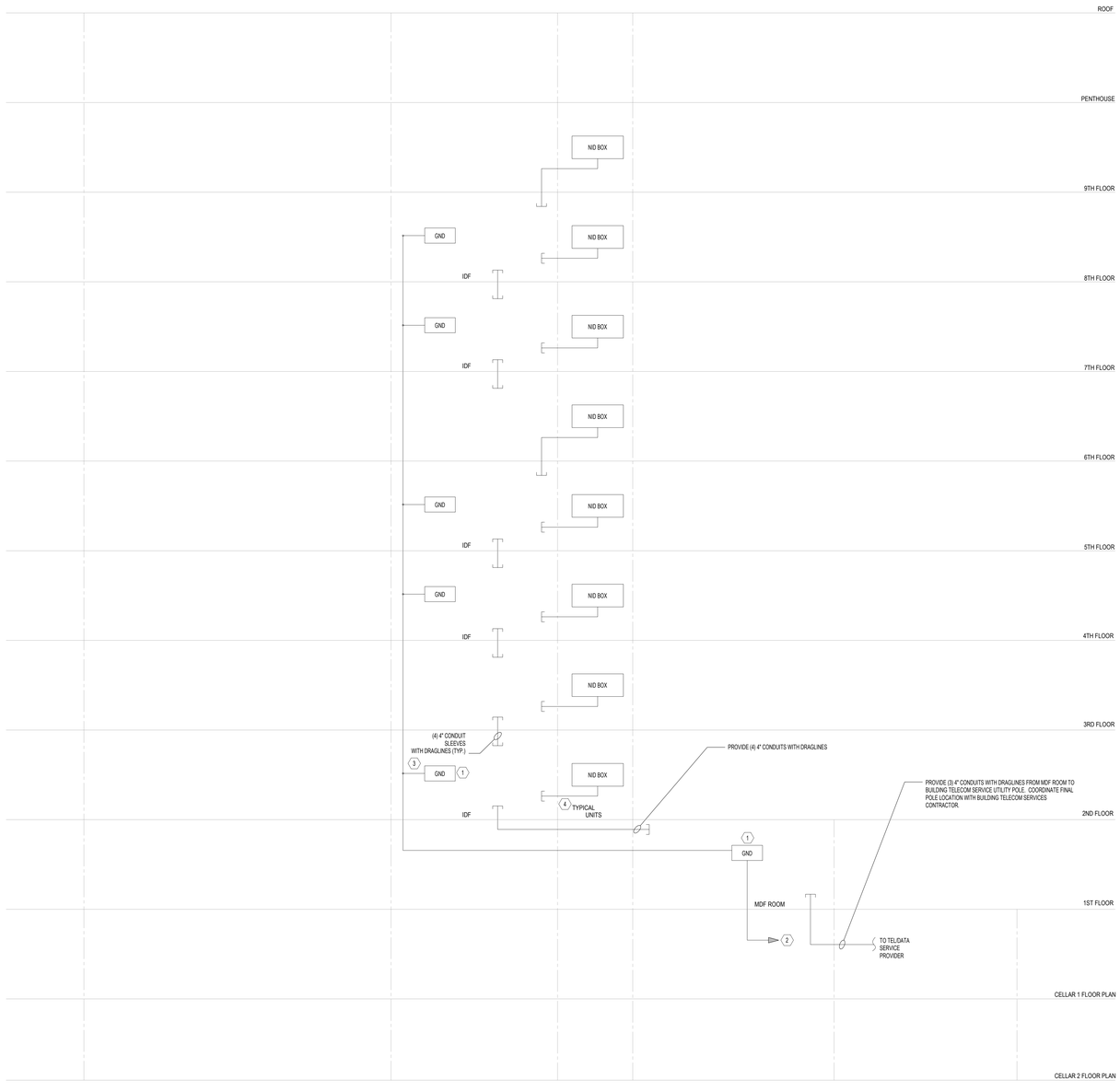
ELECTRICAL FIRE ALARM RISER DIAGRAM

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ELECTRICAL KEY NOTES:

1. ELECTRICAL CONTRACTOR SHALL PROVIDE A GROUND COPPER BUS BAR IN EACH MDF AND IDF ROOMS. (TYPICAL)
2. ELECTRICAL CONTRACTOR SHALL PROVIDE 1#3/0 CU. INSULATED GROUND WIRE FROM MDF COPPER BUS BAR TO MAIN ELECTRICAL SERVICE GROUND BUS BAR.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE 1#3/0 CU. INSULATED GROUND WIRE FROM MDF COPPER BUS BAR TO EACH IDF COPPER BUS BAR. (TYPICAL)
4. ELECTRICAL CONTRACTOR SHALL PROVIDE (1) 1 1/2" EMPTY CONDUIT WITH (3) DRAGLINES FROM IDF ROOM TO EACH APARTMENT UNIT NID BOX. (TYPICAL)

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PORTCHESTER, NY

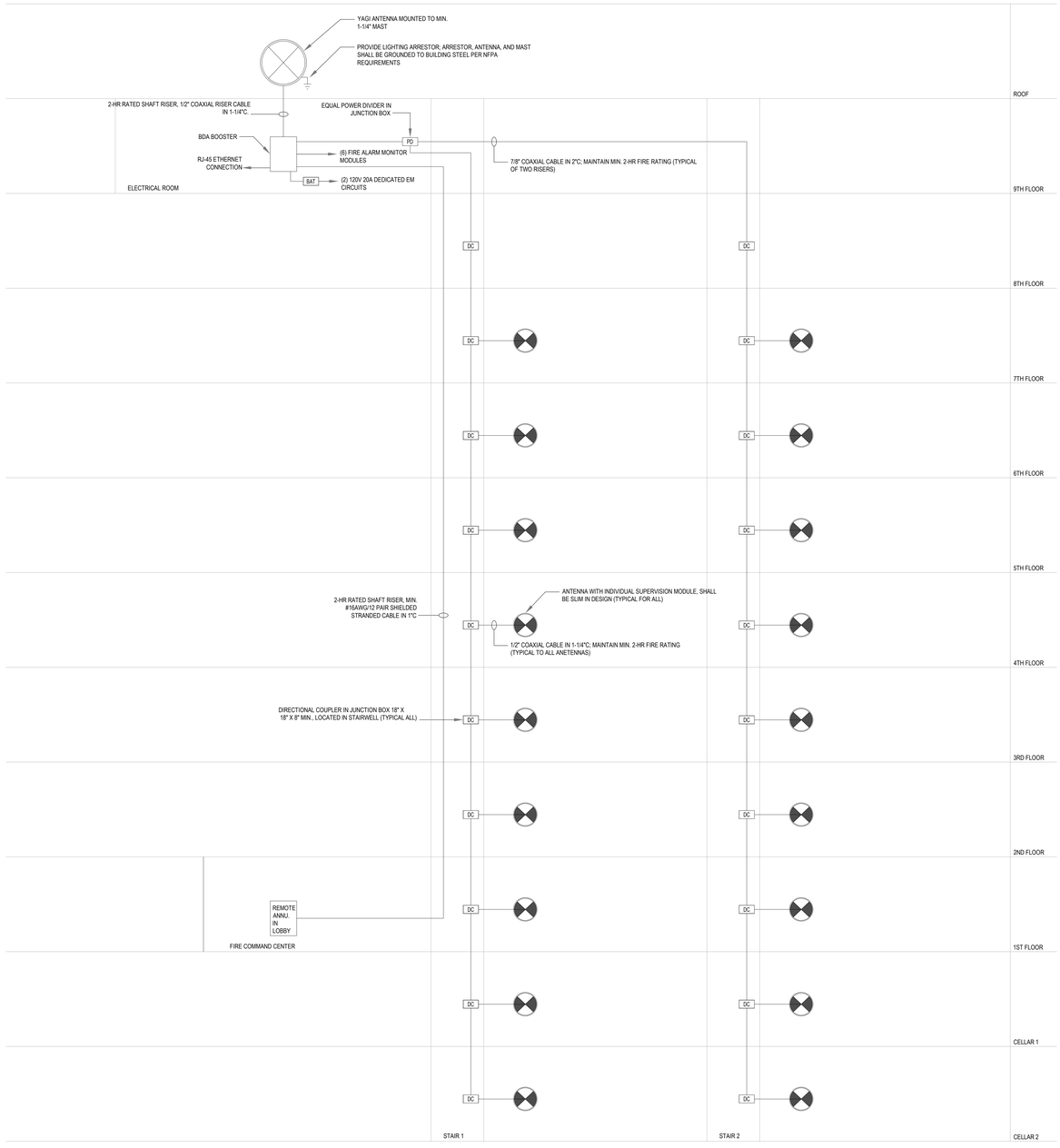
ELECTRICAL TELECOM RISER DIAGRAM

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
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E-505

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ELECTRICAL FIRE DEPARTMENT RADIO ENHANCEMENT SYSTEM

GENERAL NOTE:

1. INITIAL SCOPE SHALL INCLUDE ALL BOXES AND RACEWAYS FOR FUTURE EQUIPMENT AND CABLING IN THE EVENT THAT THE FIRE DEPARTMENT REQUIRES AN EMERGENCY RESPONDER RADIO COVERAGE SYSTEM TO MEET THEIR MINIMUM RADIO STRENGTH FOR COMMUNICATION. VERIFY EXACT REQUIREMENTS WITH THE FIRE DEPARTMENT.

EMERGENCY RESPONDER RADIO COVERAGE

ELECTRICAL CONTRACTOR SHALL SUB-CONTRACT AN AUTHORIZED BI-DIRECTIONAL AMPLIFIER (BDA) CONTRACTOR TO SURVEY, DESIGN, FURNISH, AND INSTALL A COMPLETE AND FUNCTIONING CODE COMPLIANT BDA SYSTEM IN ACCORDANCE WITH THE 2018 INTERNATIONAL FIRE CODE AS ADOPTED BY THE 2020 NEW YORK STATE BUILDING CODE, 2016 NFPA 1221, AND THAT MEETS ALL LOCAL AHJ, FIRE DEPARTMENT, AND MUNICIPALITY REQUIREMENTS.

NOTES & SEQUENCE:

1. BDA RISER IS DIAGRAMMATIC AND COMPLETE SHOP DRAWINGS SHALL BE PRODUCED PRIOR TO INSTALLING RACEWAY AND BOXES. AT MINIMUM, THE ELECTRICAL CONTRACTOR SHALL PROVIDE (1) 2" EMPTY CONDUITS WITH DRAGLINES IN EACH STAIRWELL ON ALL FLOORS FOR FUTURE RADIO SYSTEMS.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL RACEWAY IN SLAB, AS INDICATED DURING DURING CONSTRUCTION OF BUILDING STRUCTURE.
3. BDA VENDOR SHALL REQUEST DOCUMENTATION FROM THE AHJ AND/OR FIRE MARSHAL AS TO ALL THE REQUIRED PUBLIC EMERGENCY RESPONSE FREQUENCIES, BOTH DAY 1 AND FUTURE. THE BDA SYSTEM SHALL HAVE THE CAPABILITIES TO MODIFY AND ADD FREQUENCIES TO BE ADAPTABLE TO FUTURE MUNICIPALITY CHANGES.
4. AFTER COMPLETION OF BUILDING STRUCTURE AND ENVELOPE, BDA CONTRACTOR/VENDOR SHALL SURVEY TO ASSESS RADIO COVERAGE AVAILABLE IN ALL AREAS OF THE BUILDING AND TO DETERMINE THE EXACT REQUIREMENTS OF THE BDA INSTALLATION, REQUIRED EQUIPMENT, CABLE ROUTING, ANTENNA LOCATIONS/QUANTITIES, ETC.
5. BDA CONTRACTOR/VENDOR SHALL PROVIDE ALL EQUIPMENT, ANTENNAS, COUPLERS, POWER SUPPLIES, POWER DIVIDERS, AND CABLING AS REQUIRED FOR A COMPLETE, FUNCTIONING, AND CODE COMPLIANT INSTALLATION.
6. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL RACEWAYS, BACK BOXES, GROUND & BOND CONNECTIONS, AND CIRCUITS REQUIRED FOR A COMPLETE, FUNCTIONING, AND CODE COMPLIANT INSTALLATION.
7. ALL CABLING SHALL HAVE A FIRE RESISTANCE RATING OF 2-HR OR SHALL BE ROUTED IN A 2-HR RATED ASSEMBLY.
8. ALL CABLING SHALL BE PLENUM RATED.
9. ALL POWER SPLITTERS SHALL BE LOCATED WITHIN THE 2-HR STAIRWELL ENCLOSURE FOR ACCESSIBILITY. WHERE SPLITTERS CANNOT BE LOCATED IN AN ACCESSIBLE AREA ACCESS PANELS SHALL BE PROVIDED AND COORDINATED WITH THE GENERAL CONTRACTOR AND ARCHITECT.
10. BDA CONTRACTOR SHALL BE RESPONSIBLE FOR ACTIVELY COORDINATING BETWEEN OTHER TRADES DURING INSTALLATION; ELECTRICAL, FIRE ALARM, TELECOM & SECURITY, AND THE GC/CM.
11. WHERE ANY RISER AND/OR BRANCH CABLING IS EXPOSED TO THE GENERAL PUBLIC, IT MUST BE MECHANICALLY PROTECTED FROM ACCIDENTAL AND INTENTIONAL PHYSICAL DAMAGE.
12. BDA SYSTEM SHALL BE PROPERLY MONITORED BY THE FIRE ALARM SYSTEM.
13. CABINETS FOR EQUIPMENT AND BATTERY BACKUP SHALL NEMA 4X.

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FIRE ALARM ERRCS RISER DIAGRAM

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25

PROJECT No: B2R24080
DRAWN BY: MV/MD
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Branch... AP-A1

Location: UNIT A1 323
Supply From:
Mounting: Recessed
Enclosure: Type 1

Volts: 208V/120V
Phases: 1
Wires: 3

A.I.C.... 22K
Mains Type: MLO
Mains... 125 A
MCB Rating: 0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		Poles	Trip	Circuit Description	CKT
1	LIGHTING (A)	20 A	1	50 VA	360 VA			1	20 A	KITCHEN RECEPTACLES (A/G)	2
3	RANGE	50 A	2			4000 VA	360 VA	1	20 A	KITCHEN RECEPTACLES (A/G)	4
5	3#8 + 1#10 GRD IN 1"C			4000 VA	180 VA			1	20 A	REFRIGERATOR (A/G)	6
7	MICROWAVE (A/G)	20 A	1			180 VA	900 VA	1	20 A	BEDROOM RECEPTACLES (A)	8
9	DISHWASHER (A/G)	20 A	1	180 VA	720 VA			1	20 A	LIVING ROOM RECEPTACLES (A)	10
11	NID RECEPTACLE (A)	20 A	1			360 VA	180 VA	1	20 A	WASHER (A/G)	12
13	GENERAL RECEPTACLES (A)	20 A	1	720 VA	2500 VA			2	30 A	DRYER (G) 3#10 + 1#10 GRD - 3/4"C	14
15	BATHROOM GFI RECPTACLE	20 A	1			180 VA	2500 VA				16
17	BATHROOM GFI RECPTACLE	20 A	1	180 VA	10 VA			1	20 A	SMOKE ALARM (A)	18
19	WATER HEATER 2#8 + 1#10 GRD - 3/4"C	40 A	2			3000 VA	2500 VA	2	30 A	AHU-R-1 2#10 + 1#10 GRD - 3/4"C	20
21				3000 VA	2500 VA						22
23	MOTORIZED DAMPER	20 A	1			50 VA	0 VA	2	30 A	ACCU 2#10 + 1#10 GRD - 3/4"C	24
25					0 VA						26
27											28
29											30
			Total Load:	14400 VA		14210 VA					
			Total Amps:	138 A		137 A					

Legend:

A = AFCI TYPE CIRCUIT BREAKER; G = GFCI TYPE CIRCUIT BREAKER; A/G = AFCI/GFCI TYPE CIRCUIT BREAKER

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Other	10 VA	100.00%	10 VA		
Receptacle	17500 VA	78.57%	13750 VA	**Total Conn. Load:**	28610 VA
Power	11100 VA	100.00%	11100 VA	**Total Est. Demand:**	24860 VA
				Total Conn.:	138 A
				Total Est. Demand:	120 A

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ELECTRICAL PANEL SCHEDULES

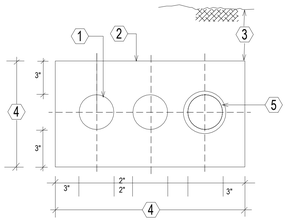
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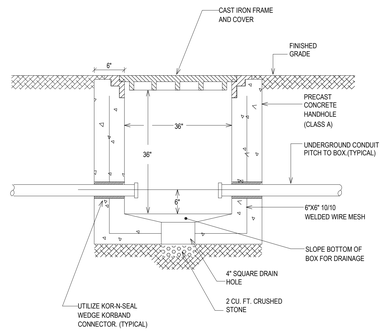


CONDUIT BANK CONCRETE ENCASED DETAIL

N.T.S.

NOTES:

1. RIGID GALVANIZED STEEL CONDUIT
2. POURED IN PLACE CONCRETE
3. 24" MINIMUM BELOW GRADE IN ACCORDANCE WITH NEC ARTICLE 300.5
4. SIZE AND OVERALL DIMENSION TO SUIT REQUIREMENTS
5. STAGGERED CONDUIT COUPLINGS

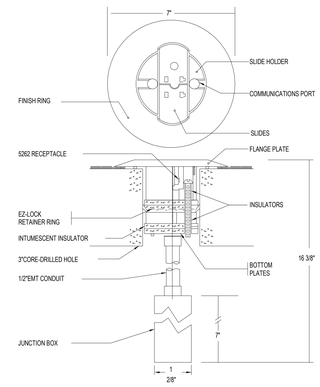


UNDERGROUND HANDHOLD DETAIL

N.T.S.

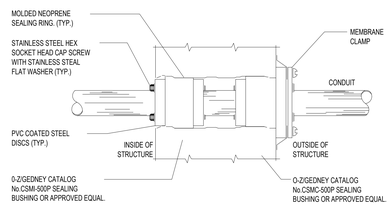
NOTES:

1. HANDHOLE DEPTH SHALL BE 36" CLEAR.
2. HANDHOLES PROVIDED AS REQUIRED, PER NEC.



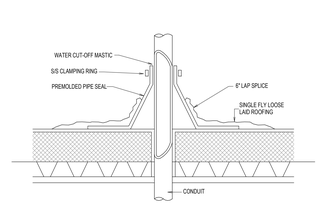
POWER/COMMUNICATION POKE-THRU FLUSH FLOOR MOUNTED

N.T.S.



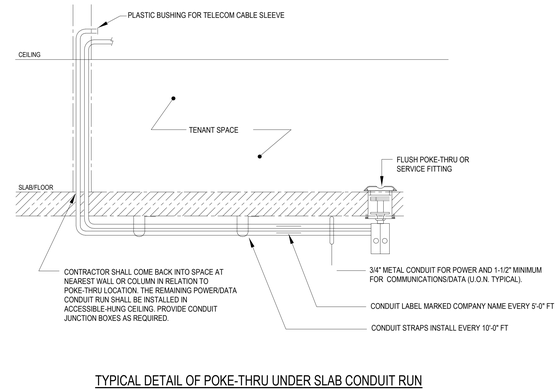
EXTERIOR WALL PENETRATION DETAIL

N.T.S.



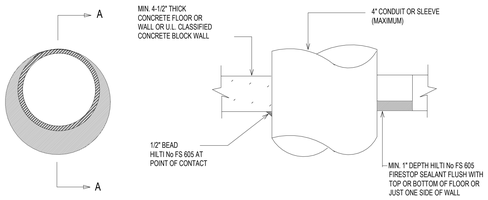
CONDUIT ROOF PENETRATION DETAIL

N.T.S.



TYPICAL DETAIL OF POKE-THRU UNDER SLAB CONDUIT RUN

N.T.S.

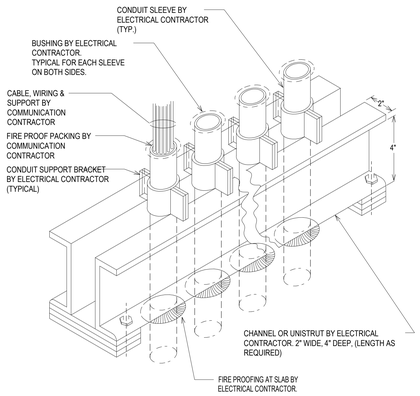


DETAIL OF CONDUIT THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

N.T.S.

NOTES:

1. CONDUIT MAY BE CENTERED OR OFFSET IN HOLE. MAXIMUM DIAMETER OF HOLE OPENING IS 14 INCHES.
2. TEMPORARY FORMS MAY BE REQUIRED TO SUPPORT THE FIRESTOP SEALANT WHILE IT CURES.
3. FOR CONDUIT SLEEVE INSTALATIONS PROVIDE AROUND CONDUCTORS WITHIN SLEEVE.

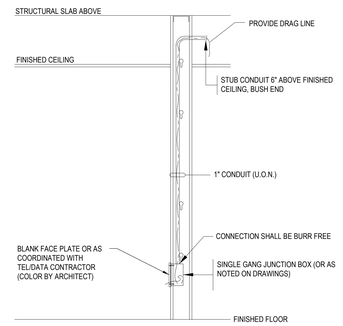


COMMUNICATION CONDUIT VERTICAL SUPPORT DETAIL

N.T.S.

NOTES:

1. ELECTRICAL CONTRACTOR SHALL SUBMIT SHOP DRAWING OF CONDUIT SUPPORT FOR REVIEW BY STRUCTURAL ENGINEER.
2. CONDUIT SUPPORT SHALL BE PROVIDED IN QUANTITIES AS REQUIRED TO ACCOMMODATE ALL VERTICAL COMMUNICATION CONDUITS.



NOTE: ALL DATA AND TEL. CABLING IS BY OTHERS

COMMUNICATION RECEPTACLE DETAIL (TYPICAL)

N.T.S.

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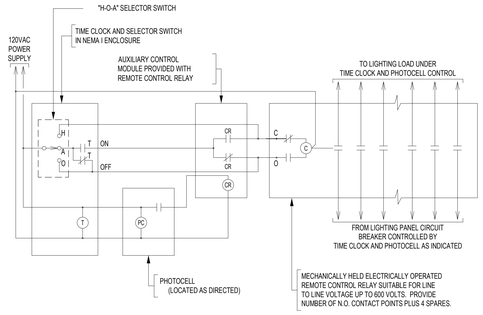
ELECTRICAL DETAILS (1 OF 3)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
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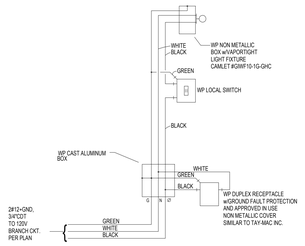


OUTDOOR LIGHTING CONTROL WIRING DIAGRAM WITH TIME CLOCK AND PHOTOCELL

N.T.S.

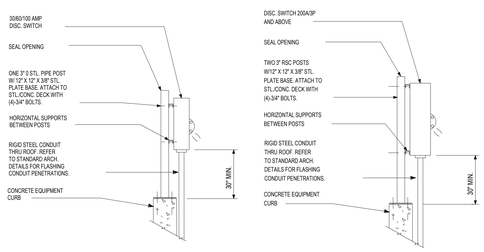
NOTES:

1. MECHANICALLY HELD AND ELECTRICALLY OPERATED REMOTE CONTROL MULTIPOLE RELAY SHALL BE ASCO-917 SERIES WITH AUXILIARY CONTROL MODULE OR APPROVED EQUAL IN NEMA I ENCLOSURE.
2. TIME CLOCK SHALL BE TORK #DG120 WITH MAINTAINED DPDT DRY CONTACTS OR APPROVED EQUAL. CONTRACTOR SHALL SET TIME CLOCK PER OWNER'S REQUIREMENT.



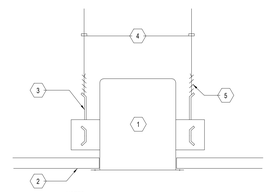
ROOF TOP MAINTENENCE UNIT LTG/PWR DETAIL

N.T.S.



ROOF MOUNTED DISCONNECT SWITCH DETAIL

N.T.S.

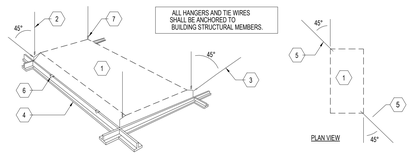


NOTES:

1. RECESSED DOWNLIGHT FIXTURE
2. GYPSUM BOARD OR TILE CEILING
3. FIXTURE MOUNTING BRACKET
4. #12 AWG HANGER WIRE CONNECTED TO BUILDING STRUCTURAL MEMBER
5. MINIMUM 4 TURNS WITHIN 1-1/2" OF FIXTURE (TYPICAL)

RECESSED DOWNLIGHT SEISMIC BRACING

N.T.S.

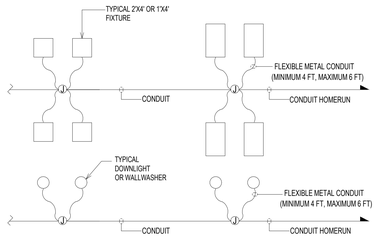


NOTES:

1. RECESSED FLUORESCENT LIGHT FIXTURE
2. #12 AWG HANGER WIRE (VERTICAL AT FOUR CORNERS)
3. #12 AWG TIE WIRE (45° DIAGONAL AT OPPOSITE CORNERS)
4. T-BAR GRID (TYPICAL)
5. TIE WIRE
6. CADDY T-BAR CLIP FOR SECURING FIXTURE TO T-BAR GRID (4/FIXT.)
7. MINIMUM 4 TURNS WITHIN FIRST 1-1/2" (VERTICAL)

RECESSED LAY-IN FIXTURE SEISMIC BRACING

N.T.S.

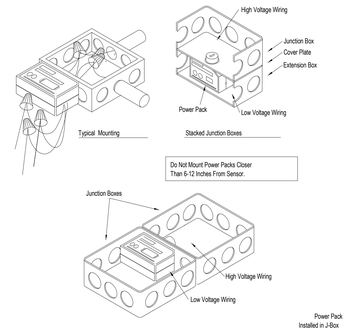


TYPICAL LIGHTING FIXTURE CIRCUITING DETAIL

N.T.S.

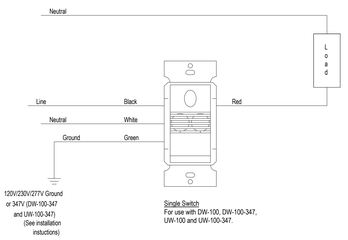
NOTE:

1. LIGHTING FIXTURES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH FIXTURE ON THE LIGHTING DRAWINGS.
2. ARMORED CABLE MAYBE PROPOSED AS AN ALTERNATE TO CONDUIT. REFER TO SPECIFICATION.



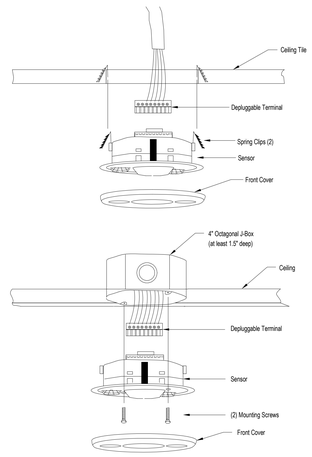
POWER PACK INSTALLATION DETAIL

N.T.S.



WALL MTD. OCCUPANCY SENSOR WIRING DIAGRAM

N.T.S.



MOUNTING DETAIL FOR CEILING MTD. OCCUPANCY SENSOR

N.T.S.

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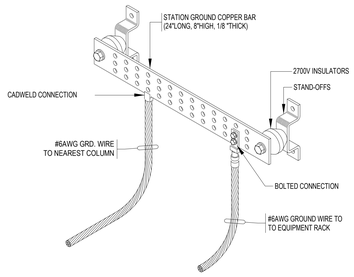
ELECTRICAL DETAILS (2 OF 3)

NO.	DESCRIPTION	DATE
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PLOT DATE: 2/7/2025 12:24:35 PM
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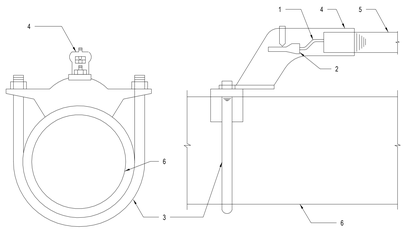
E-702

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EQUIPMENT GROUNDING BAR ASSEMBLY

N.T.S.

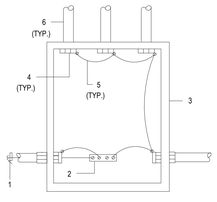


NOTES:

1 GROUNDING ELECTRODE CONDUCTOR
2 CONDUCTOR TERMINAL
3 GROUND CLAMP ASSEMBLY
4 THREADED GROUND HUB OR GROUNDING BUSHING
5 CONDUIT
6 WATER SERVICE PIPE

MAIN WATER PIPE ELECTRODE CONNECTION

N.T.S.



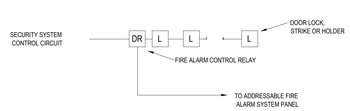
RACEWAY EQUIPMENT GROUNDING SYSTEM

N.T.S.

NOTES:

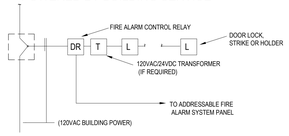
1 SYSTEM EQUIPMENT GROUNDING CONDUCTOR SIZED AS PER NEC TABLE 250.122
2 PANELBOARD EQUIPMENT GROUND BUS
3 SERVICE ENTRANCE EQUIPMENT SWITCHBOARD/ PANELBOARD ENCLOSURE.
4 GROUNDING BUSHING
5 BONDING JUMPER INSTALLED AS PER NEC ARTICLE 250
6 METAL CONDUIT, TYPICAL

POWERED BY SECURITY SYSTEM



UPON ALARM CONDITION, FIRE ALARM RELAY SHALL BREAK SECURITY SYSTEM CONTROL/POWER CIRCUIT AND CAUSE ELECTRIC STRIKES TO RELEASE FAIL-SAFE

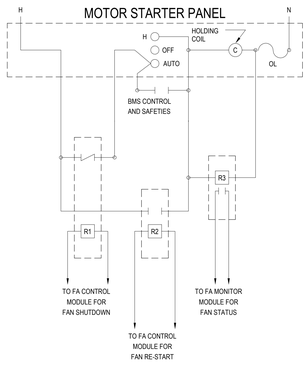
POWERED BY BUILDING SERVICE



UPON ALARM CONDITION, FIRE ALARM SYSTEM SHALL DE-ENERGIZE THE ADDRESSABLE FIRE ALARM RELAY AND THUS BREAK PRIMARY POWER TO DOOR HOLDER/STRIKE, EITHER DIRECTLY OR VIA TRANSFORMER CAUSING DOOR HOLDERS TO RELEASE FAIL-SAFE.
UTILIZING SECURITY SYSTEM CONTROL TO RELEASE DOORS IS NOT ACCEPTABLE.

FIRE ALARM DOOR SECURITY FAIL-SAFE DIAGRAM

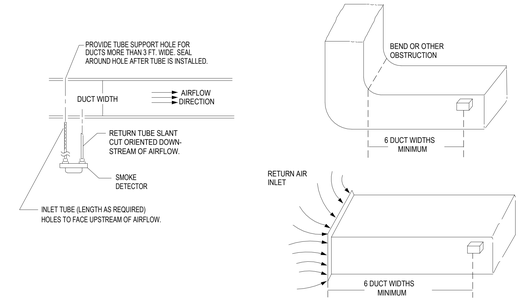
N.T.S.



R1 FAN SHUTDOWN RELAY
R2 FAN START/OVERRIDE RELAY
R3 STATUS RELAY

FAN SHUTDOWN WIRING DIAGRAM

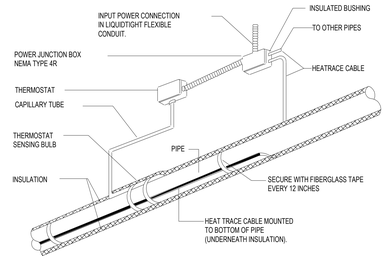
N.T.S.



NOTE:
1. DUCT DETECTOR LOCATIONS SHALL BE DETERMINED IN FIELD WITH ENGINEER AND FIRE ALARM VENDOR.

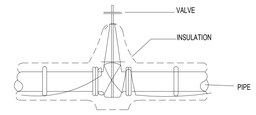
TYPICAL DUCT SMOKE DETECTOR
PLACEMENT & INSTALLATION DETAIL (PLAN VIEW)

N.T.S.



TYPICAL POWER AND CONTROL ARRANGEMENT

N.T.S.



TYPICAL TRACING PATTERN VALVES AND FITTINGS

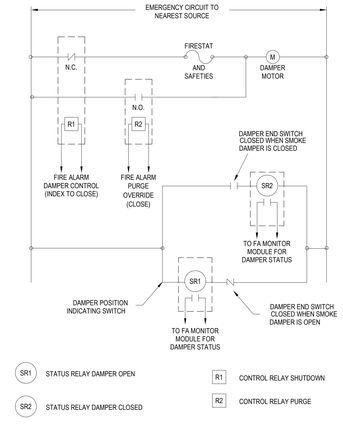
N.T.S.

TYPICAL PIPE HEAT TRACING INSTALLATION DETAIL

N.T.S.

NOTES:

1. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL AND/OR PLUMBING CONTRACTOR PRIOR TO INSTALLATION.
2. JUNCTION BOXES, THERMOSTATS, CAPILLARY TUBS AND TRACE CABLING SHALL BE FASTENED IN PLACE TO SUIT INSTALLATION IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
3. SPECIFIC MANUFACTURER'S INSTALLATION REQUIREMENTS SHALL TAKE PRECEDENCE OVER DETAILS REPRESENTED HERE.
4. PROVIDE WIRING LABELS ON ALL INSULATION OUTER JACKETS.
5. ALL HEAT TRACE CABLE SHALL BE HI-POT TESTED IN THE PRESENCE OF MANUFACTURERS REPRESENTATIVE PRIOR TO ENERGIZING.



SR1 STATUS RELAY DAMPER OPEN
SR2 STATUS RELAY DAMPER CLOSED
R1 CONTROL RELAY SHUTDOWN
R2 CONTROL RELAY PURGE

FIRE/SMOKE DAMPER WIRING DIAGRAM

N.T.S.

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28 PEARL STREET
PORTCHESTER, NY

ELECTRICAL DETAILS (3 OF 3)

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
DRAWN BY: MV/MD
CHECKED BY: Checker
PLOT DATE: 2/7/2025 12:24:36 PM
FILE NAME:

E-703

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FIRE PROTECTION SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

F	EXISTING FIRE SERVICE PIPING
F	NEW FIRE SERVICE PIPING
FSP	NEW FIRE STANDPIPE PIPING
DRY FSP	NEW DRY FIRE STANDPIPE PIPING
DR	NEW DRAIN PIPING
SPKR	NEW SPRINKLER PIPING
DRY SPKR	NEW DRY SPRINKLER PIPING
	ARROW REPRESENTS DIRECTION OF FLOW
	PIPING WITH FREEZE PROTECTION CABLE UNDER INSULATION
	BURIED FIRE SERVICE, FIRE STANDPIPE, OR SPRINKLER PIPING
	PIPING TO BE DEMOLISHED
	PIPE BREAK
	CAPPED OUTLET
	PIPE DROP / DOWN
	PIPE RISE / UP
	PIPE BOTTOM CONNECTION
	PIPE TOP CONNECTION
	PIPE SIDE CONNECTION
	VACUUM BREAKER
	WATERPROOF SLEEVE
	UNION
	PRESSURE GAUGE
T	TAMPER SWITCH
F	FLOW SWITCH
P	PRESSURE SWITCH
	FIRE HOSE VALVE
	FIRE HOSE VALVE
	FIRE HOSE VALVE AND CABINET
	SIAMESE FIRE DEPARTMENT CONNECTION
	FIRE PUMP TEST CONNECTION
	THREE-WAY ROOF MANIFOLD
	FLOOR CONTROL VALVE ASSEMBLY
	CHECK VALVE
	BALL VALVE
	GATE VALVE
	OUTSIDE SCREW & YOKE VALVE
	PRESSURE REDUCING VALVE
	SOLENOID VALVE
A	ALARM CHECK VALVE
	DRY PIPE CHECK VALVE
	POINT OF DISCONNECTION FROM EXISTING PIPING
	POINT OF CONNECTION TO EXISTING PIPING
X	HYDRAULIC REFERENCE POINT - NODE
X	HYDRAULIC REFERENCE POINT - ELEMENT

FIRE PROTECTION ABBREVIATIONS LIST

(NOT ALL ABBREVIATIONS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

ABD	AUTOMATIC BALL DRIP
AFF	ABOVE FINISHED FLOOR
AFP	AUTOMATIC FIRE PUMP
ATS	AUTOMATIC TRANSFER SWITCH
BLDG	BUILDING
BOP	BOTTOM OF PIPE
CLG	CEILING
CONN	CONNECT / CONNECTION
CONT	CONTINUE / CONTINUATION
CV	CHECK VALVE
DIA	DIAMETER
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER
DCV	DOUBLE CHECK VALVE BACKFLOW PREVENTER
DN	DOWN (PENETRATES FLOOR SLAB)
DR	DRAIN
DWG	DRAWING
EX	EXISTING
FCV	FLOOR CONTROL VALVE ASSEMBLY
F	FIRE SERVICE
FDC	FIRE DEPARTMENT CONNECTION
FL	FLOOR
FS	FLOW SWITCH
FSP	FIRE STANDPIPE
FT	FEET
GV	GATE VALVE
GAL	GALLONS
GPM	GALLONS PER MINUTE
HCLG	HUNG CEILING
HV	FIRE HOSE VALVE
IN	INCH
JP	JOCKEY PUMP
MAX	MAXIMUM
MB	MANUFACTURED BY
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OS&Y	OUTSIDE SCREW & YOKE VALVE
PC	PLUMBING CONTRACTOR
PRHV	PRESSURE REGULATING HOSE VALVE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH - GAUGE
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
SPDR	STANDPIPE DRAIN
SPKR	SPRINKLER(S)
SQFT	SQUARE FEET
TS	TAMPER SWITCH
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UP	UP (PENETRATES FLOOR SLAB)

FIRE PROTECTION GENERAL NOTES

1. ALL REFERENCES HEREIN TO THE CONTRACTOR SHALL REFER TO THE FIRE PROTECTION CONTRACTOR UNLESS OTHERWISE NOTED.
2. THE ENTIRE INSTALLATION SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE EXACT LOCATION OF ALL EXISTING FIRE PROTECTION SYSTEMS PRIOR TO MAKING NEW CONNECTIONS TO EXISTING LINES. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
3. DO NOT SCALE FROM THESE DRAWINGS.
4. DO NOT MAKE ANY CHANGES OR SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN APPROVAL FROM THE ARCHITECT OR ENGINEER.
5. THE CONTRACTOR SHALL REFER TO WRITTEN SPECIFICATION IN CONJUNCTION WITH THESE DRAWINGS FOR FULL PROJECT SCOPE.
6. ANY DISCREPANCIES OR INADEQUACIES WITHIN BID DOCUMENTS, BETWEEN THESE BID DOCUMENTS AND RELATED HVAC, PLUMBING, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, INTERIOR DECOR, AND STRUCTURAL BID DOCUMENTS, OR BETWEEN THESE BID DOCUMENTS AND FIELD CONDITIONS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO BID SUBMISSION.
7. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF RECORD "AS BUILT" DRAWINGS INDICATING THE PRECISE LOCATION OF ALL SYSTEMS, EQUIPMENT, CONCEALED OR EMBEDDED PIPING, EXPOSED PIPING, PIPING CONNECTIONS, AND SPRINKLER HEADS. THESE DRAWINGS SHALL INCLUDE ALL CHANGES AND DEVIATIONS FROM CONSTRUCTION DOCUMENTS.
8. THE CONTRACTOR SHALL SCHEDULE ALL WORK TO AVOID INTERFERENCE WITH FIRE PROOFING WORK.THE CONTRACTOR SHALL COORDINATE ALL LOCATIONS OF SPRINKLER HEADS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS, HVAC LAYOUT, AND ELECTRICAL LIGHTING LAYOUT PRIOR TO ANY FABRICATION OR INSTALLATION.
9. THE CONTRACTOR SHALL SUBMIT SHOP DRAWING LAYOUTS FOR ARCHITECTURAL/ENGINEERING APPROVAL.PLATFORMS AND CURBS FOR FIRE PROTECTION EQUIPMENT SHALL BE AS INDICATED ON THE STRUCTURAL AND ARCHITECTURAL DRAWINGS UNLESS NOTED OTHERWISE.
10. THE CONTRACTOR SHALL COORDINATE EXACT SIZES AND LOCATIONS OF REQUIRED OPENINGS AND SUPPORTS FOR FURNISHED EQUIPMENT.
11. THE CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS OF ALL FIRE PROTECTION EQUIPMENT WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR.
12. THE CONTRACTOR SHALL FURNISH PLUMBING EQUIPMENT WIRED FOR THE VOLTAGES SHOWN IN CONTRACT DOCUMENTS AND COORDINATED WITH ELECTRICAL CONTRACTOR.
13. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL APPLICABLE CODES.
14. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, TRANSITIONS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
15. THE CONTRACTOR SHALL SUBMIT, PRIOR TO ANY FABRICATION OR INSTALLATION, ALL NECESSARY DRAWINGS, EQUIPMENT/MATERIAL PRODUCT DATA, DOCUMENTATION, AND CALCULATIONS REQUIRED TO COMPLETE THE WORK OUTLINED IN THE CONTRACT DOCUMENTS.
16. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION PRIOR TO ANY FABRICATION OR INSTALLATION. ALL FEES FOR PERMITS AND INSPECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
17. THE CONTRACTOR SHALL PROVIDE A TEMPORARY STANDPIPE AND/OR FIRE WATCH DURING CONSTRUCTION WHEN REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.SPRINKLER SYSTEM HAZARD CLASSIFICATION SHALL BE AS NOTED IN THE SPRINKLER SYSTEM DESIGN CRITERIA SCHEDULE UNLESS OTHERWISE NOTED.
18. ALL UNREFERENCED AREAS SHALL BE CLASSIFIED AS PER NFPA 13.
19. THE CONTRACTOR SHALL PROVIDE APPROVED SIGNAGE IDENTIFYING ALL CONTROL VALVES AND THE SYSTEMS/AREAS SERVED.THE CONTRACTOR SHALL PERFORM A HYDRANT FLOW TEST TO VERIFY THE AVAILABLE WATER SUPPLY PRESSURE PRIOR TO ANY PURCHASING OF EQUIPMENT, FABRICATION OR INSTALLATION.
20. SPRINKLER HEAD RESPONSE AND TEMPERATURE RATINGS SHALL BE AS NOTED IN THE SPRINKLER HEAD SCHEDULE UNLESS OTHERWISE NOTED.
21. ALL UNREFERENCED HEADS/AREAS SHALL BE CLASSIFIED AS PER NFPA 13.
22. PIPE SIZING AND LAYOUT OF THE INSTALLATION DRAWINGS SHALL BE DETERMINED BY THE CONTRACTORS HYDRAULIC CALCULATIONS AND COORDINATION WITH THE INSTALLATION OF ALL OTHER TRADES.
23. THE CONTRACTOR SHALL ALLOW FOR THIS AND SHALL INCLUDE THIS IN THE CONTRACT PRICE.
24. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED HYDRAULIC CALCULATIONS CORRESPONDING TO THEIR PIPE SIZING AND LAYOUT.

FIRE PROTECTION RISER TAG SCHEDULE

SP 1	RISER DESIGNATION	SPRINKLER RISER DESIGNATION
	RISER NUMBER	
FSP 1	RISER DESIGNATION	COMBINED FIRE/SPRINKLER RISER DESIGNATION
	RISER NUMBER	

FIRE PROTECTION HYDRANT FLOW TEST DATA

DATE PERFORMED	XX/XX/XXXX
TEST LOCATION	XXX
STATIC PRESSURE	XX PSIG
RESIDUAL PRESSURE	XX PSIG
RESIDUAL FLOW	XXXX GPM
DATA SOURCE	XXXX

FIRE PROTECTION SPRINKLER HEAD LEGEND

SYMBOL	MANUFACTURER	MODEL NUMBER	
	VIKING	VK450	STANDARD HORIZONTAL SIDEWALL-RESIDENTIAL UNITS
	VIKING	VK456	CONCEALED PENDANT-RESIDENTIAL UNITS
D	VIKING	VK182	HORIZONTAL SIDEWALL-DRY
	VIKING	VK3255	CONCEALED PENDANT-DRY
	VIKING	VK305	STANDARD HORIZONTAL SIDEWALL
	VIKING	VK302	STANDARD PENDANT
	VIKING	VK300	STANDARD UPRIGHT
	VIKING	VK462	CONCEALED PENDANT

NOTES:

1. FINISH/COLOR SELECTION BY ARCHITECT.
2. EXPOSED UPRIGHT HEADS IN OCCUPIED SPACES SHALL BE CHROME FINISH.
3. PROVIDE ESCUTCHEONS AT ALL EXPOSED WALL PENETRATIONS.
4. PROVIDE SPRINKLER GUARDS AT ALL SPRINKLER HEADS 7'-0" AND LOWER.

FIRE PROTECTION PIPE FITTING AND JOINT MATERIAL SCHEDULE

(NOT ALL PIPE, FITTING, AND JOINT MATERIALS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

PIPING SYSTEM	PIPING LOCATION	PIPING SIZE	PIPING SPECIFICATION	FITTING SPECIFICATION	JOINT SPECIFICATION
WET FIRE STANDPIPE	ABOVE GROUND WITHIN BUILDING	ALL	SCHEDULE 10 BLACK STEEL WITH GROOVED ENDS	DUCTILE OR MALLEABLE IRON WITH THREADED ENDS	BOLT-ON MECHANICAL JOINT WITH HIGH QUALITY EPDM GASKET
WET SPRINKLER	ABOVE GROUND WITHIN BUILDING	2" & SMALLER	SCHEDULE 40 BLACK STEEL	DUCTILE OR MALLEABLE IRON WITH THREADED ENDS	THREADED
		2 1/2" & LARGER	SCHEDULE 10 BLACK STEEL WITH GROOVED ENDS	DUCTILE IRON WITH GROOVED ENDS	BOLT-ON MECHANICAL JOINT WITH HIGH QUALITY EPDM GASKET
DRY SPRINKLER	ABOVE GROUND PARKING AREAS	2" & SMALLER	SCHEDULE 40 BLACK STEEL FIELD PAINTED	DUCTILE OR MALLEABLE IRON WITH THREADED ENDS FIELD PAINTED	THREADED
		2 1/2" & LARGER	SCHEDULE 10 BLACK STEEL WITH GROOVED ENDS FIELD PAINTED	DUCTILE IRON WITH GROOVED ENDS FIELD PAINTED	BOLT-ON MECHANICAL JOINT WITH HIGH QUALITY EPDM GASKET

FIRE PROTECTION DESIGN CRITERIA

(NOT ALL CRITERIA SHOWN ARE NECESSARILY APPLICABLE TO THIS PROJECT)

OCCUPANCY CLASS	DESIGN DENSITY	APPLICATION AREA	MAX AREA PER HEAD	"K" FACTOR	ORIFICE SIZE	APPLICABLE AREAS
LIGHT HAZARD	0.10 GPM/SQFT	1500 SQFT	225 SQFT	5.60	1/2 IN	OFFICES, CORRIDORS, TOILET ROOMS, AND CLASSROOMS
ORDINARY HAZARD	0.16 GPM/SQFT	1500 SQFT	130 SQFT	5.60	1/2 IN	LOADING DOCKS, MECHANICAL, TRASH, STORAGE ROOMS, AND KITCHENS
EXTRA HAZARD	0.30 GPM/SQFT	2500 SQFT	100 SQFT	5.60	1/2 IN	NOT APPLICABLE ON THIS PROJECT

FIRE PROTECTION SPRINKLER HEAD BRANCH PIPING TABLE

1"	2 SPRINKLERS
1 1/4"	3 SPRINKLERS
1 1/2"	5 SPRINKLERS
2"	10 SPRINKLERS
2 1/2"	30 SPRINKLERS
3"	60 SPRINKLERS
3 1/2"	100 SPRINKLERS
4"	SEE SECTION 8.2 NFPA 13

FIRE PROTECTION OPENING SLEEVE SCHEDULE

FIRE SERVICE, FIRE STANDPIPE, SPRINKLER, AND DRAIN PIPING		
PIPE DIAMETER	WALL / FLOOR SLEEVE DIAMETER	BEAM OPENING DIAMETER
1"	3"	2-1/2"
1-1/2"	3"	3"
2"	4"	3-1/2"
2-1/2"	4"	4"
3"	5"	4-1/2"
4"	6"	5-1/2"
5"	8"	6-1/2"
6"	8"	7-1/2"
8"	10"	9-1/2"

NEW YORK STATE CODES & STANDARDS

- 2020 BUILDING CODE OF NEW YORK STATE
- 2020 FIRE CODE OF NEW YORK STATE
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE
- 2020 FUEL GAS CODE OF NEW YORK STATE
- 2020 NYS UNIFORM CODE SUPPLEMENT
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL
- ALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

NEW YORK STATE ENERGY CODES

- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2016 ASHRAE 90.1
- 2020 SUPPLEMENT TO THE NEW YORK STATE ENERGY CONSERVATION CODE

LOCAL CODES

- PORTCHESTER MUNICIPAL CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2016 NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- 2016 NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
- 2016 NFPA 20 - STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE FOR PROTECTION.
- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE
- 2016 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE

FIRE PROTECTION SHEET LIST

SHEET NUMBER	SHEET NAME
FP-001	FIRE PROTECTION COVER SHEET
FP-101	FIRE PROTECTION CELLAR 2 & CELLAR 1 FLOOR PLAN
FP-102	FIRE PROTECTION FIRST FLOOR & UPPER ELEVATOR LOBBY FLOOR PLANS
FP-103	FIRE PROTECTION 2ND & TYPICAL (3RD-7TH) FLOOR PLANS
FP-104	FIRE PROTECTION 8TH & 9TH FLOOR PLANS
FP-105	FIRE PROTECTION BUILDING ROOF
FP-201	FIRE PROTECTION TYPICAL UNIT PLANS
FP-701	FIRE PROTECTION DETAILS
FP-702	FIRE PROTECTION DETAILS

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28 PEARL STREET
PORTCHESTER, NY

FIRE PROTECTION COVER SHEET

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: B2R24080
DRAWN BY: AR/DWH/PL/JOK
CHECKED BY: JOK
PLOT DATE: 2/7/2025 12:50:42 PM
FILE NAME:

FP-001

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1 FIRE PROTECTION CELLAR 1 PLAN
1/8" = 1'-0"



2 FIRE PROTECTION CELLAR 2 PLAN
1/8" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

FIRE PROTECTION CELLAR 2 & CELLAR 1 FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

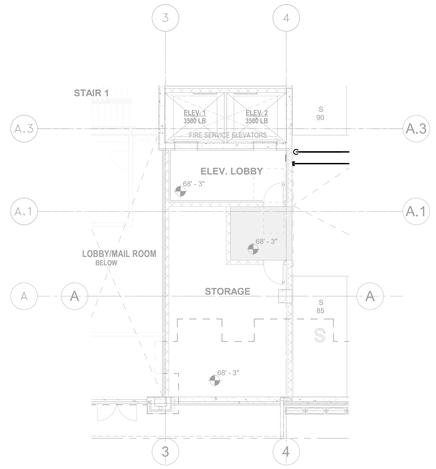
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FP-101

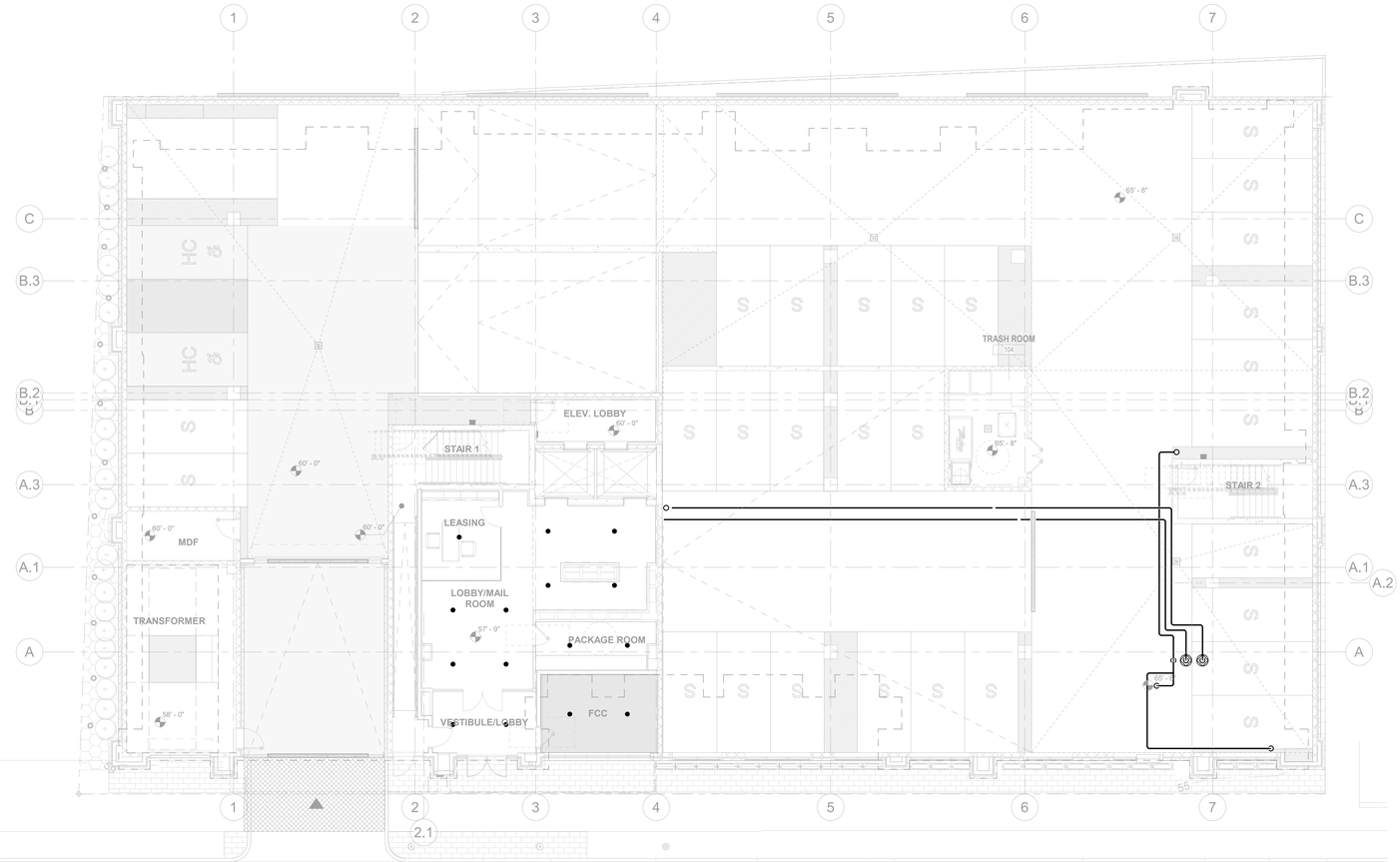
PROJECT NORTH

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2 FIRE PROTECTION UPPER ELEVATOR LOBBY FLOOR PLAN
1/8" = 1'-0"



1 FIRE PROTECTION FIRST FLOOR PLAN
1/8" = 1'-0"

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FIRE PROTECTION FIRST FLOOR & UPPER ELEVATOR LOBBY FLOOR PLANS

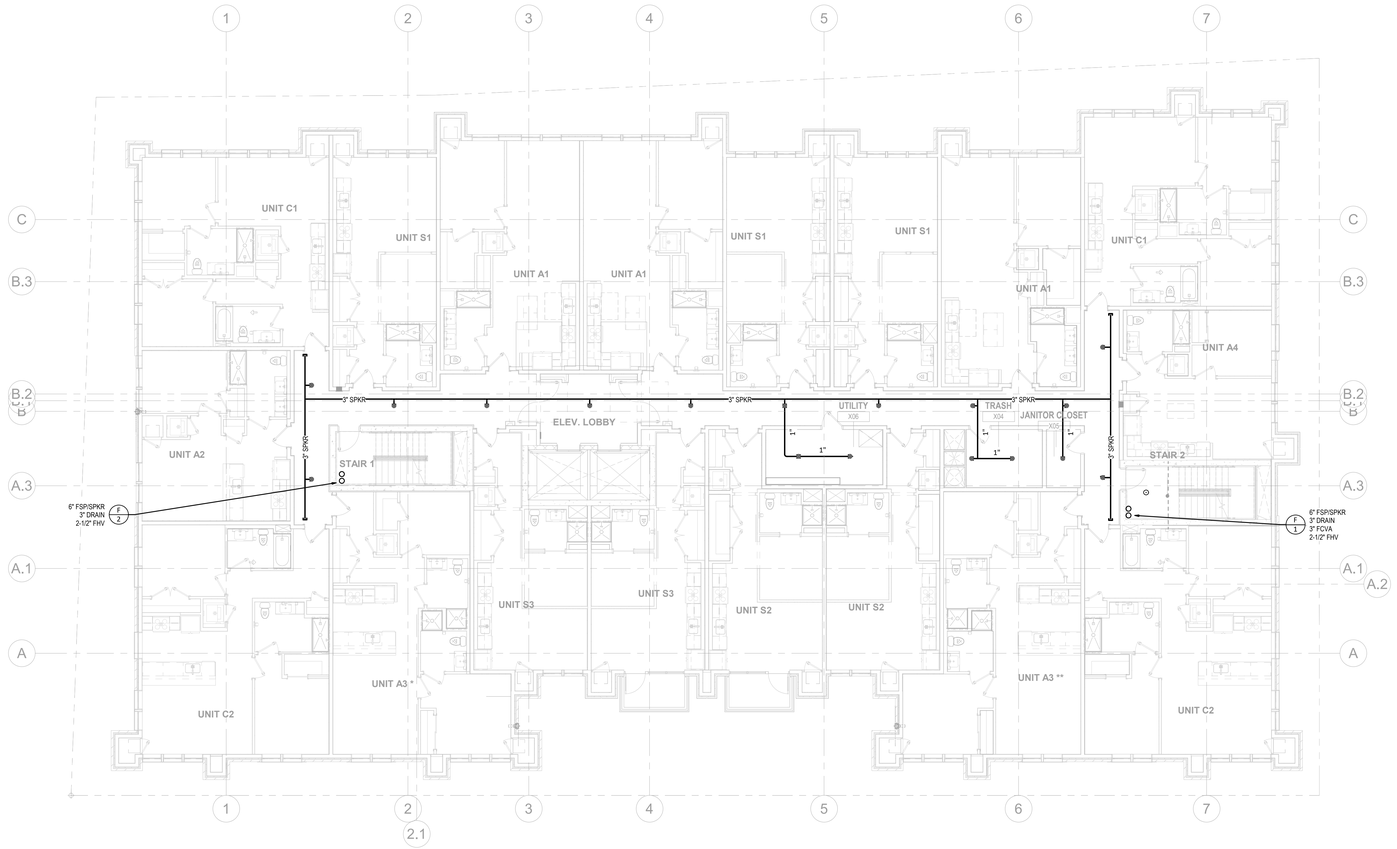
28 PEARL STREET
PORTCHESTER, NY

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	25% DD SUBMISSION	12/13/24

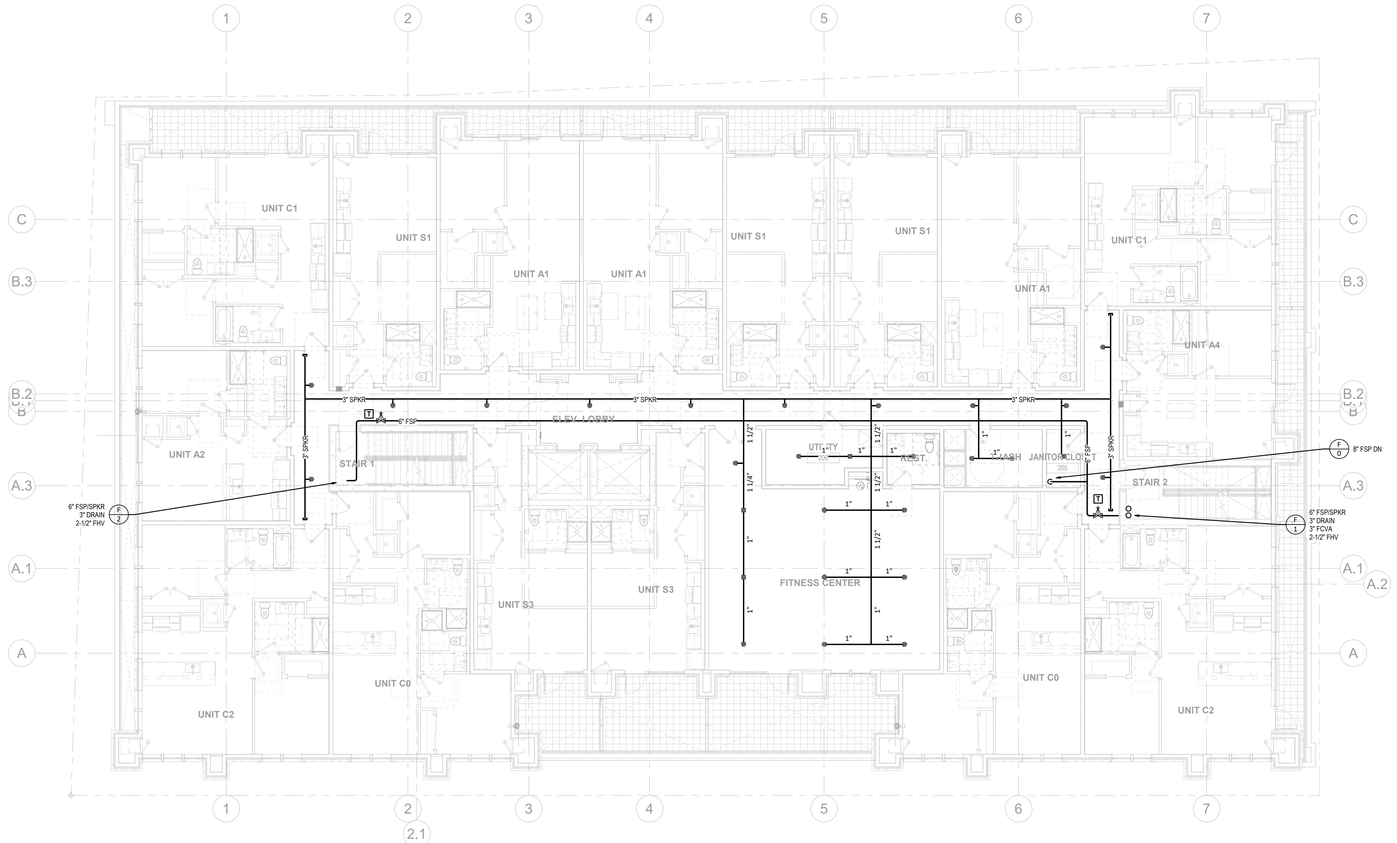
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FILE NAME:

PROJECT NORTH

FP-102



2 FIRE PROTECTION 3RD-7TH FLOOR PLAN
1/8" = 1'-0"



1 FIRE PROTECTION 2ND FLOOR PLAN
1/8" = 1'-0"

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PORTCHESTER, NY

FIRE PROTECTION 2ND & TYPICAL (3RD-7TH) FLOOR PLANS

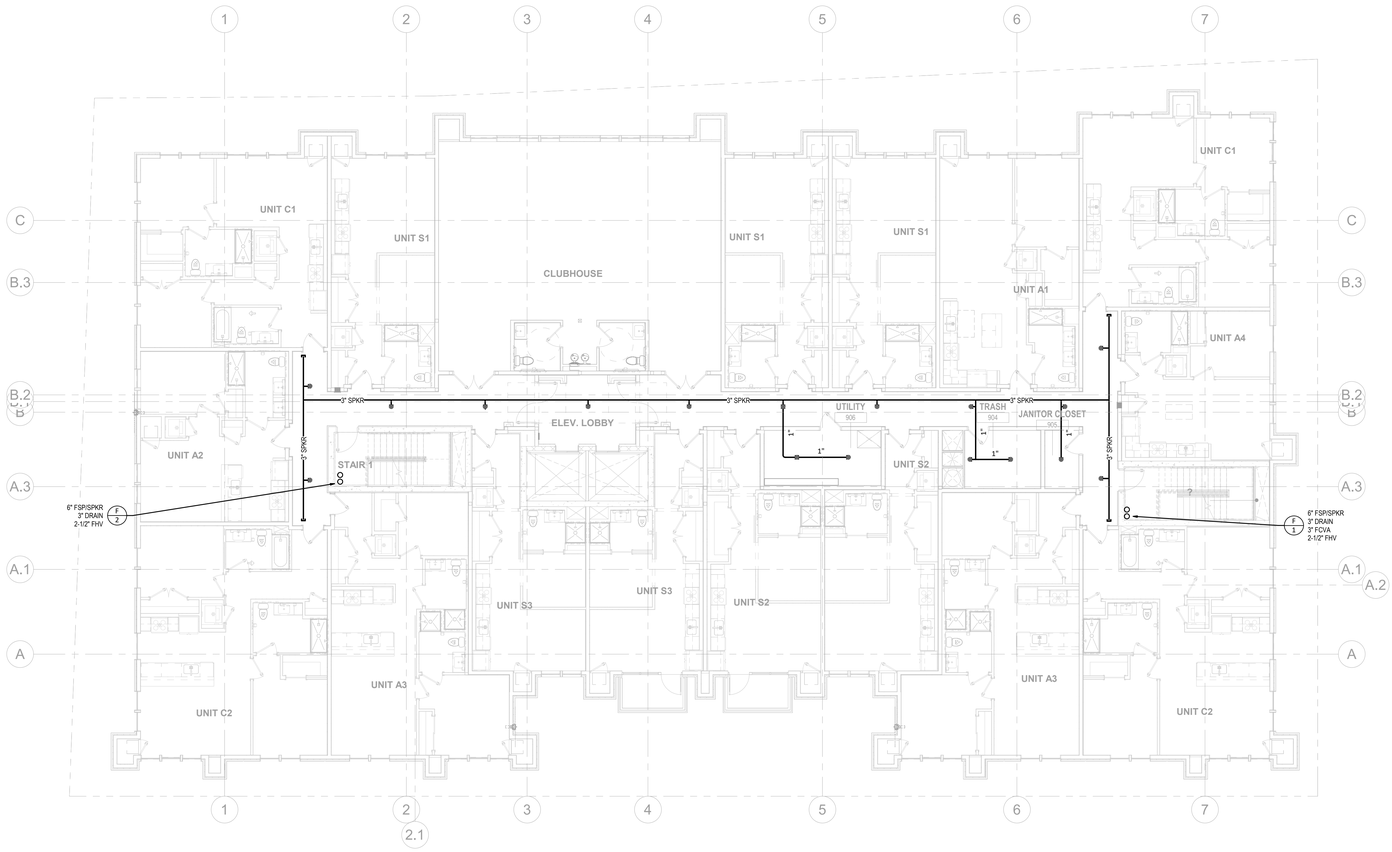
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	25% DD SUBMISSION	12/13/24

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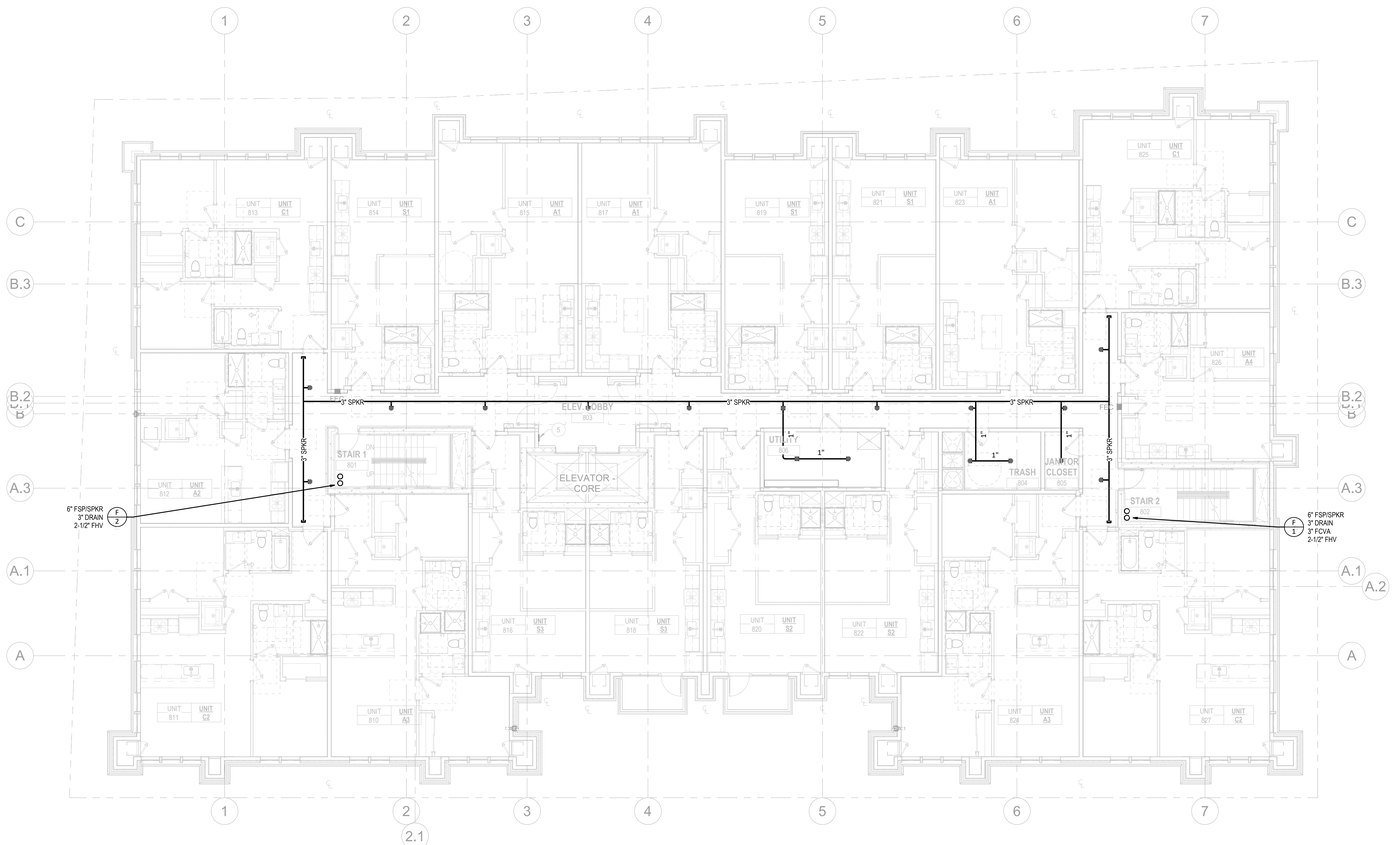
FP-103

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2 FIRE PROTECTION 9TH FLOOR PLAN
1/8" = 1'-0"



1 FIRE PROTECTION 8TH FLOOR PLAN
1/8" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

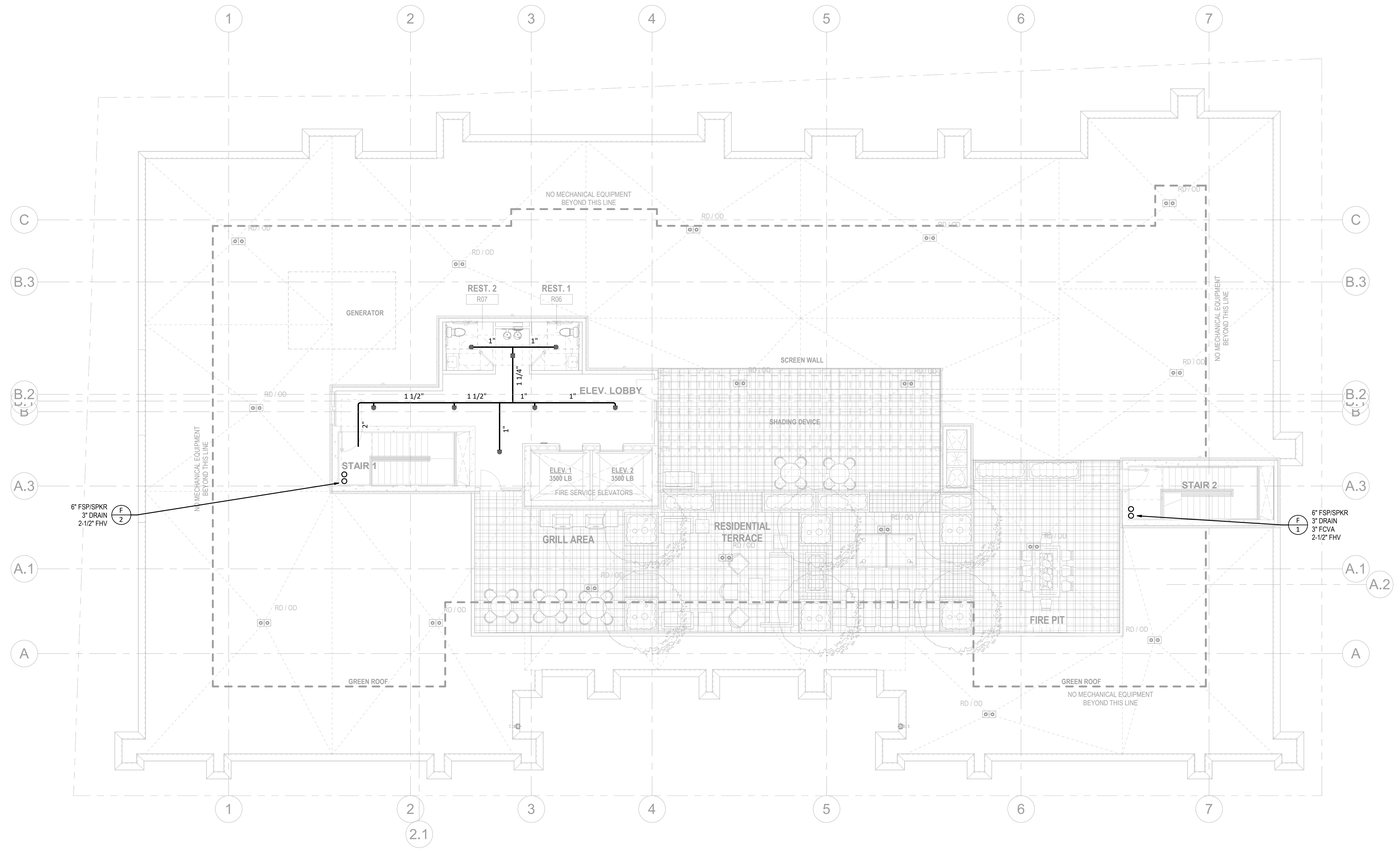
FIRE PROTECTION 8TH & 9TH FLOOR PLANS

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

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DRAWN BY: AR/DWH/PL
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FP-104

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1 FIRE PROTECTION BUILDING ROOF PLAN
1/8" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

FIRE PROTECTION BUILDING ROOF

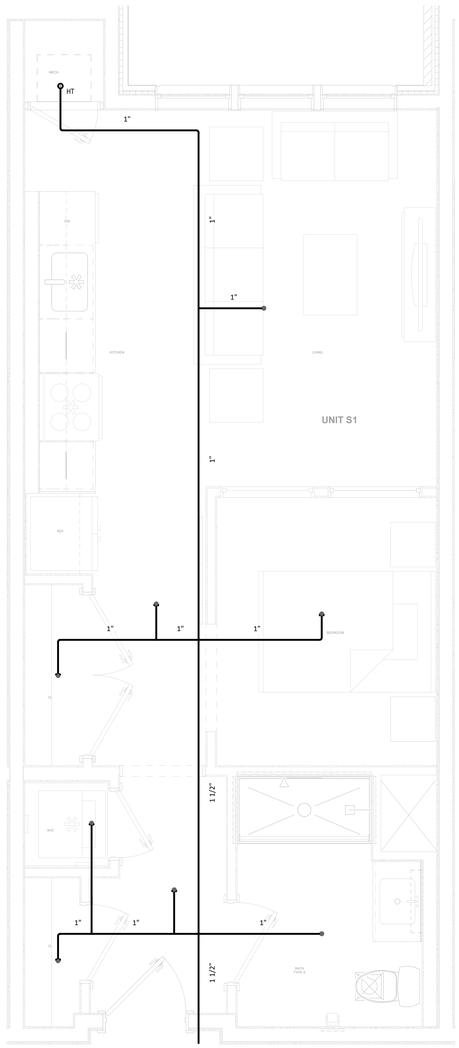
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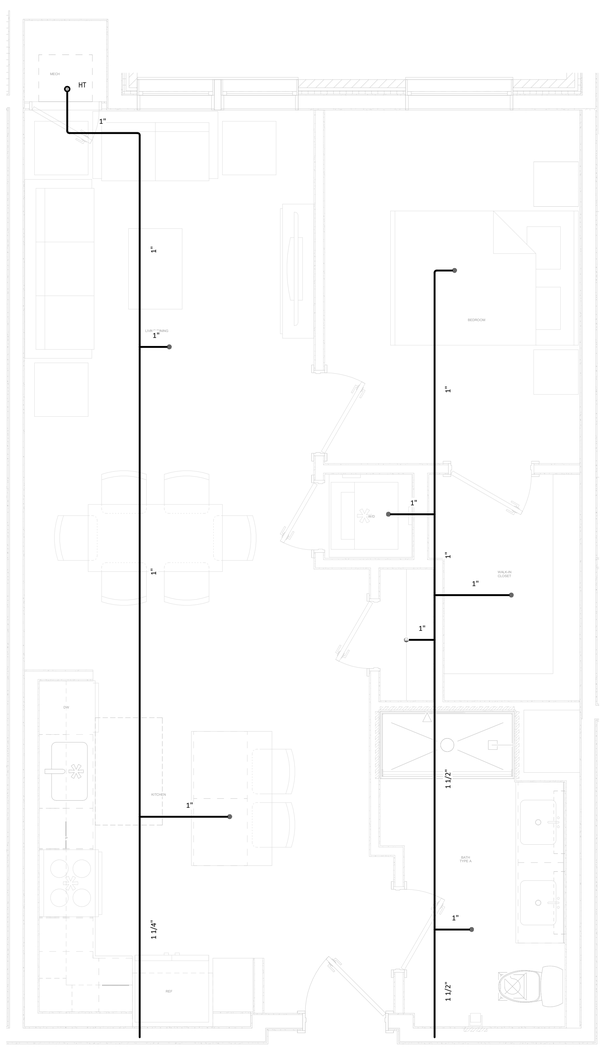
PROJECT NORTH

FP-105

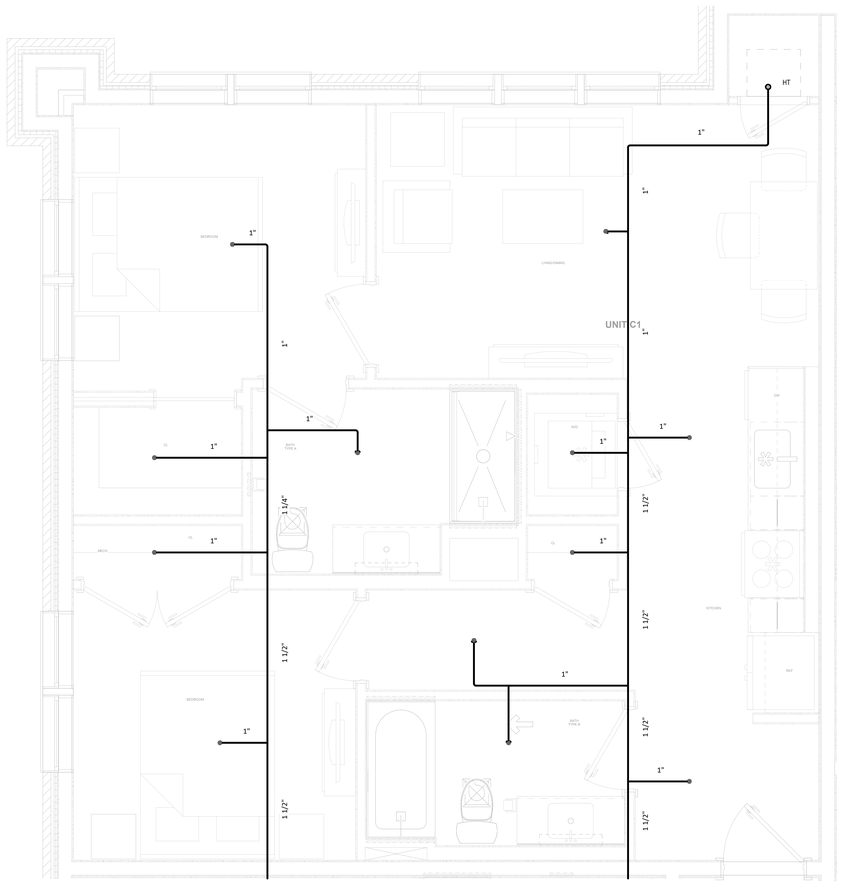
Autodesk Docs://Pearl Development - SAC001A - 28 Pearl St/B2R24080_Pearl St_MEP R25.rvt



1 UNIT S1
1/2" = 1'-0"



2 UNIT A1
1/2" = 1'-0"



3 UNIT C1
1/2" = 1'-0"

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28 PEARL STREET
PORTCHESTER, NY

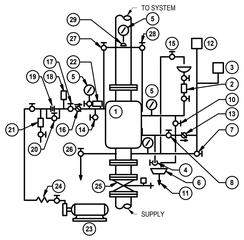
FIRE PROTECTION TYPICAL UNIT PLANS

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	25% DD SUBMISSION	12/13/24

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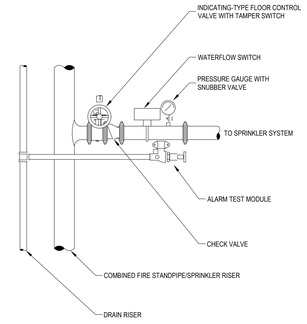
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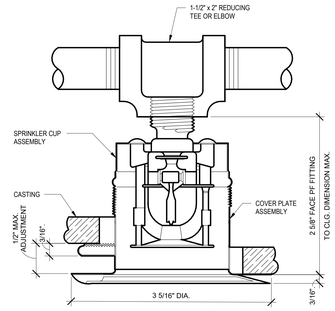


SYSTEM COMPONENTS			
1	DRY-PIPE VALVE	16	AIR-LINE CHECK VALVE
2	PRIMING CHAMBER AND CUP	17	AIR SUPPLY CONTROL VALVE
3	LOCAL-ALARM EQUIPMENT	18	PRESSURE-RELIEF VALVE
4	BALL DRIP VALVE	19	RESTRICTED ORIFICE
5	AIR PRESSURE GAUGE	20	AIR-LINE BYPASS
6	DRIP CUP	21	CONDENSATE CHAMBER
7	ALARM TEST VALVE (NORMALLY SHUT)	22	PRESSURE SWITCH FOR LOCAL LOW-AIR-PRESSURE
8	ALARM SHUT-OFF VALVE	23	AIR COMPRESSOR
9	WATER-PRESSURE GAUGE	24	FLEXIBLE CONNECTION
10	MAIN DRAIN VALVE	25	CONTROL VALVE WITH T.S.
11	DRIP-CUP DRAIN - SPILL TO F.D.	26	DRAIN VALVE-SPILL TO F.D.
12	CODED ALARM TRANSMITTER OR RELAY	27	ACCELERATOR AIR SUPPLY VALVE
13	CHECK VALVE TO PREVENT TRIPPING VALVE WITH ALARM	28	ACCELERATOR SHUT-OFF VALVE
14	PRIMING-WATER TEST COCKS, HIGH AND LOW I	29	ACCELERATOR
15	PRIMING-WATER SUPPLY VALVE		

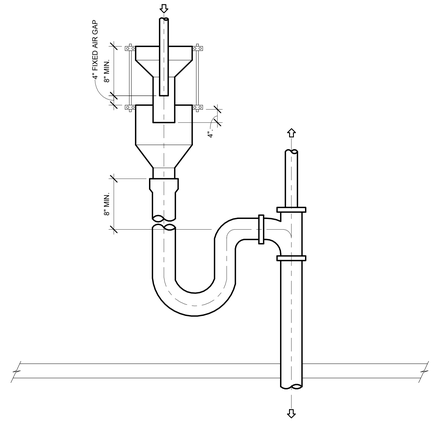
SPRINKLER DRY-PIPE VALVE DETAIL
NTS



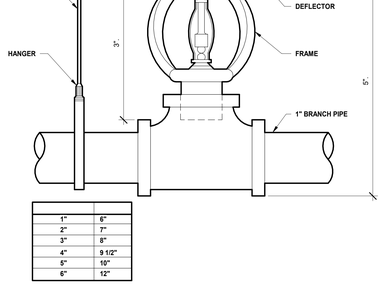
SPRINKLER FLOOR CONTROL VALVE ASSEMBLY (FCV) DETAIL FOR PRESSURES OF 175 PSI AND UNDER
NTS



CONCEALED SPRINKLER HEAD
NTS

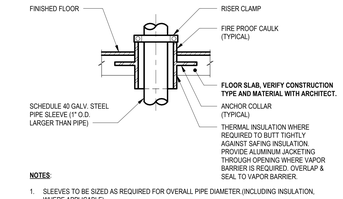


ANTI-SPLASH STANDPIPE DRAIN DETAIL
NTS



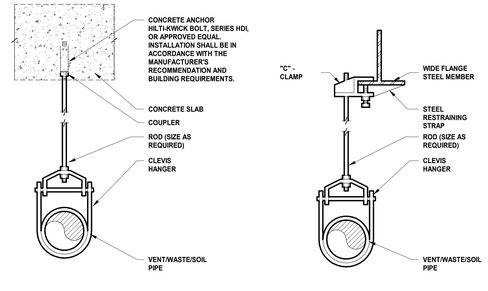
1"	6"
2"	7"
3"	8"
4"	9 1/2"
5"	10"
6"	12"

STANDARD HANGER DETAIL
NTS



NOTES:
1. SLEEVES TO BE SIZED AS REQUIRED FOR OVERALL PIPE DIAMETER (INCLUDING INSULATION, WHERE APPLICABLE)
2. RISER CLAMPS FOR COPPER PIPING SHALL BE COPPER PLATED.

TYPICAL PIPE SLEEVE PENETRATION OF FLOOR INSTALLATION DETAIL
NTS



NOTES:

1. CLEVIS HANGERS REQUIRED ON PIPING LARGER THAN 1".

TYPICAL HANGAR DETAILS
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28 PEARL STREET
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FIRE PROTECTION DETAILS

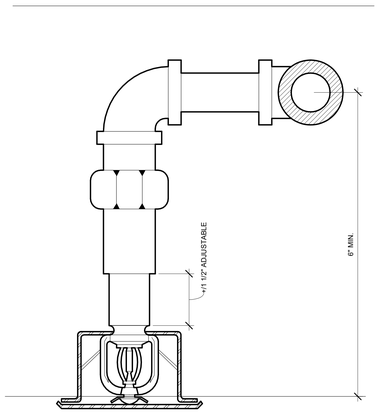
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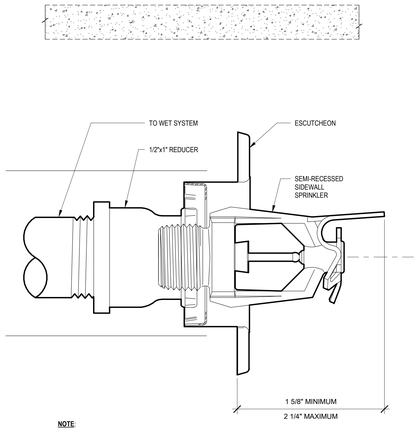
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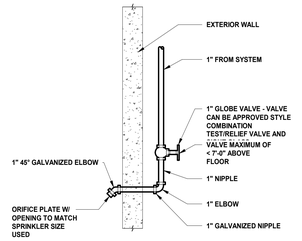
CONCEALED SPRINKLER HEAD BRANCHLINE CONNECTION
NTS



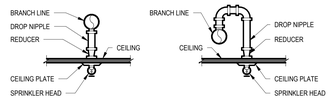
NOTE:

1. REFER TO APPROPRIATE NFPA INSTALLATION STANDARDS TO INSTALLATION GUIDELINES.
2. COORDINATE WITH ARCHITECT FOR ESCUTCHEON AND SPRINKLER HEAD FINISH.

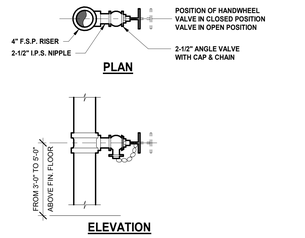
SEMI-RECESSED SIDEWALL SPRINKLER DETAIL
NTS



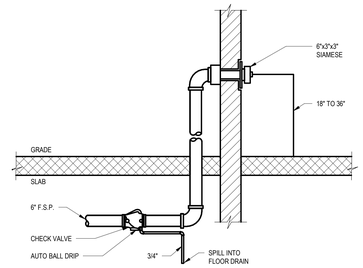
INSPECTOR'S TEST CONNECTIONS - WET SYSTEM
NTS



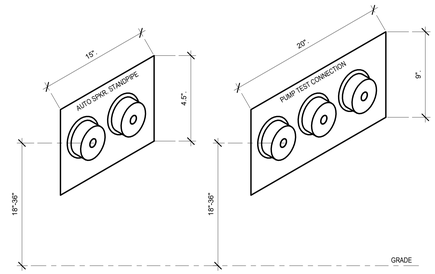
SPRINKLER BRANCH CONNECTION DETAIL
NTS



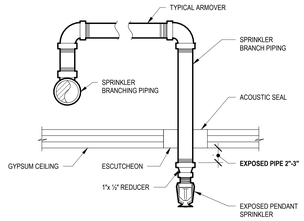
F.S.P VALVE WITH CAP AND CHAIN DETAIL
NTS



FIRE DEPARTMENT CONNECTION DETAIL - FLUSH MOUNT
NTS



FIRE DEPARTMENT CONNECTION & TEST HEADER PLATE DETAIL
NTS

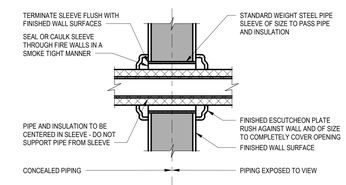


NOTES:

SEAL PENTRATIONS IN GYPSUM CEILING WITH 1" THICK, 1.5# DENSITY MINERAL WOOL AND FIRE PROOF CAULKING, PACKED AIRTIGHT; REFER TO ACOUSTICAL PENETRATION DETAILS FOR FURTHER REQUIREMENTS.

PROVIDE HEAD GUARDS ON ALL SPRINKLERS WITHIN SMALL AND MAIN GYMS.

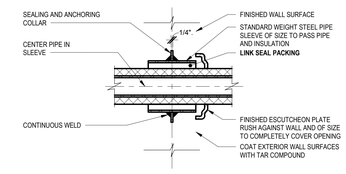
TYPICAL SPRINKLER AT SMALL & MAIN GYMS, AND CAFETERIA
NTS



INTERIOR WALLS

NOTES:

1. PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.



EXTERIOR WALLS

NOTES:

1. PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.

PIPE SLEEVES THRU WALL
NTS

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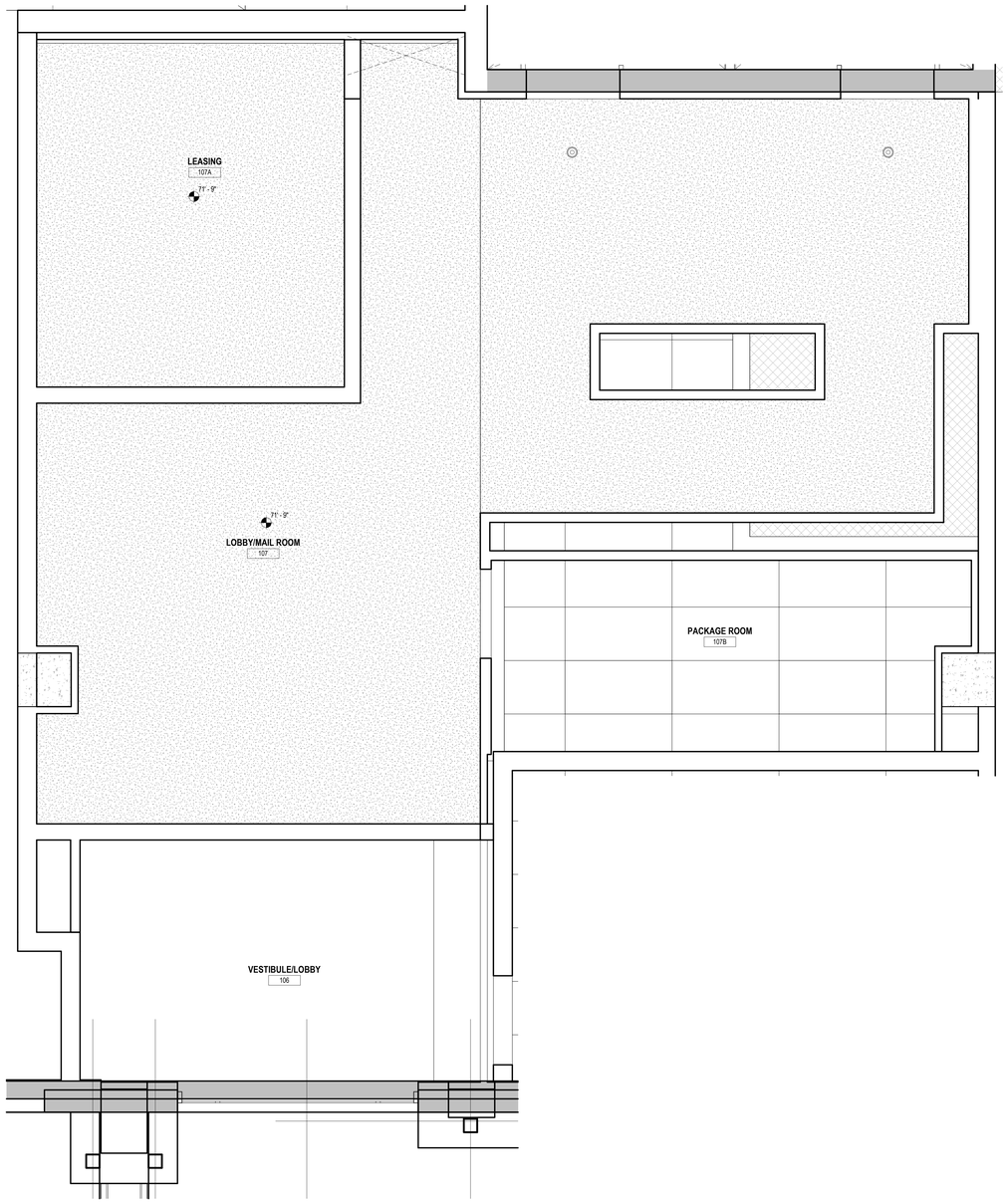
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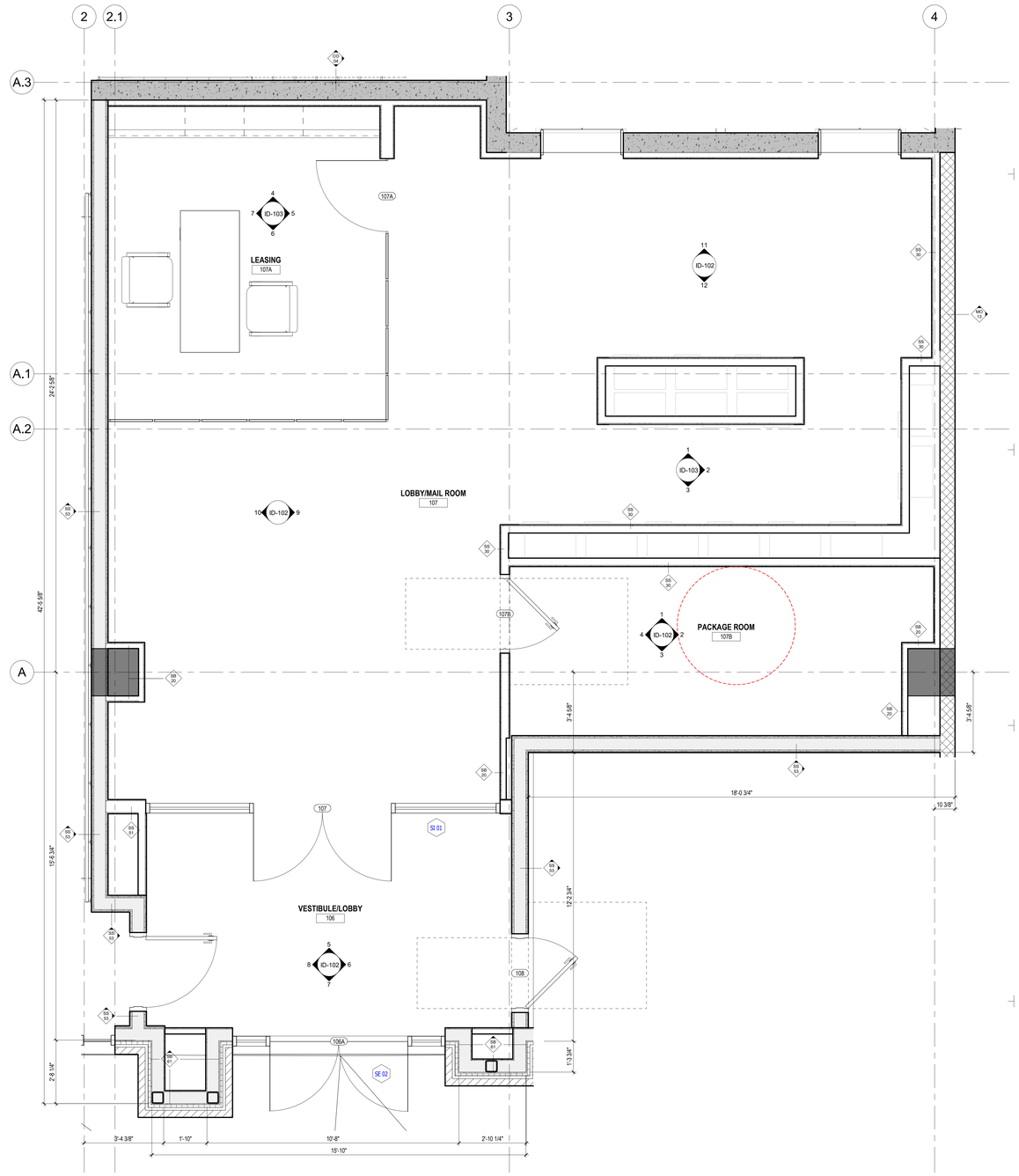
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2 ID-101 ENLARGED FIRST AMENITY RCP PLAN
Scale: 1/2" = 1'-0"



1 ID-101 ENLARGED GROUND AMENITY FLOOR PLAN
Scale: 1/2" = 1'-0"

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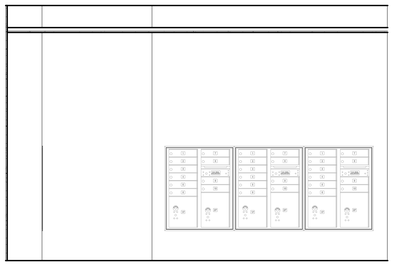
LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - ENLARGED FLOOR PLAN & RCP

NO.	DESCRIPTION	DATE
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	25% DD SUBMISSION	12/13/24

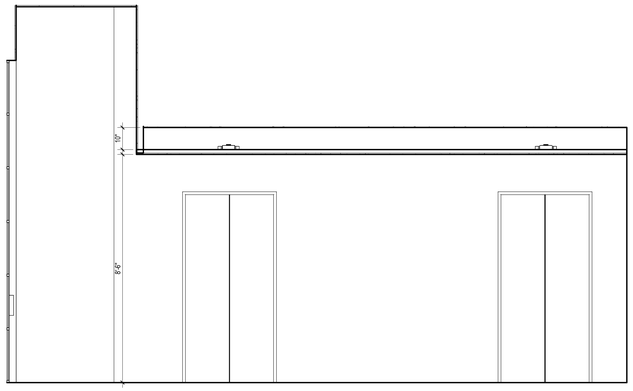
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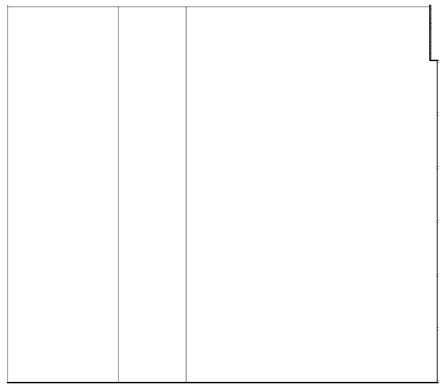
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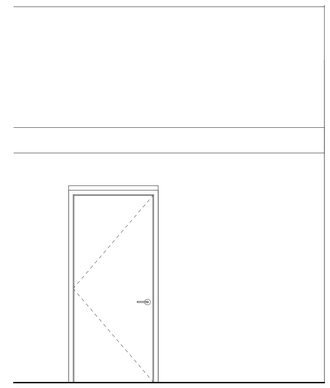
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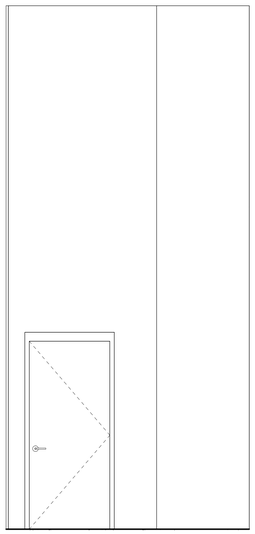
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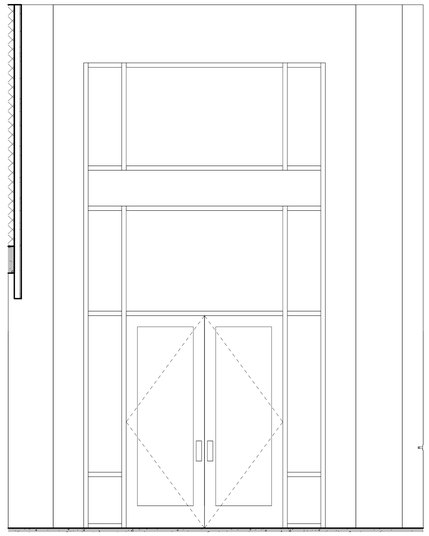
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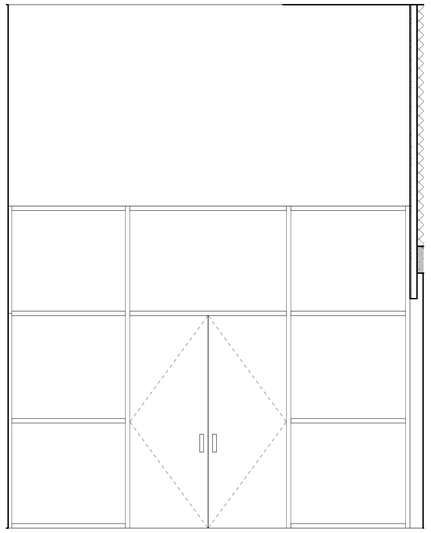
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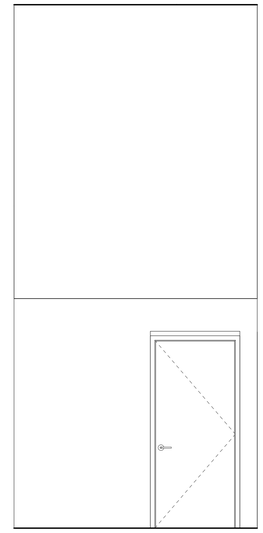
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Scale: 1/2" = 1'-0"



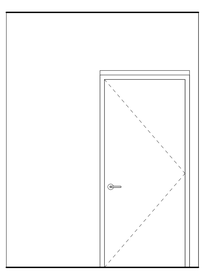
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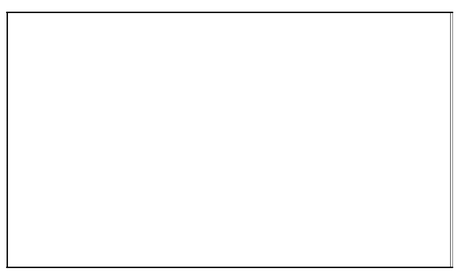
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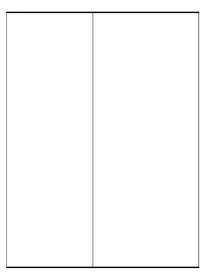
6 ID-102 VESTIBULE/LOBBY ELEVATION
Scale: 1/2" = 1'-0"



4 ID-102 PACKAGE ROOM ELEVATION
Scale: 1/2" = 1'-0"



3 ID-102 PACKAGE ROOM ELEVATION
Scale: 1/2" = 1'-0"



2 ID-102 PACKAGE ROOM ELEVATION
Scale: 1/2" = 1'-0"



1 ID-102 PACKAGE ROOM ELEVATION
Scale: 1/2" = 1'-0"

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LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - INTERIOR ELEVATIONS

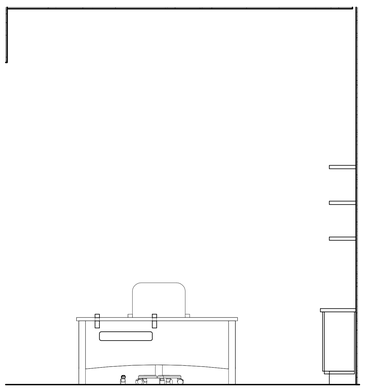
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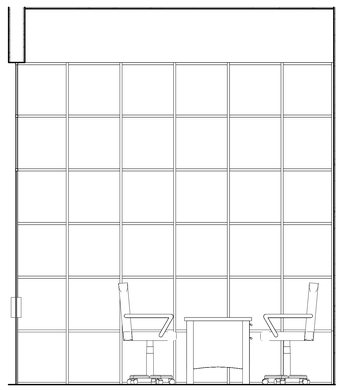
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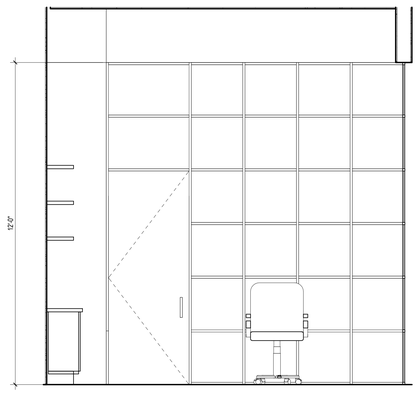
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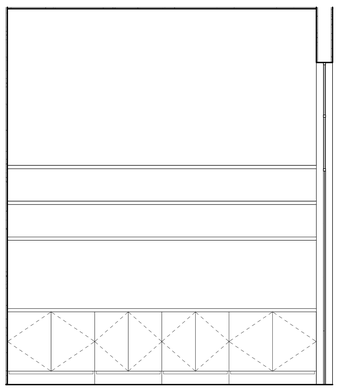
7 ID-103 LEASING ELEVATION
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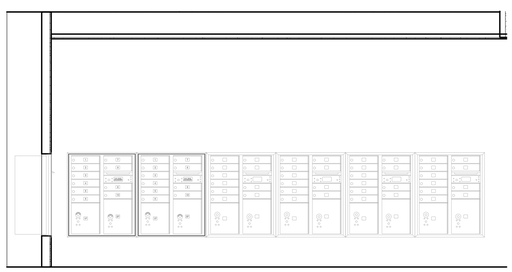
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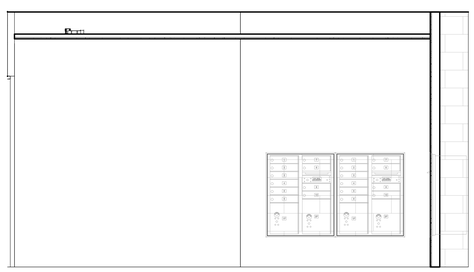
5 ID-103 LEASING ELEVATION
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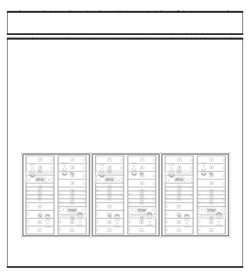
4 ID-103 LEASING ELEVATION
Scale: 1/2" = 1'-0"



3 ID-103 LOBBY/LEASING/MAIL ROOM ELEVATION
Scale: 1/2" = 1'-0"



2 ID-103 LOBBY/LEASING/MAIL ROOM ELEVATION
Scale: 1/2" = 1'-0"



1 ID-103 LOBBY/MAIL ROOM ELEVATION
Scale: 1/2" = 1'-0"

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LOBBY/ LEASING / MAILROOM / PACKAGE ROOM - INTERIOR ELEVATIONS

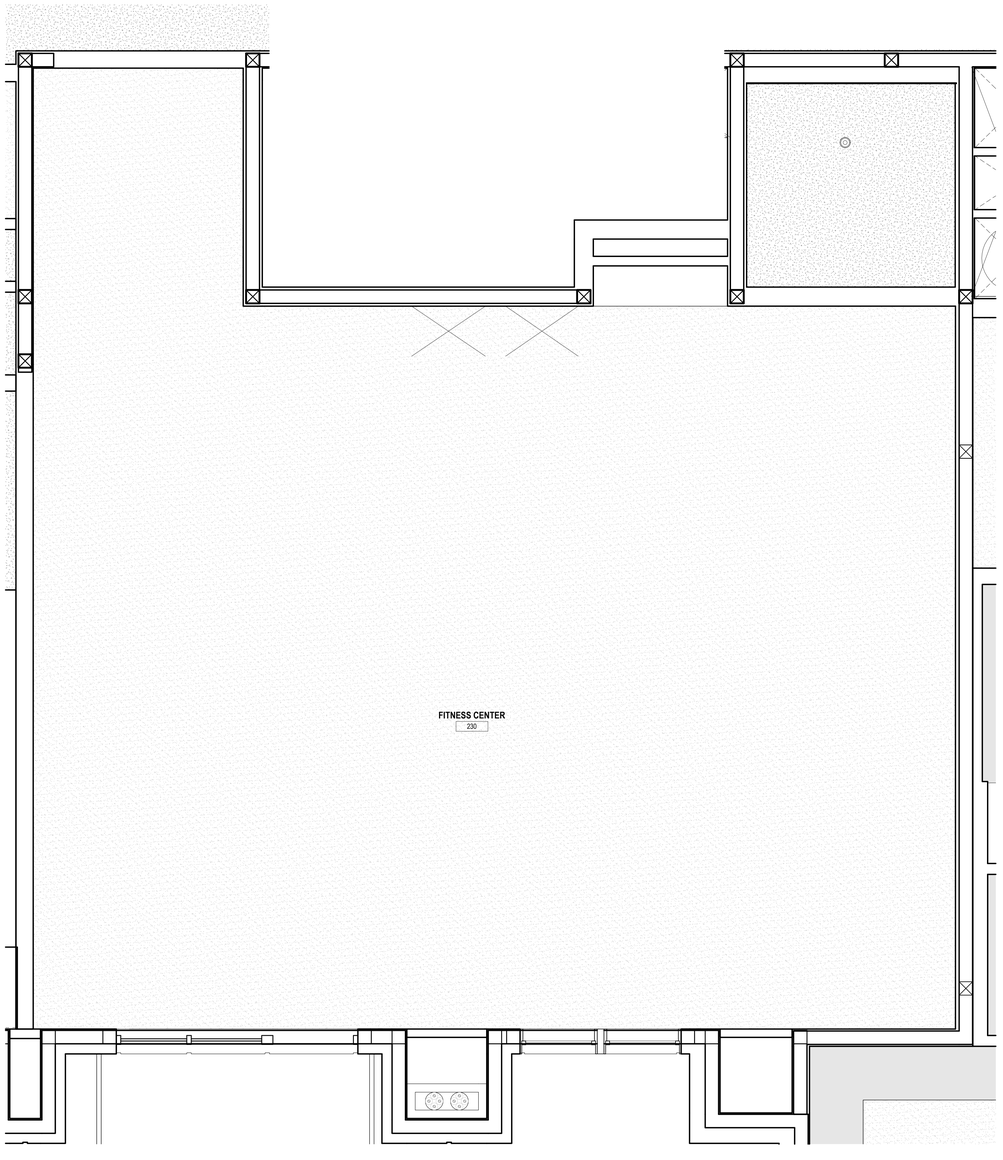
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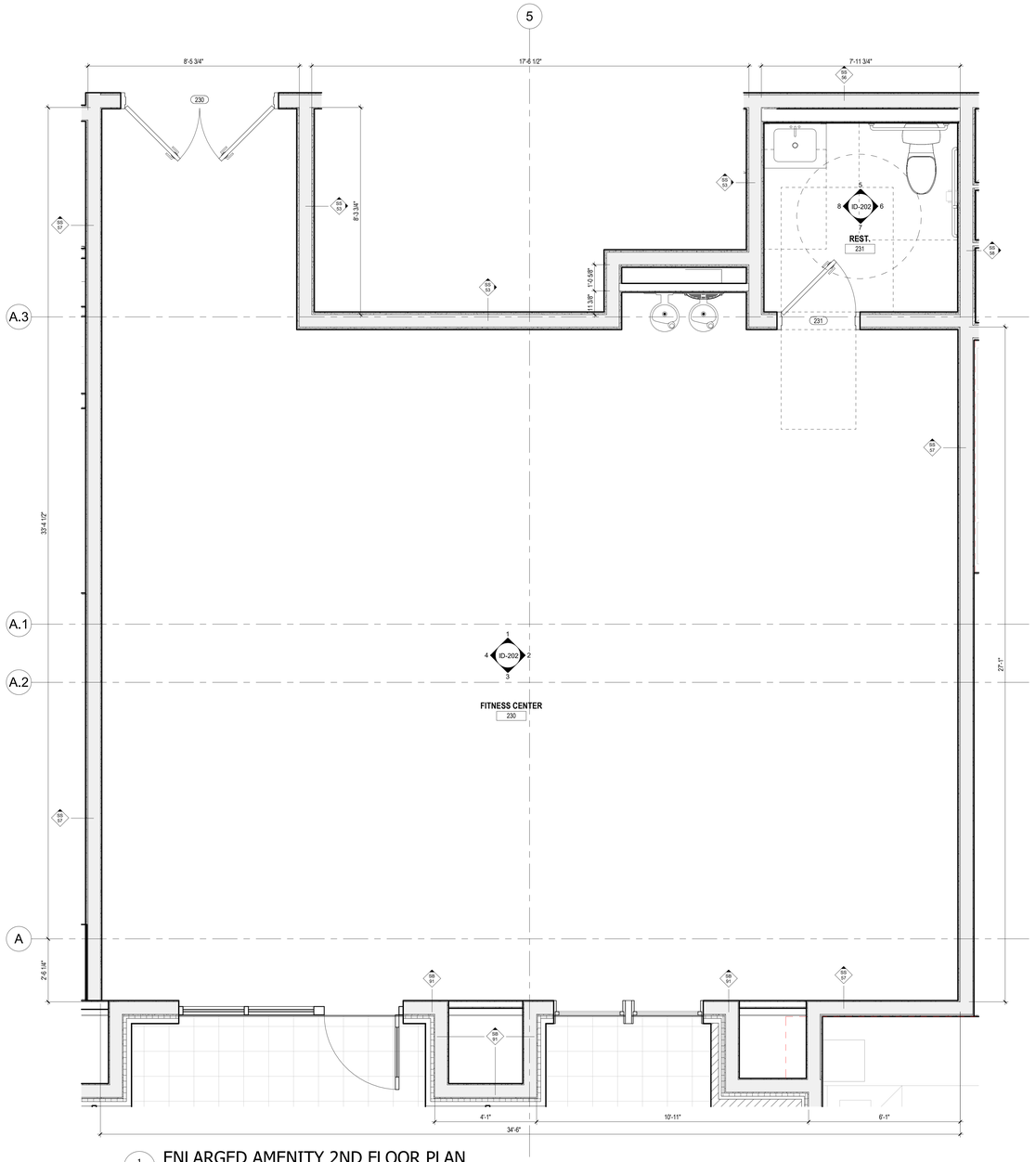
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2 ID-201 ENLARGED R1 AMENITY RCP PLAN
Scale: 1/2" = 1'-0"



1 ID-201 ENLARGED AMENITY 2ND FLOOR PLAN
Scale: 1/2" = 1'-0"

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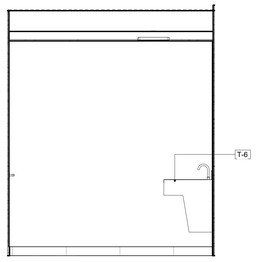
FITNESS CENTER - ENLARGED FLOOR PLAN & RCP

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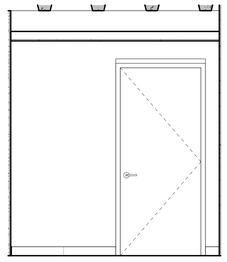
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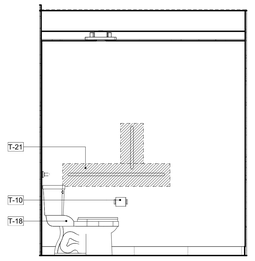
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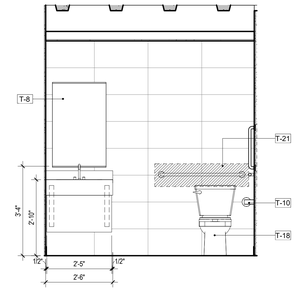
8 ID-202 FITNESS CENTER RESTROOM 4
Scale: 1/2" = 1'-0"



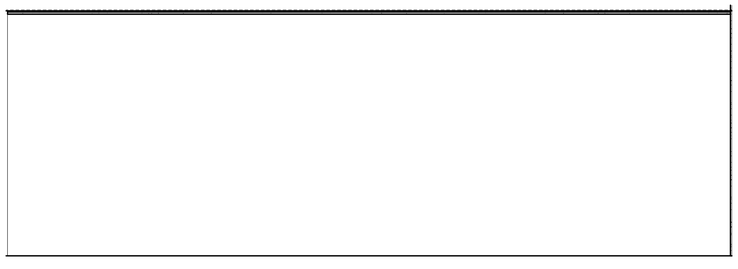
7 ID-202 FITNESS CENTER RESTROOM 3
Scale: 1/2" = 1'-0"



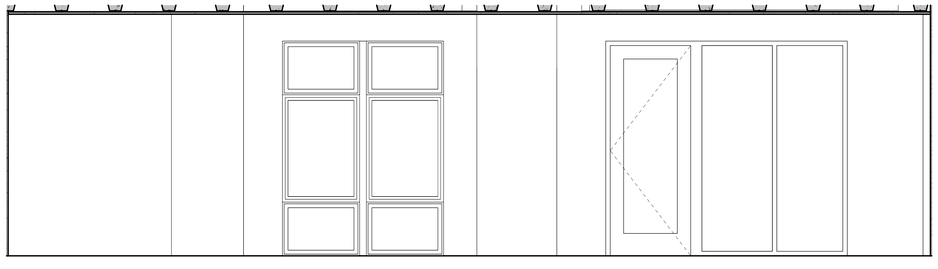
6 ID-202 FITNESS CENTER RESTROOM 2
Scale: 1/2" = 1'-0"



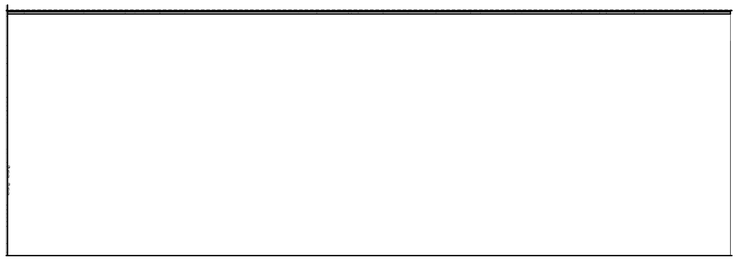
5 ID-202 FITNESS CENTER RESTROOM 1
Scale: 1/2" = 1'-0"



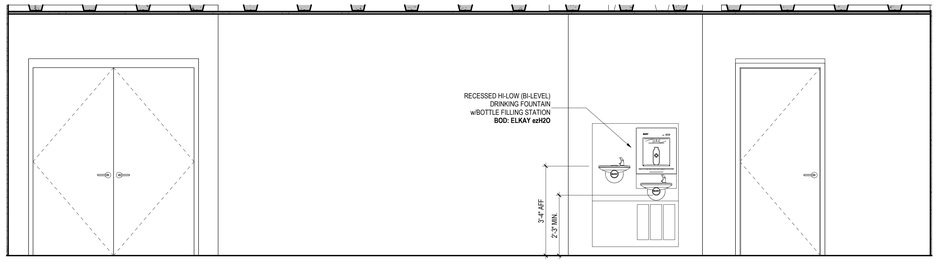
4 ID-202 FITNESS CENTER ELEVATION
Scale: 1/2" = 1'-0"



3 ID-202 FITNESS CENTER ELEVATION
Scale: 1/2" = 1'-0"



2 ID-202 FITNESS CENTER ELEVATION
Scale: 1/2" = 1'-0"



1 ID-202 FITNESS CENTER ELEVATION
Scale: 1/2" = 1'-0"

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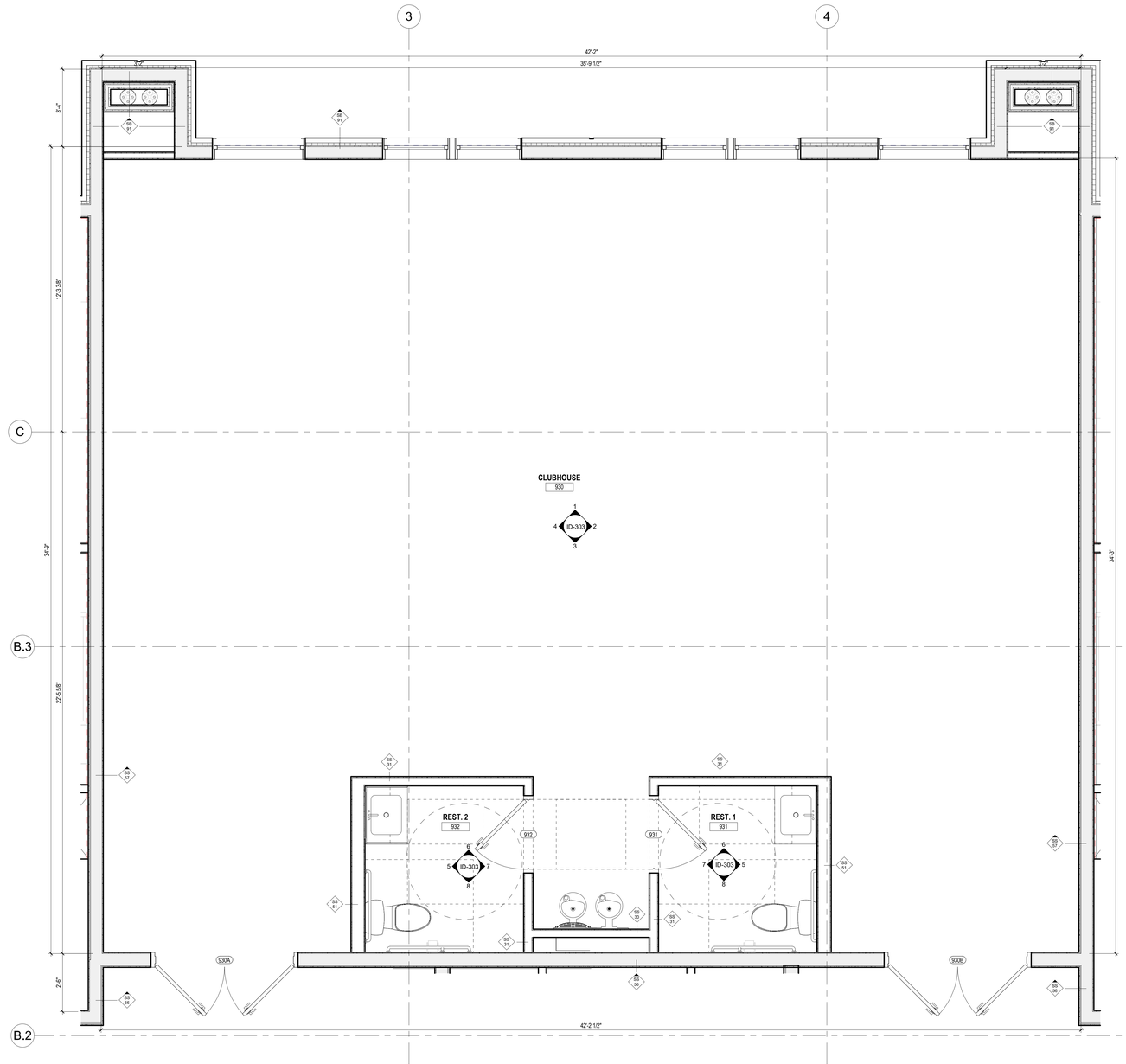
FITNESS CENTER - INTERIOR ELEVATIONS

NO.	DESCRIPTION	DATE
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1 ID-301 ENLARGED AMENITY 9TH FLOOR PLAN
Scale: 1/2" = 1'-0"

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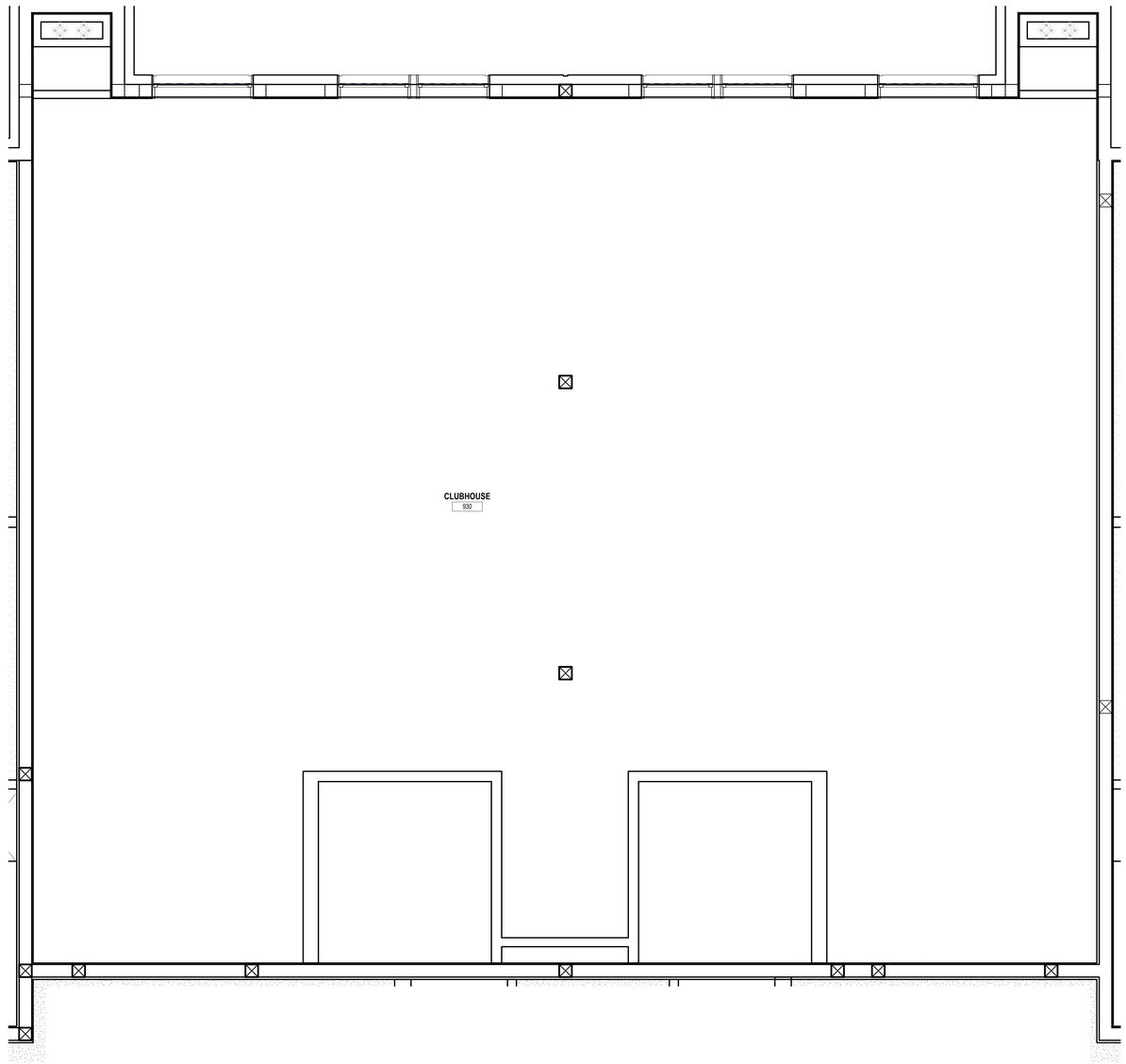
CLUB HOUSE - ENLARGED FLOOR PLAN

NO.	DESCRIPTION	DATE
	100% DD SUBMISSION	01/31/25
	25% DD SUBMISSION	12/13/24

PROJECT No: SKG.0028
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1 ID-302 ENLARGED AMENITY 9TH RCP PLAN
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CLUB HOUSE - ENLARGED RCP

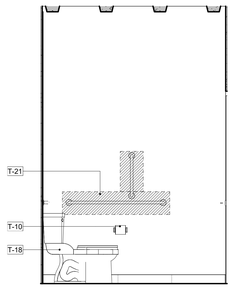
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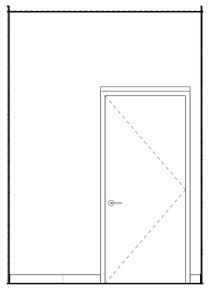
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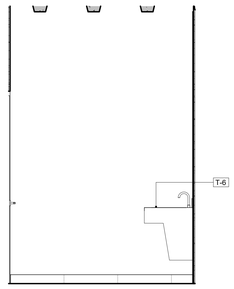
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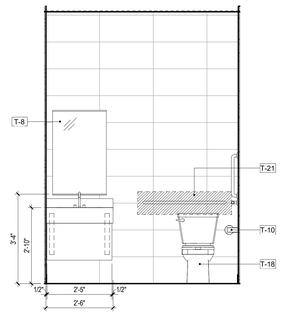
8 ID-303 CLUB HOUSE RESTROOM 4
Scale: 1/2" = 1'-0"



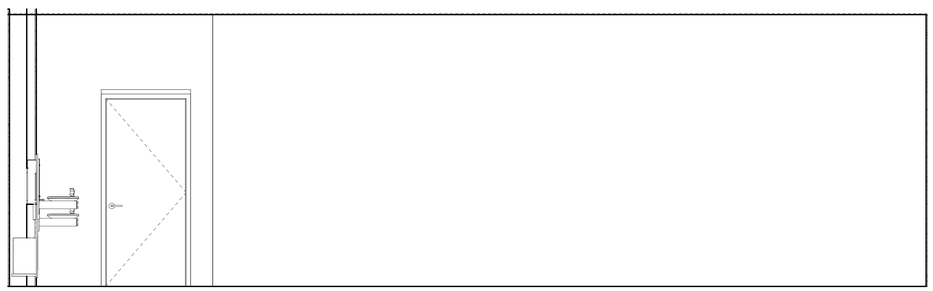
7 ID-303 CLUB HOUSE RESTROOM 3
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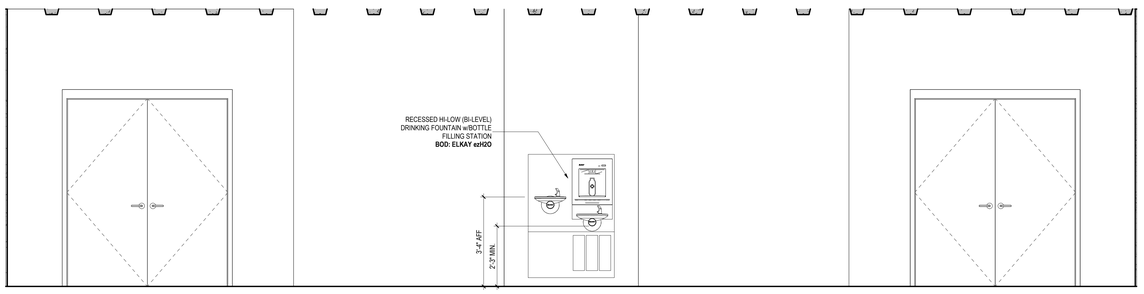
6 ID-303 CLUB HOUSE RESTROOM 2
Scale: 1/2" = 1'-0"



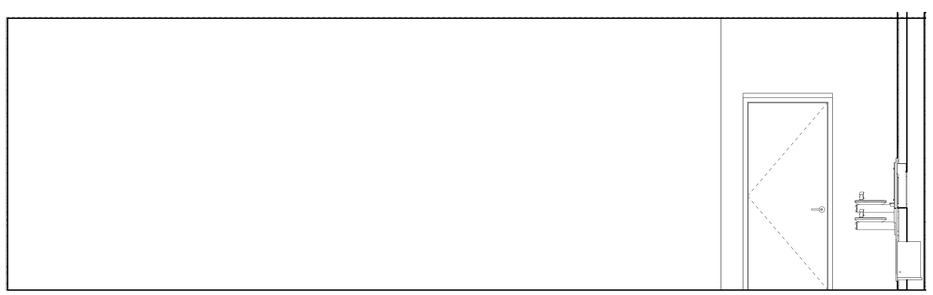
5 ID-303 CLUB HOUSE RESTROOM 1
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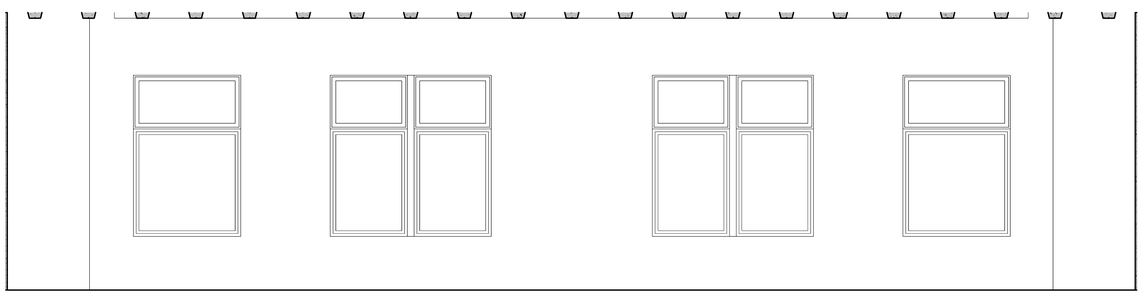
4 ID-303 CLUBHOUSE ELEVATION
Scale: 1/2" = 1'-0"



3 ID-303 CLUBHOUSE ELEVATION
Scale: 1/2" = 1'-0"



2 ID-303 CLUBHOUSE ELEVATION
Scale: 1/2" = 1'-0"



1 ID-303 CLUBHOUSE ELEVATION
Scale: 1/2" = 1'-0"

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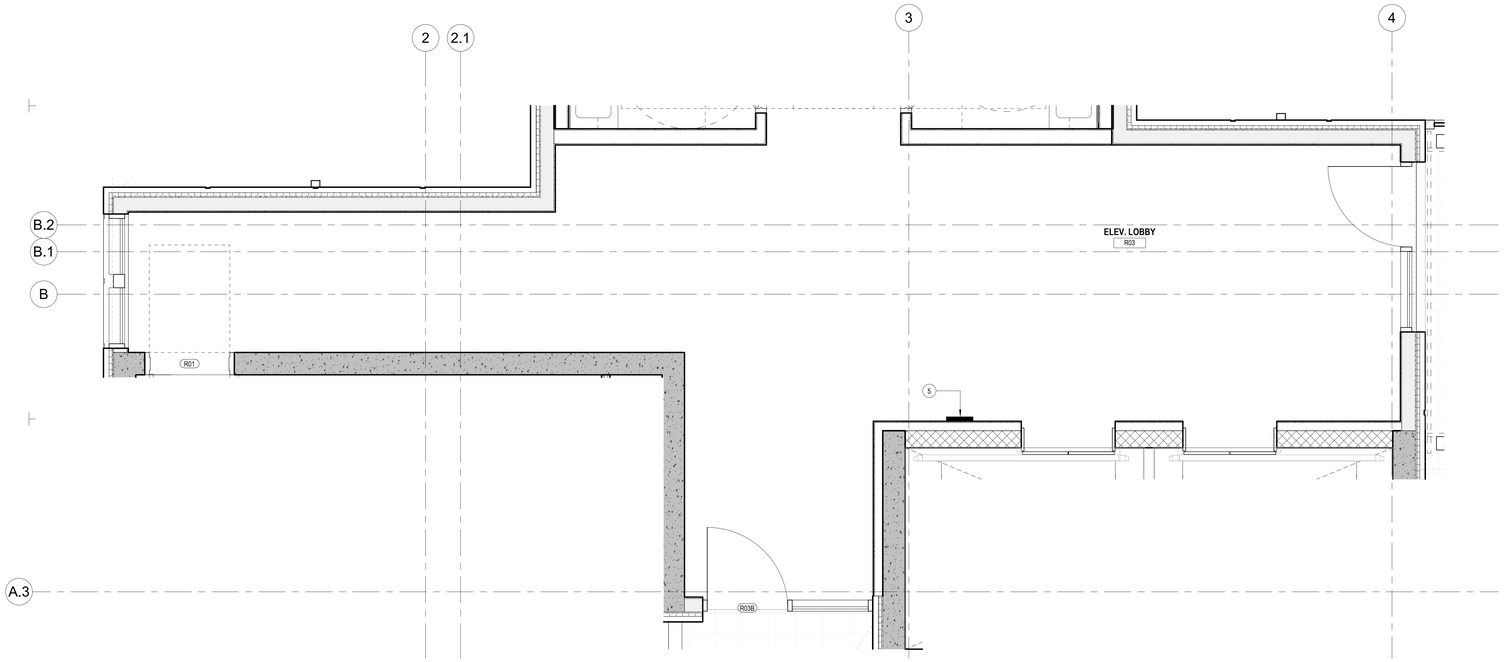
CLUB HOUSE - INTERIOR ELEVATIONS

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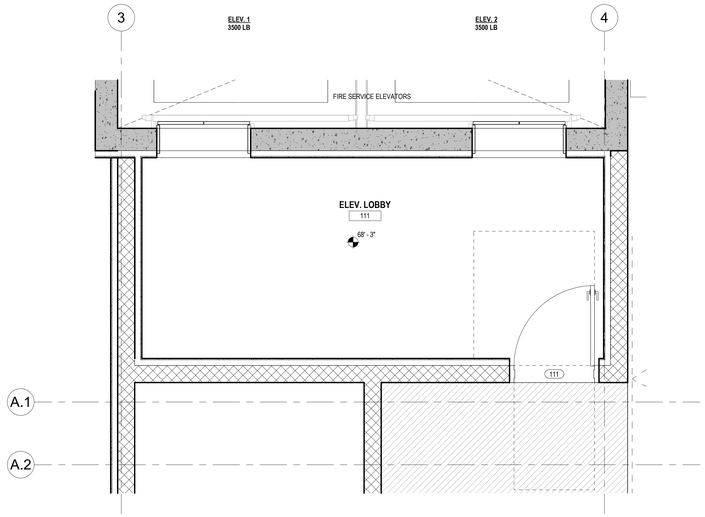
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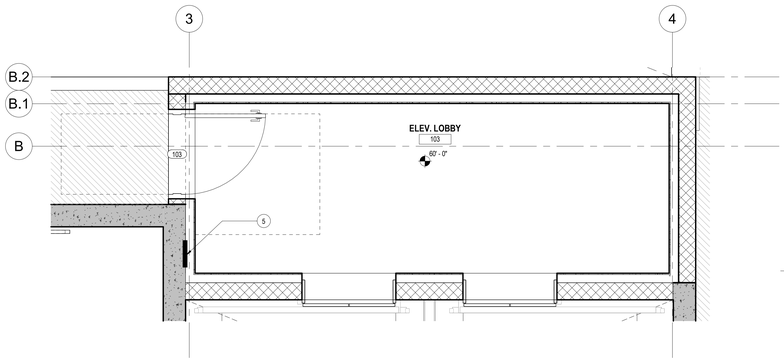
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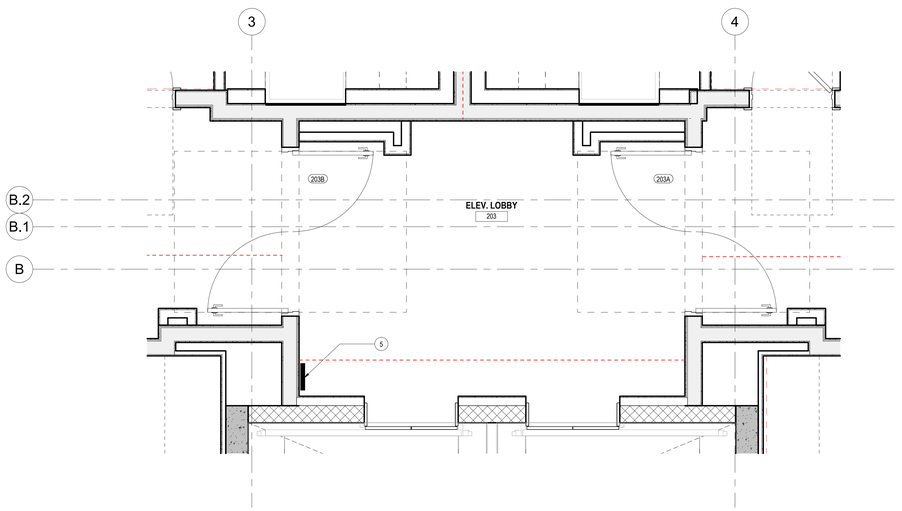
4 ID-401 ELEV. LOBBY_BUILDING ROOF FLOOR PLAN
Scale: 1/2" = 1'-0"



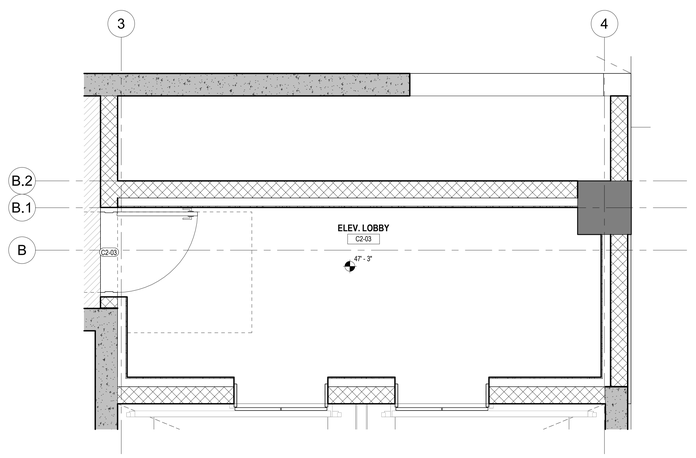
2 ID-401 ELEV. LOBBY_@ 68'-3" FLOOR PLAN
Scale: 1/2" = 1'-0"



6 ID-401 ELEV. LOBBY_1ST FLOOR PLAN
Scale: 1/2" = 1'-0"



3 ID-401 ELEV. LOBBY_2ND TO 9TH FLOOR PLAN
Scale: 1/2" = 1'-0"



1 ID-401 ELEV. LOBBY_CELLAR 2 FLOOR PLAN
Scale: 1/2" = 1'-0"

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ELEV. LOBBY - ENLARGED FLOOR PLAN

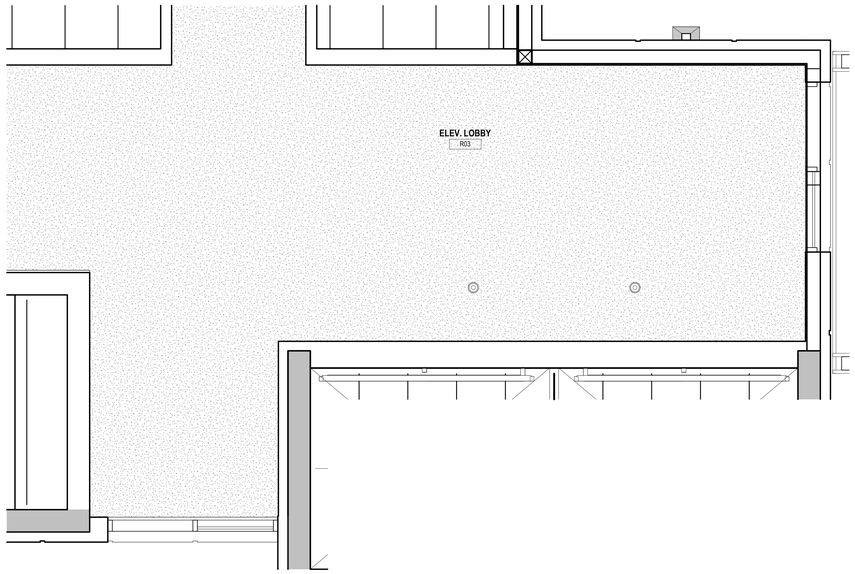
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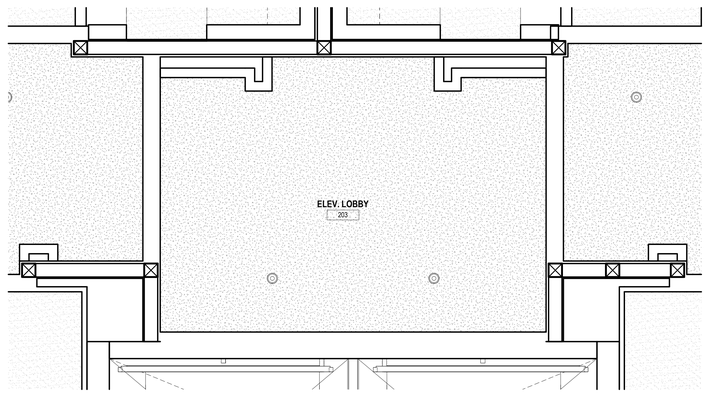
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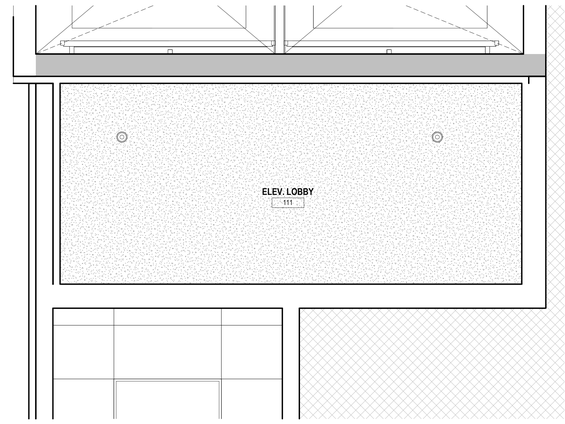
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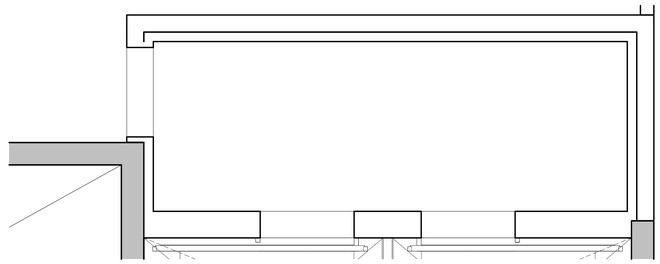
5 ID-402 ELEV. LOBBY_BUILDING ROOF RCP PLAN
Scale: 1/2" = 1'-0"



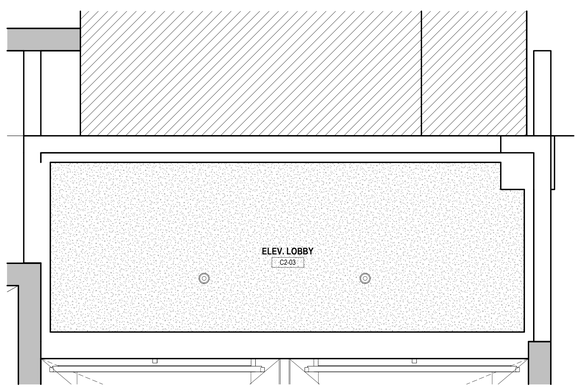
4 ID-402 ELEV. LOBBY_2ND TO 9TH RCP PLAN
Scale: 1/2" = 1'-0"



3 ID-402 ELEV. LOBBY_@ 68'-3" RCP PLAN
Scale: 1/2" = 1'-0"



2 ID-402 ELEV. LOBBY_1ST RCP PLAN
Scale: 1/2" = 1'-0"



1 ID-402 ELEV. LOBBY_CELLAR 2 RCP PLAN
Scale: 1/2" = 1'-0"

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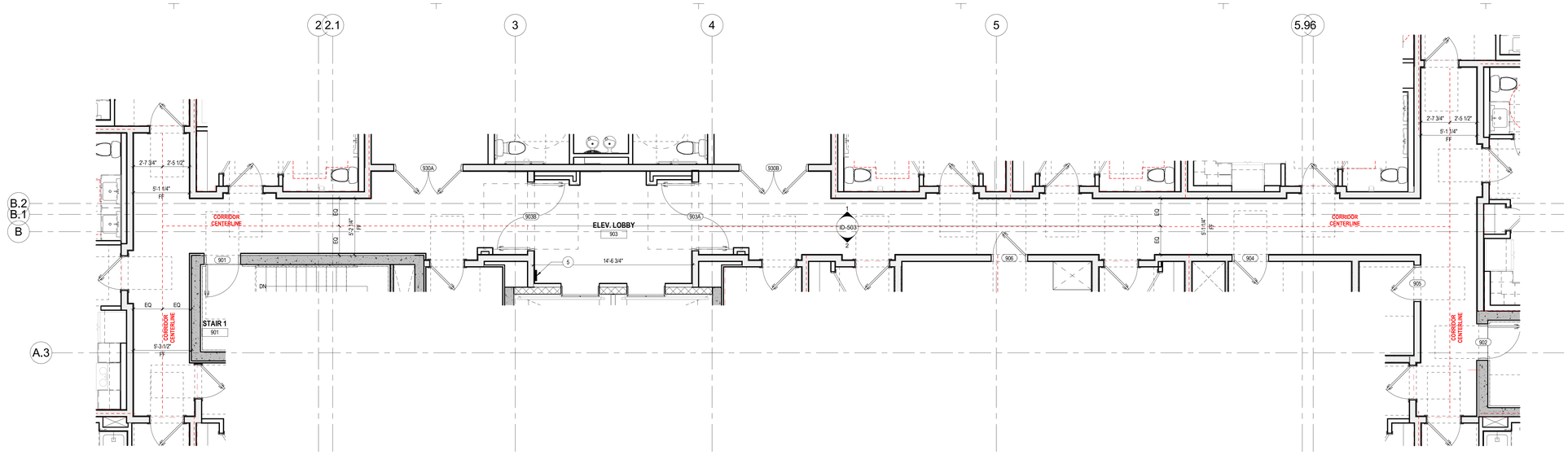
ELEV. LOBBY - ENLARGED RCP PLAN

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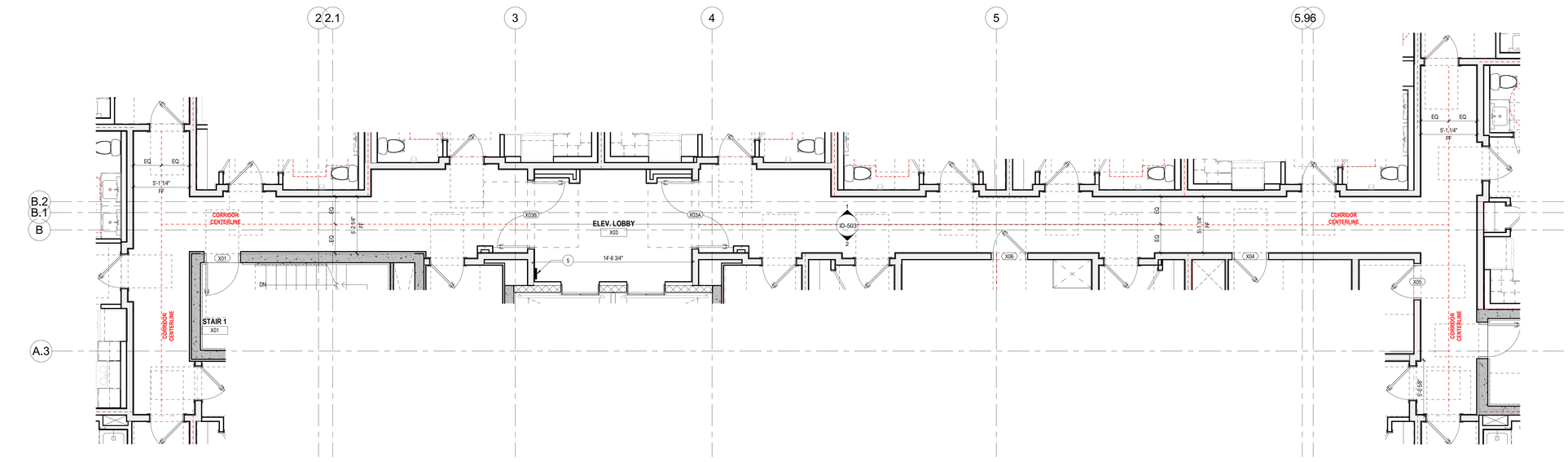
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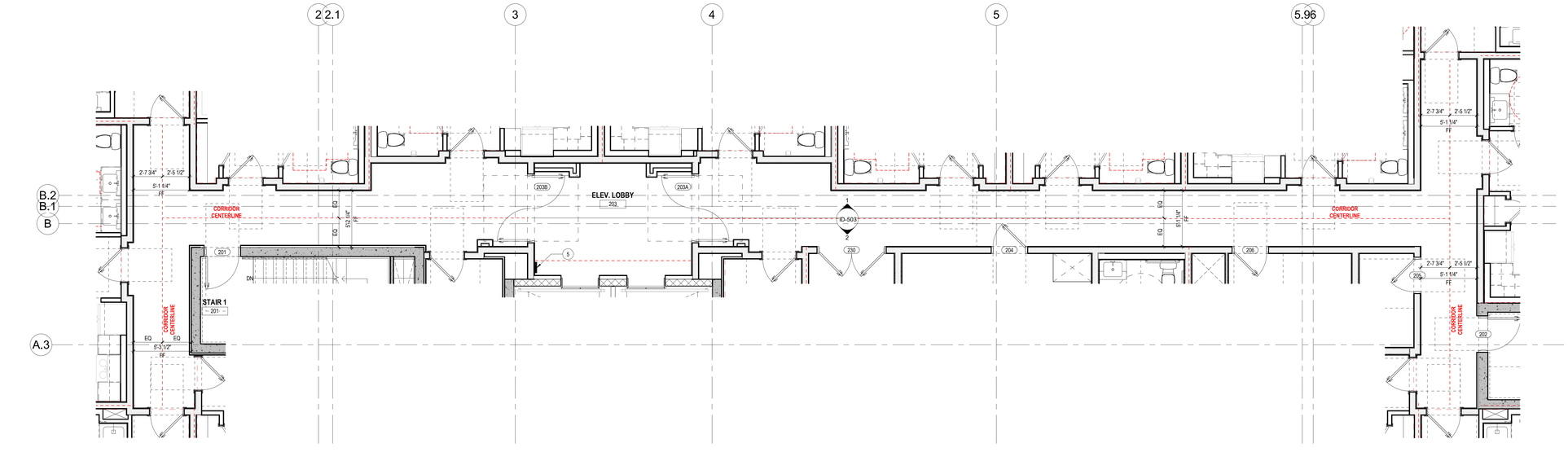
3 ID-501 9TH FLOOR PLAN

Scale: 1/4" = 1'-0"



2 ID-501 TYPICAL (3RD-8TH) FLOOR PLAN

Scale: 1/4" = 1'-0"



1 ID-501 2ND FLOOR PLAN

Scale: 1/4" = 1'-0"

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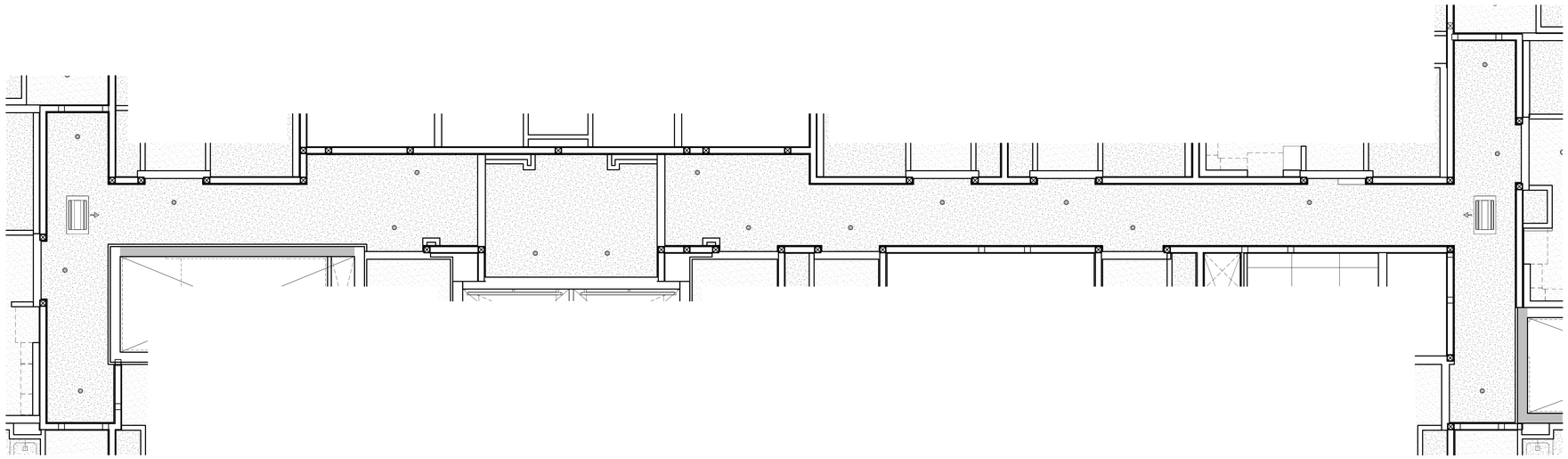
CORRIDOR - ENLARGED FLOOR PLAN

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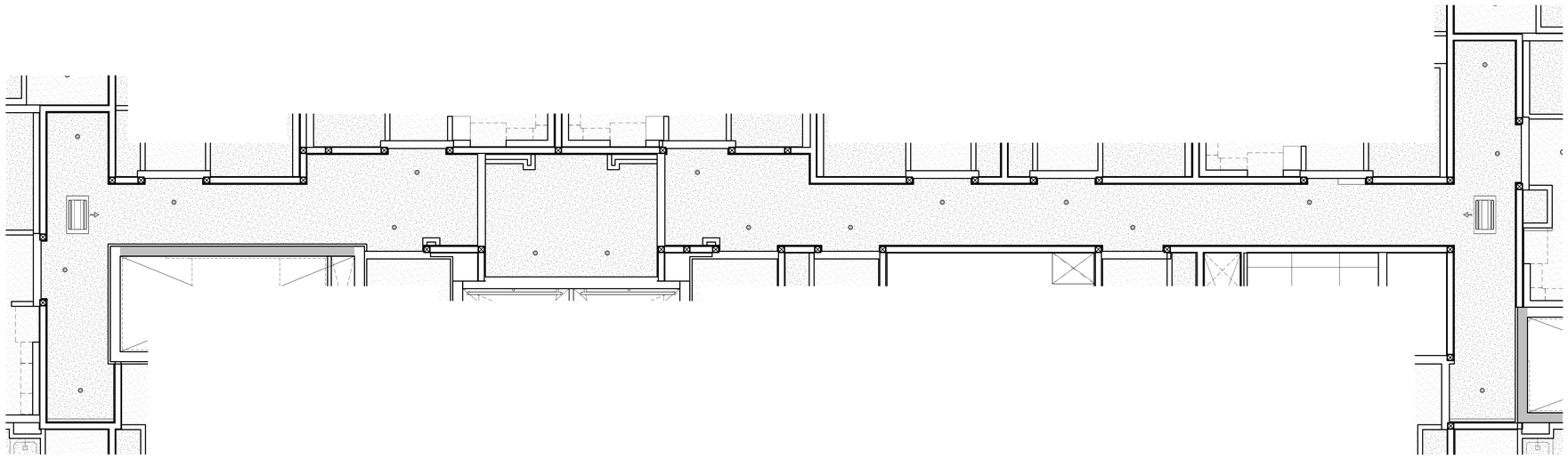
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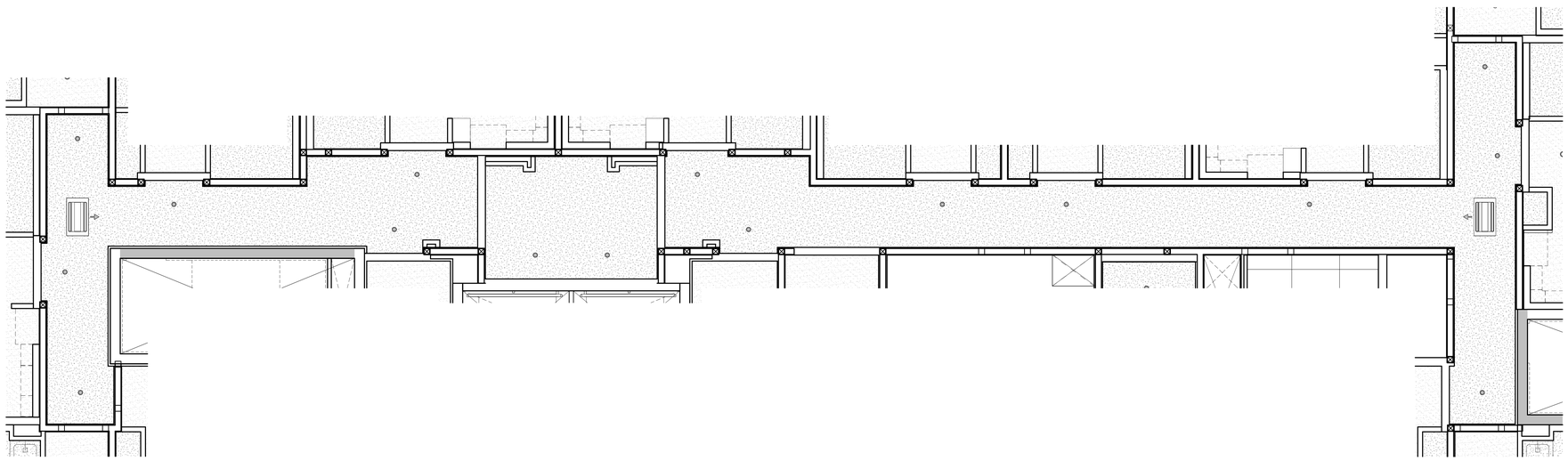
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3 ID-502 CORRIDOR_9TH RCP PLAN
Scale: 1/4" = 1'-0"



2 ID-502 CORRIDOR_TYPICAL RCP PLAN
Scale: 1/4" = 1'-0"



1 ID-502 CORRIDOR_2ND RCP PLAN
Scale: 1/4" = 1'-0"

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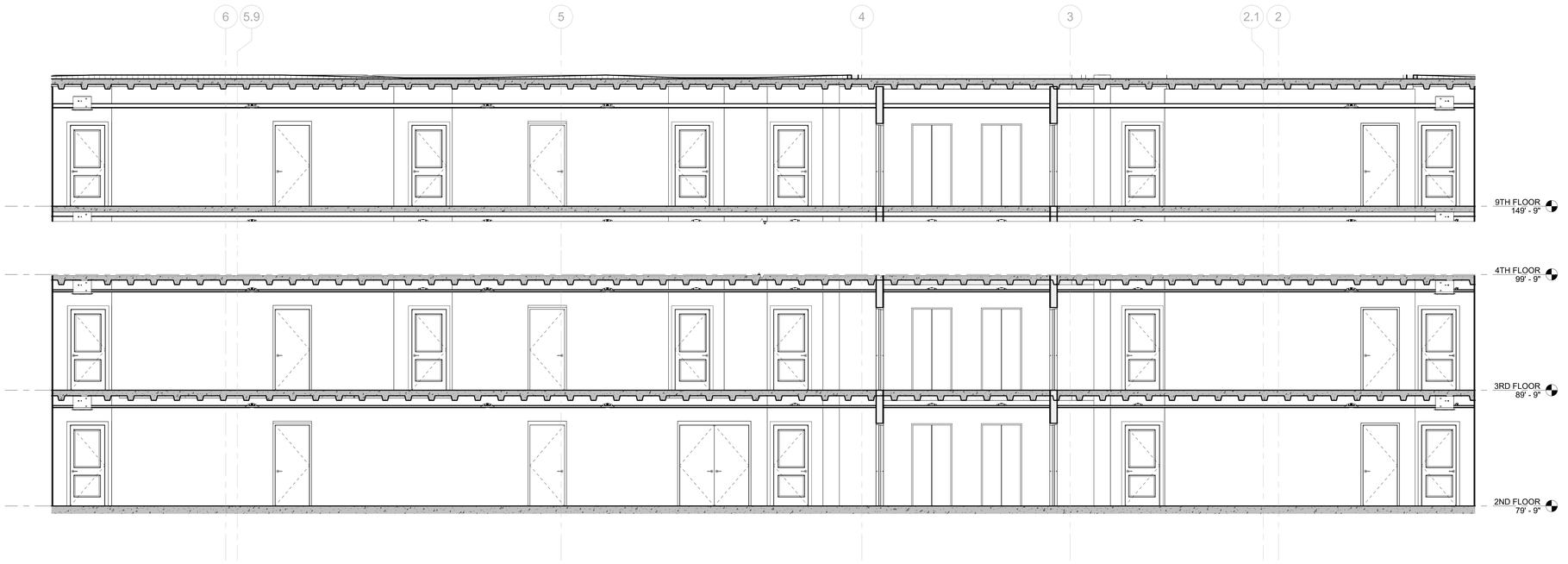
CORRIDOR - ENLARGED RCP PLAN

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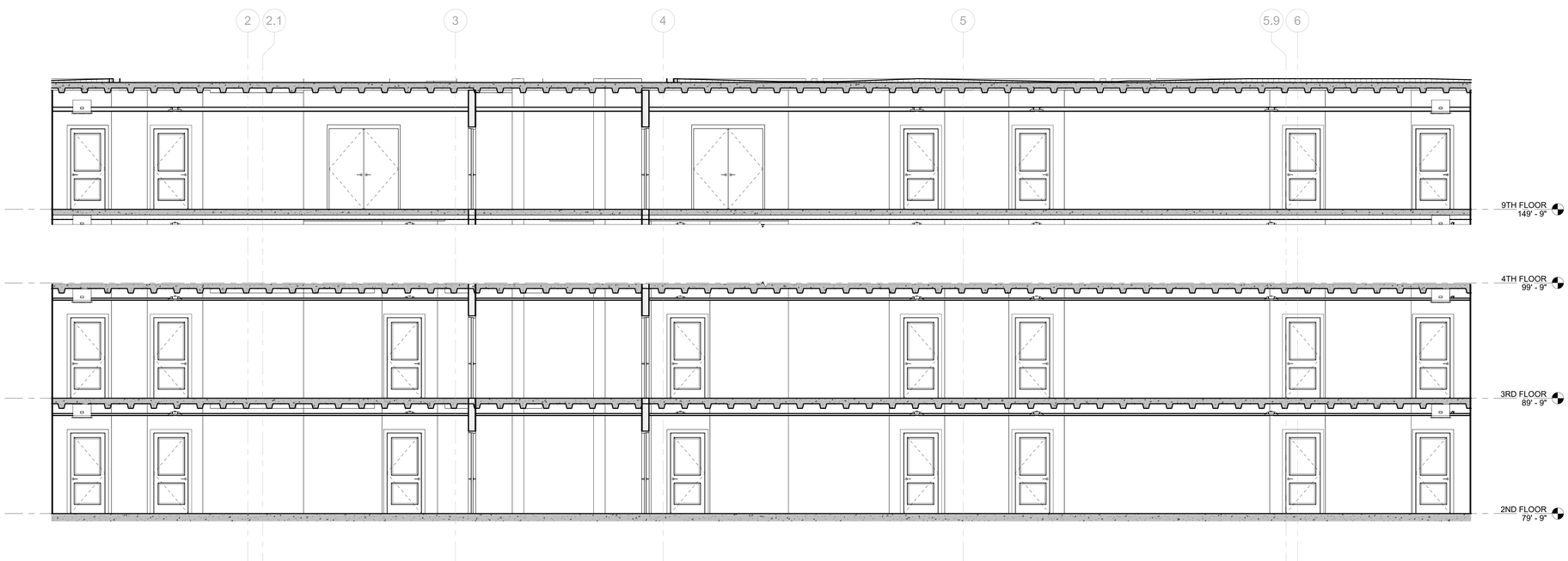
ID-502

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2 ID-503 CORRIDOR ELEVATION 02

Scale: 1/4" = 1'-0"



1 ID-503 CORRIDOR ELEVATION 01

Scale: 1/4" = 1'-0"

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CORRIDOR - INTERIOR ELEVATIONS

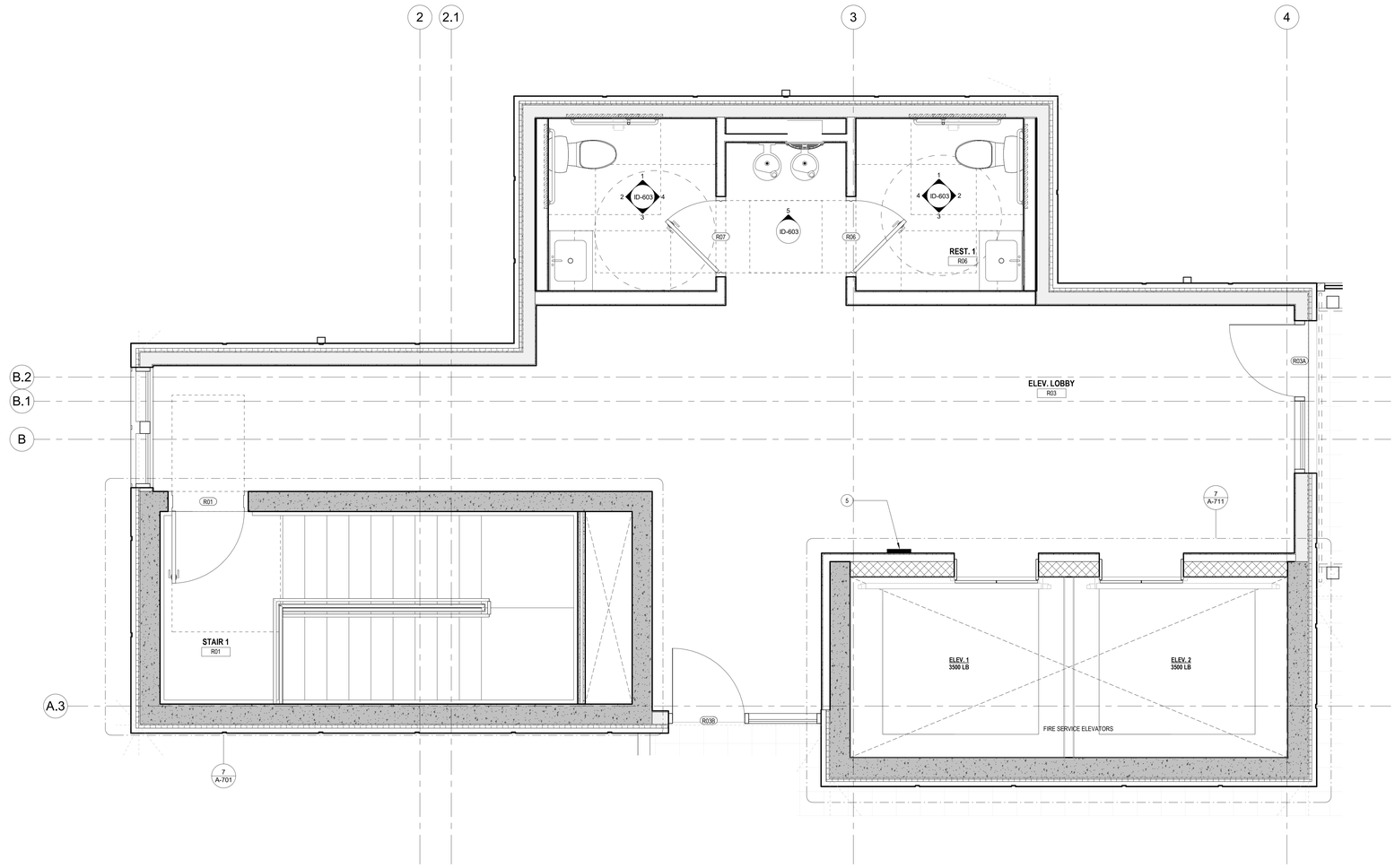
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1 ID-601 MECH. / GEN. / STAIR ACC. / RESTROOM FLOOR PLAN
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MECH. / GEN. / STAIR ACC. / REST. - ENLARGED FLOOR

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ID-601

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1 ID-602 MECH. / GEN. / STAIR ACC. / RESTROOM RCP PLAN
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MECH. / GEN. / STAIR ACC. / REST. - ENLARGED RCP PLAN

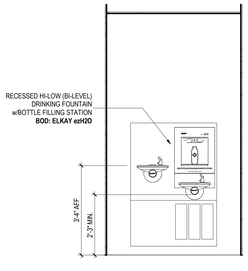
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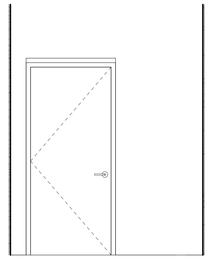
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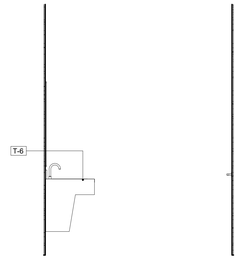
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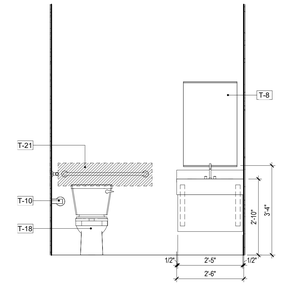
5 ID-603 PENTHOUSE RESTROOM 5
Scale: 1/2" = 1'-0"



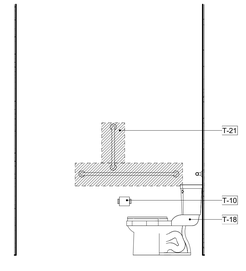
4 ID-603 PENTHOUSE RESTROOM 4
Scale: 1/2" = 1'-0"



3 ID-603 PENTHOUSE RESTROOM 3
Scale: 1/2" = 1'-0"



2 ID-603 PENTHOUSE RESTROOM 2
Scale: 1/2" = 1'-0"



1 ID-603 PENTHOUSE RESTROOM 1
Scale: 1/2" = 1'-0"

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MECH. / GEN. / STAIR ACC. / REST. - INTERIOR ELEVATION

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FILE NAME:

ID-603

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Appendix B:

Fish and Wildlife Resources Impact Analysis Decision Key

Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key		If YES Go to:	If NO Go to:
1.	Is the site or area of concern a discharge or spill event?	13	2
2.	Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3
3.	Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9
4.	Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5
5.	Has the contamination gone off-site?	6	14
6.	Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14
7.	Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8
8.	Does contamination exist at concentrations that could exceed ecological impact SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14
9.	Does the site or any adjacent or downgradient property contain any of the following resources? i. Any endangered, threatened or special concern species or rare plants or their habitat ii. Any DEC designated significant habitats or rare NYS Ecological Communities iii. Tidal or freshwater wetlands iv. Stream, creek or river v. Pond, lake, lagoon vi. Drainage ditch or channel vii. Other surface water feature viii. Other marine or freshwater habitat ix. Forest x. Grassland or grassy field xi. Parkland or woodland xii. Shrubby area xiii. Urban wildlife habitat xiv. Other terrestrial habitat	11	10
10.	Is the lack of resources due to the contamination?	3.10.1	14
11.	Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12
12.	Does the site have widespread surface soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	12
13.	Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact DEC for information regarding endangered species.)	Section 3.10.1	14
14.	No Fish and Wildlife Resources Impact Analysis needed.		

Appendix C:
Citizen Participation Plan

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
28-34 Pearl Street

October 2021

BCP Site No. C360214
28-34 Pearl Street
Westchester County
Port Chester, New York 10573

Contents

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* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **28 Pearl Street Development LLC**
Site Name: **28-34 Pearl Street**
Site Address: **28-34 Pearl Street**
Site County: **Westchester**
Site Number: **C360214**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The

flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.

Citizen Participation Activities	Timing of CP Activity(ies)
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

There will be areas on the Site where soil excavation is necessary. Therefore, once the remediation commences, there may be concerns regarding dust, odors, noise or truck traffic coming from the Site. However, these impacts will be mitigated through implementation of a Health and Safety Plan and Soil Management Plan approved by the Department, which will be designed to minimize these impacts. A Community Air Monitoring Plan will also be implemented to monitor dust and vapors to ensure the community is not impacted. CAMP implementation involves the placement of air monitoring stations upwind and downwind of where work is occurring to capture both dust and vapor emissions. If dust or emissions exceed a set threshold established by DEC and the Department of Health, then work must cease and the cause of the issue must be corrected before work can proceed.

The site is located in an Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The site includes a largely Hispanic-American and African-American population. Therefore, all future fact sheets will be translated into Spanish.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- **Location – 28-34 Pearl Street, Port Chester, NY, Westchester County**
- **Setting - Suburban**
- **Site size – 28 Pearl Street, .33 Acres; 34 Pearl Street, .12 Acres**
- **Adjacent properties – Residential, Commercial, Industrial**

History of Site Use, Investigation, and Cleanup

Prior to the current uses on the Site, part of the Site was used as a fueling station. Six 2,000-gallon underground storage tanks were removed from the Site when the use was converted from a fueling station to its present use. Historical USGS maps indicate that the buildings on the Site were constructed during or prior to the 1940s.

The Site currently consists of a two-story three-bedroom home and commercial storefronts (small engine and auto repair). A small engine repair shop, Joe's Garage, and auto repair shop, V &G Int' l Transmissions & Auto Repair, LTD., occupy the single-story building at 28 Pearl Street. 28 Pearl Street also consists of a paved parking area located in front of the building along Pearl Street.

A subsurface investigation of the site was performed in August 2020 which investigated soil, groundwater and soil vapor at the site. The investigation revealed that petroleum-related volatile organic compounds and metals have impacted soil, groundwater and soil vapor at the site at levels requiring remediation.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted residential purposes.

To achieve this goal, the Applicant will conduct Investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The

Applicant has developed a remedial investigation workplan, which was subject to public comment with the application.

The site investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and the environment; and
4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submitted a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC made the draft plan available to the public review during a 30-day public comment period. The investigation will begin in March 2022.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for

public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the

remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Michael Squire
Project Manager
NYS Dept. of Environmental Conservation
625 Broadway
Albany, NY 12233-7014
Michael.squire@dec.ny.gov

New York State Department of Health (NYSDOH):

Christopher Budd
Project Manager
NYSDOH
Empire State Plaza
Corning Tower Room 1787
Albany, NY 12237
beei@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Port Chester-Rye Brook Public Library
Robin Lettieri, Director
1 Hasco Avenue
Port Chester, 10573

Hours:

Mon	9a-9p
Tues-Fri	9a-5p
Saturday	9a-12p
Sunday	Closed

Appendix B - Site Contact List

Federal and State Officials		
Charles Schumer U.S. Senator 780 Third Avenue, Suite 2301 New York, NY 10017	Kirsten Gillibrand U.S. Senator Leo W. O'Brien Federal Office Building 11A Clinton Ave., Rm 821 Albany, NY 12207	Kisha Santiago-Martinez NYS Dept. State - Office of Planning and Development One Commerce Plaza, 99 Washington Ave, Suite 1010 Albany, NY 12231
Michael Lawyer U.S. House of Representatives, 17th District One Blue Hill Plaza, 3rd FL Pearl River, NY 10965	Shelley B. Mayer New York State Senator, 37th District 235 Mamaroneck Ave, Suite 400 White Plains, NY 10605	Steven Otis NYS Assembly Member, District 91 222 Grace Church Street Port Chester, NY 10573
Ken Jenkins Westchester County Executive 148 Martine Avenue White Plains, NY 10601	Bernard Thombs Westchester County Planning Board, Chair 148 Martine Avenue White Plains, NY 10601	Luis A. Marino Mayor of Port Chester 222 Grace Church Street, Suite 105 Port Chester, NY 10573
Michael Scarola Port Chester Planning Commission 222 Grace Church Street, Suite 202 Port Chester, NY 10573	Stuart L. Rabin Village Manager, Village Board of Trustees 222 Grace Church Street Port Chester, NY 10573	Gina Olaya Village Building Department, Senior Office Assistant 222 Grace Church Street Port Chester, NY 10573
Media Outlets		
The Journal News 1133 Westchester Avenue, Suite N110 White Plains, NY 10604	Westmore News 38 Broad Street Port Chester, NY 10573	New York Daily News 4 New York Plaza New York, NY 10004
New York Post 1211 Avenue of the Americas New York, NY 10036		

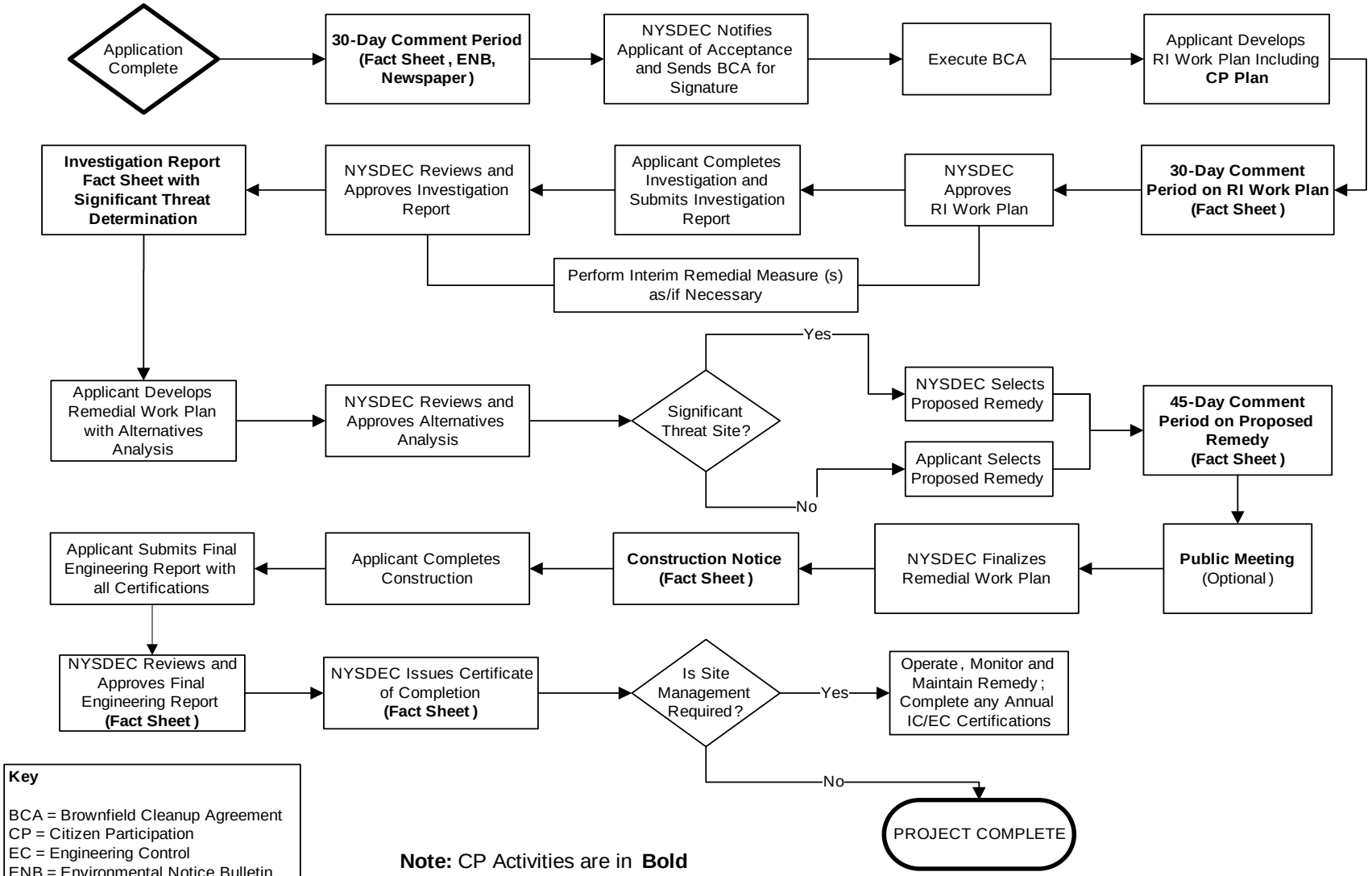
Public Water Supplier		
SUEZ Westchester Operations 2525 Palmer Avenue New Rochelle, NY 10801		
Schools and Daycare Centers		
Judy Diaz John F. Kennedy Elementary School, Principal 40 Olivia Street Port Chester, NY 10573	Deirdre McDermott Corpus Christi-Holy Rosary School, Principal 135 South Regent Street Port Chester, NY 10573	Paola G. Monsalve Port Chester Head Start, Provider 17 Spring Street Port Chester, NY 10573
Paola Pajares Sunny Side Daycare Center, Program Director 27 Smith Street Port Chester, NY 10573	Marcela Arismendi Ladybug Family Preschool, Program Director 141 William Street Port Chester, NY 10573	Rosa Delgado Rossy's Little Angels Family Daycare 43 Soundview Street Port Chester, NY 10573
Adjacent Property Owners		
Nerikids, LLC Adjacent Property Owner of 38 Pearl Street, 42 Pearl Street, and 45 Smith Street 31 Pearl Street Port Chester, NY 10573	40 Pearl Street Inc. Adjacent Property Owner of 40 Pearl Street and 31 Pearl Street 31-37 Pearl Street Port Chester, NY 10573	1030 East 174th Street LLC Adjacent Property Owner of 50 Pearl Street 26 Lowell Road New Rochelle, NY 10573
Christopher Numme Adjacent Property Owner of 60 Pearl Street 60 Pearl Street Port Chester, NY 10573	Ester Vermong Adjacent Property Owner/Operator of 43 Smith Street 43 Smith Street Port Chester, NY 10573	Wilmer and Lillian Gonzalez Adjacent Property Owner/Operator of 37 Smith Street 37 Smith Street Port Chester, NY 10573
Anthony R. Trione Adjacent Property Owner/Operator of 33 Smith Street 33 Smith Street Port Chester, NY 10573	Jorge Pajares Adjacent Property Owner/Operator of 27 Smith Street 27 Smith Street Port Chester, NY 10573	10 South Pearl St LLC Adjacent Property Owner of 10 Pearl Street 40 Pearl Street Port Chester, NY 10573
11 South Pearl Street LLC Adjacent Property Owner of 11 Pearl Street 31 Pearl Street Port Chester, NY 10573	15 South Pearl St Parking LLC Adjacent Property Owner of Pearl Street 40 Pearl Street	Neri's Land Improvement LLC Adjacent Property Owner of 41 Pearl Street 31 Pearl Street

	Port Chester, NY 10573	Port Chester, NY 10573
Church of The Living God Inc. Adjacent Property Owner of 9 New Broad Street 5 New Broad Street Port Chester, NY 10573	29 New Broad St Realty Corp Adjacent Property Owner of 29 New Broad Street 29 New Broad Street Port Chester, NY 10573	Neri's Bakery Products Adjacent Property Operator of 31 Pearl Street 31 Pearl Street Port Chester, NY 10573
T&J Restaurant & Pizzeria Adjacent Property Operator of 10 Pearl Street 10 Pearl Street Port Chester, NY 10573	Island Park Auto Body Adjacent Property Operator of 29 New Board Street 29 New Broad Street Port Chester, NY 10573	Ace Lawnmower & Tractor Sale Adjacent Property Operator of 28 Pearl Street 28 Pearl Street Port Chester, NY 10573
Executive Motor Imports, Inc Adjacent Property Operator of 60 Pearl Street 60 Pearl Street Port Chester, NY 10573	Numme Auto Body & Fender Repair Adjacent Property Operator of 60 Pearl Street 60 Pearl Street Port Chester, NY 10573	

Appendix C - Site Location Map



Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern (see instructions)

Site Name: 28-34 Pearl Street

Site Number: C360214

Site Address and County: 28-34 Pearl Street, Port Chester, NY

Remedial Party(ies): 28 Pearl Street Development LLC

Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
The list of concern concerns are typical impacts that may result in a remediation project.

How were these issues and/or information needs identified?
See response above

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
Nothing is needed from the community at this time.

How were these information needs identified?
NA

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
Each step in the BCP process is communicated to the public via fact sheets so the public will understand what is happening at the site.

How were these issues and/or information needs identified?
This is the standard public communication process in the BCP.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☒ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☒ **Industrial**

b. Residential type around site:
☐ **Urban** ☒ **Suburban** ☐ **Rural**

c. Population density around site:

☒ **High** ☐ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

h. Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
Large Hispanic community. All future fact sheets will be translated into Spanish.

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☐ **Local Officials:** Click here to enter text.

☐ **Media:** Click here to enter text.

☐ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☐ **Citizens/Community Group(s):** Click here to enter text.

☐ **Environmental Justice Group(s):** Click here to enter text.

☐ **Environmental Group(s):** Click here to enter text.

☐ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Prepared/Updated By: Linda R. Shaw, Esq. **Date:** 10/9/2021

Reviewed Approved By: Click here to enter text. **Date:** Click here to enter text.

Appendix D:

Health and Safety Plan

SESI
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Geotechnical
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Health and Safety Plan

For:

28-34 Pearl Street Site
28-34 Pearl Street
Port Chester, New York
NYSDEC BCP Site # C360214

Prepared for:

28 Pearl Street Development LLC

c/o Six Acre Capital

SESI Project No:
12123A

Date:
April 2026

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

28-34 Pearl Street
Port Chester, New York
NYSDEC BCP Site # C360214

Prepared by: _____ Date: TBD

_____

MaryKate Chorazak
SESI-Assistant Project Manager

Approved by: _____ Date: TBD

_____

Fuad Dahan. P.E., PhD.
SESI-Principal

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Disclaimer: This Health and Safety Plan (HASP) is based upon information provided [and, if applicable, conditions discovered during a site visit], and is limited by the project scope.

The HASP should be periodically reviewed and updated based on a number of factors, including but not limited to: (1) changes in applicable governmental requirements; (2) changes in procedures at the site; and (3) site conditions which were unknown to SESI Consulting Engineers (SESI) as of the time the HASP was prepared.

This HASP has been prepared for the sole and exclusive use of Client listed above, and may not be relied upon by any other person without the express written consent and authorization of SESI.

LIST OF ACRONYMS

Acronym	Definition
ACGIH	American Conference of Governmental Industrial Hygienists
COC	Contaminants(s) of Concern
CRZ	Contamination Reduction Zone
EMS	Emergency Medical Services
EZ	Exclusion Zone
FS	Field Supervisor
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PFD	Personal Flotation Device
PID	Photoionization Detector
PM	Project Manager
PO	Project Officer
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
RI	Remedial Investigation
SESI	SESI Consulting Engineers
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
SZ	Support Zone
TLV	Threshold Limit Value
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 OBJECTIVE

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during activities at 28–34 Pearl Street, Port Chester, New York (the Site). The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of injury, illness, or other hazardous incidents.

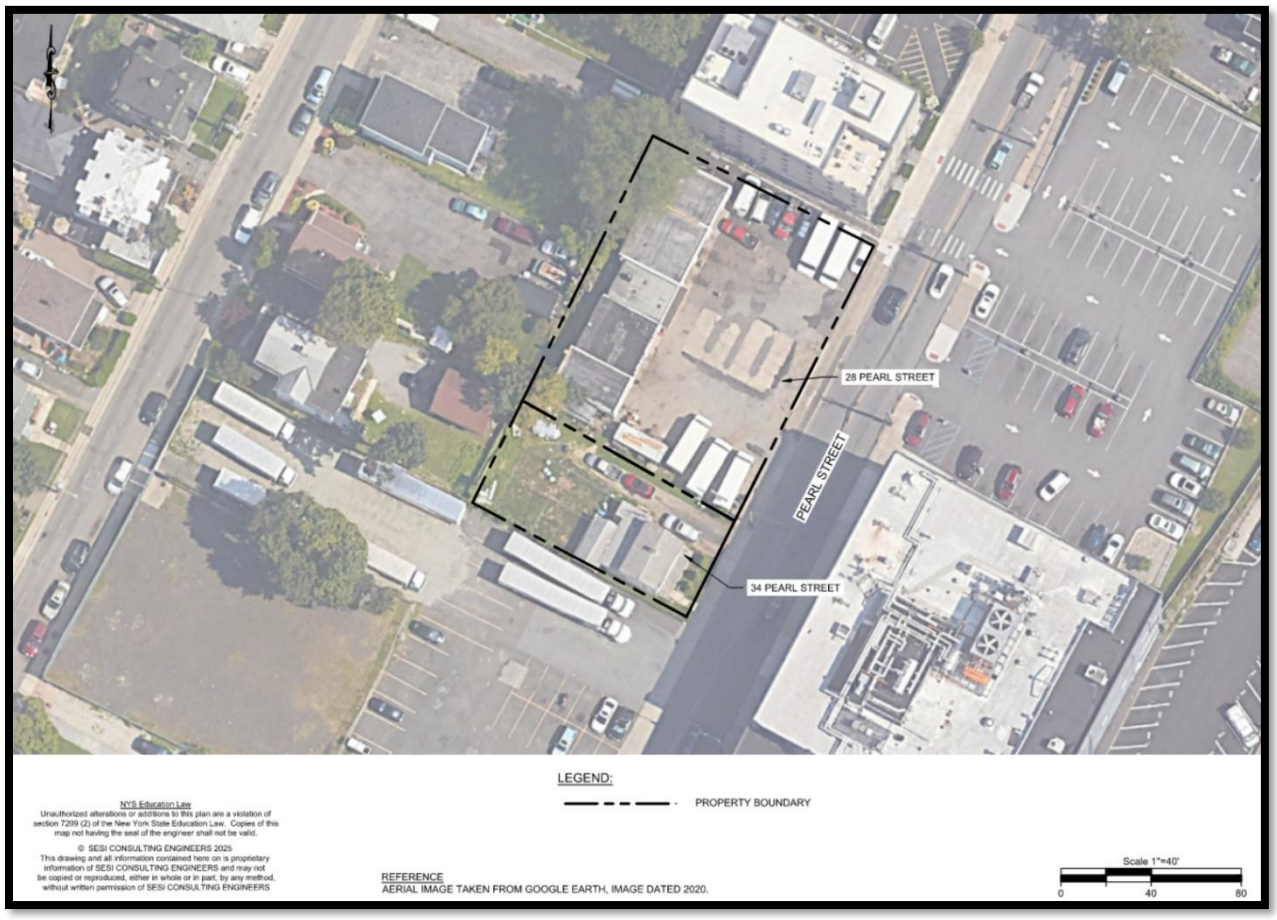
The HASP was written to meet the requirements of all applicable Federal, State, and local health and safety regulations, including 29 CFR 1910.120. The HASP is based on current knowledge regarding the specific chemical and physical hazards that are known or anticipated at the Site. This HASP is a dynamic document, for which changes and/or revisions may be realized as changes in scope and/or Site conditions are encountered. Should revised documents be produced, said revised documents will refer to the specific changes and why they were made.

All SESI employees are directed that all work must be performed in accordance with the SESI's Generic HASP and all Occupation Safety and Health Administration (OSHA)-applicable regulations for the work activities required for the project. All project personnel are furthermore directed that they are not permitted to enter Permit Required Confined Spaces (as defined by OSHA).

1.2 SITE AND FACILITY DESCRIPTION

The Site is located at 28–34 Pearl Street, Port Chester, New York, hereafter referred to as the "Site". The Site consists of two (2) contiguous parcels totaling 0.45 acres of land identified on the Westchester County Assessors map as tax lots 142.30-1.84 (28 Pearl Street) and 142.30-1.83 (34 Pearl Street). The 28 Pearl Street portion of the Site was formerly improved with a 3,240-square-foot single-story building that was demolished between 2022 and 2023. The building was previously occupied by a small engine repair and an automobile repair shop. The 34 Pearl Street portion of the Site was formerly improved with a 1,774-square-foot two (2)-story single-family dwelling that was demolished between 2022 and 2023. A Site Location Map is provided as **Figure 1.1.**

Figure 1.1 – Site Location Map



A Phase II Environmental Site Assessment (ESA) was conducted by HydroEnvironmental Solutions, Inc. (HES) in August 2020, and a Remedial Investigation (RI) was conducted by SESI Consulting Engineers in June 2025. The previous investigations identified elevated levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS) and metals in soil and groundwater, and VOCs in soil vapor.

This HASP does not discuss routine health and safety issues common to general construction and excavation, including, but not, limited to slips, trips, falls, shoring, and other physical hazards.

1.3 POLICY STATEMENT

The policy of SESI Consulting Engineers (SESI) is to provide a safe and healthful work environment. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety management is that all injuries, illnesses, and incidents are preventable. SESI will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or incident.

This HASP prescribes the procedures that must be followed by SESI personnel during activities at the Site. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM). This document will be reviewed periodically by the HSM to ensure that it is current and technically correct. Any changes in Site conditions and/or the scope of work will require a review and modification to this HASP. Such changes will be completed in the form of an addendum or a revision to the plan.

The provisions of this plan are mandatory for all SESI personnel and are advisory for all contractors, and subcontractors assigned to the project***. Subcontractors will be responsible for preparing their own Site-specific HASPs that meet the basic requirements outlined in this HASP.*** All visitors to SESI work areas at the Site must abide by the requirements of this plan.

1.4 REFERENCES

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, United States Environmental Protection Agency (USEPA) regulations, and SESI health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86116, October 1985).
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1910.
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (2004).
- *Threshold Limit Values*, ACGIH (2005).
- *Guide to Occupational Exposure Values*, ACGIH (2005).

- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).

1.5 DEFINITIONS

The following definitions (listed alphabetically) are applicable to this HASP:

- *Contamination Reduction Zone (CRZ)* - Area between the exclusion zone and support zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- *Exclusion Zone (EZ)* - Any portions of the site where hazardous substances are, or are reasonably suspected to be present, and pose an exposure hazard to on-Site personnel.
- *Incident* - All losses, including first aid cases, injuries, illnesses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions.
- *On-Site Personnel* - All SESI and subcontractors involved with the project.
- *Project* - All on-site work performed under the scope of work.
- *Site* - The area described in Section 1.2, Site and Facility Description, where the work is to be performed by SESI personnel and subcontractors.
- *Support Zone (SZ)* - All areas of the Site except the EZ and CRZ. The SZ surrounds the CRZ and EZ. Support equipment and break areas are located in this zone.
- *Subcontractor* - Includes contractor personnel hired by SESI.
- *Visitor* - All other personnel, except the on-Site personnel.
- *Work Area* - The portion of the Site where work activities are actively being performed. This area may change daily as work progresses and includes the SZ, CRZ, and EZ. If the work area is located in an area on the Site that is not contaminated, or suspected of being contaminated, the entire work area may be a SZ.

2.0 PROJECT SCOPE OF WORK

This HASP contains information for the following tasks that SESI is anticipated to conduct at the Site. Should additional and/or different tasks be identified, amendments to this HASP will be required to address these changed items.

- Mobilization;
- Soil, Groundwater, Vapor and Indoor Air Sampling; and
- Decontamination and Demobilization.

3.0 ROLES AND RESPONSIBILITIES

3.1 ALL PERSONNEL

All SESI project personnel must adhere to the procedures outlined in this HASP during the performance of their work. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner that conflicts with these procedures. After due warnings, the PM will dismiss from the site any SESI employee or subcontractor who violates safety procedures.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the Site.

The roles of key safety personnel and subcontractors are outlined in the following sections. Key project personnel and contacts are summarized in **Table 3.1**.

3.2 KEY SAFETY PERSONNEL

3.2.1 PROJECT OFFICER (PO)

The PO is responsible for providing resources to assure project activities are completed in accordance with this HASP, and for meeting all regulatory and contractual requirements.

3.2.2 PROJECT MANAGER (PM)

The PM is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The PM is responsible for confirming that the Field Supervisor (FS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP, and/or that subcontractors assigned to this project meet the requirements established by SESI. It is also the responsibility of the PM to:

- Consult with the HSM on Site health and safety issues;
- Verify that subcontractors meet health and safety requirements prior to commencing work;
- Verify that all incidents are thoroughly investigated;
- Approve, in writing, addenda or modifications of this HASP; and
- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance.

3.2.3 HEALTH AND SAFETY MANAGER (HSM)

The HSM or his designee has overall responsibility for the technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSM or his designee must approve changes or addenda to this HASP.

3.2.4 SITE SAFETY OFFICER (SSO)

The SSO is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The SSO will advise the PM on health and safety issues and will establish and coordinate the project air-monitoring program if one is deemed necessary (see Section 5.1, Air Monitoring). The SSO is the primary Site contact on health and safety matters. It is the responsibility of the SSO to:

- Provide on-Site technical assistance, if necessary;
- Participate in all accident/incident reports and ensure that they are reported to the HSM, client, and PM within 24 hours;
- Coordinate Site and personal air monitoring as required, including equipment maintenance and calibration;
- Conduct Site safety orientation training and safety meetings;
- Verify that project personnel have received the required physical examinations and medical certifications;
- Review Site activities with respect to compliance with this HASP;
- Maintain required health and safety documents and records; and
- Assist the FS in instructing field personnel on project hazards and protective procedures.

3.2.5 FIELD SUPERVISOR (FS)

The FS is responsible for implementing this HASP, including communicating requirements to on-Site personnel and subcontractors. The FS will be responsible for informing the PM of changes in the work plan, procedures, or Site conditions so that those changes may be addressed in this HASP. Other responsibilities are to:

- Consult with the SSO on Site health and safety issues;
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance;
- Obtain a Site map and determine and post routes to medical facilities and emergency telephone numbers;

- Notify local public emergency representatives (as appropriate) of the nature of the Site operations, and post their telephone numbers (i.e., local fire department personnel who would respond for a confined space rescue);
- Observe on-Site project personnel for signs of ill health effects;
- Investigate and report any incidents to the SSO;
- Verify that all on-Site personnel have had applicable training;
- Verify that on-Site personnel are informed of the physical, chemical, and biological hazards associated with the Site activities, and the procedures and protective equipment necessary to control the hazards; and
- Issue/obtain any required work permits (hot work, confined space, etc.).

3.2.6 FIELD PERSONNEL (FP)

All SESI field personnel are responsible for following the Health and Safety procedures specified in this HASP and work practices specified in applicable operation procedures. Some specific responsibilities include, but are not limited to:

- Reading and understanding the HASP;
- Reporting all accidents, incidents, injuries, or illnesses to the FS;
- Complying with the requests of the SSO;
- Immediately communicating newly identified hazards or noncompliance issues to the FS or SSO; and
- Stopping work in cases of immediate danger.

3.3 SUBCONTRACTORS

Subcontractors and their personnel must understand and comply with applicable regulations and Site requirements established in this HASP. Subcontractors will prepare their own Site-specific HASP that must be consistent with the requirements of this HASP.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating Site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the Site. Additionally, on-Site subcontractor personnel must conduct daily Site safety meetings.

Subcontractors must designate individuals to function as the PM, HSM, SSO, and FS. In some firms the HSM to be carried out by the PM. This is acceptable provided the PM has the required knowledge, training, and experience to properly address all hazards associated with the work, and to prepare, approve, and oversee the execution of the Site-specific HASP. A subcontractor may designate the same person to perform the duties of both the SSO and the FS. However,

depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

3.4 STOP WORK AUTHORITY

Every SESI employee and subcontractor is empowered, expected, and has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3.5 ALL ON-SITE PERSONNEL

All on-Site SESI personnel (including SESI subcontractors) must read and acknowledge their understanding of their respective HASPs before commencing work and abide by the requirements of the plans. All on-Site SESI personnel shall sign their HASP Acknowledgement Form following their review of their HASP.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating Site activities. In addition, all on-Site personnel will attend an initial hazard briefing provided by the SSO prior to beginning work at the Site and conduct daily safety meetings thereafter.

On-Site personnel will immediately report the following to the FS or SSO:

- Personal injuries and illnesses no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or hazardous situations;
- Unsafe or malfunctioning equipment;
- Changes in site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

3.6 VISITORS

All SESI personnel and subcontractors visiting the Site must check in with the FS. Visitors will be cautioned to avoid skin contact with surfaces, soils, groundwater, or other materials that may impacted or be suspected to be impacted by contaminants of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entry to the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months.

Table 3.1 – Key Safety Personnel

SESI Personnel		
Role	**Name**	**Telephone No.**
Project Principal	Fuad Dahan, P.E., PhD	973-808-9050 x249
Project Manager (PM)	Sean Mullin	973-808-9050 x277
Principal Engineer	Fuad Dahan, P.E., PhD	973-808-9050 x249
Remedial Action Project Manager	Sean Mullin	973-808-9050 x277
Field Team Leader	MaryKate Chorazak	973-808-9050 x283
Quality Assurance Officer	Joe Scardino	973-808-9050 x267
Field Personnel	TBD	

4.0 PERSONAL PROTECTIVE EQUIPMENT

4.1 LEVELS OF PROTECTION

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in **Table 4.1**.

4.1.1 LEVEL D PROTECTION

The minimum level of protection that will be required of project personnel at the site will be Level D, which will be worn when site conditions or air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting American National Standards Institute (ANSI) Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Leather work gloves and/or nitrile surgical gloves;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and

Personal floatation device (PFD) if working on or near the water.

4.1.2 MODIFIED LEVEL D PROTECTION

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present an increased potential for skin contact with contaminated materials. Modified Level D consists of:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Face shield in addition to safety glasses or goggles when projectiles or splash hazards exist (e.g. during Power Washing activities);
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used);
- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated; and
- PFD if working on or near the water.

4.1.3 LEVEL C PROTECTION

Level C protection will be required when the airborne concentration of COC reaches one-half of the OSHA Permissible Exposure Limit or ACGIH TLV. The following equipment will be used for Level C protection:

- Full-face, air-purifying respirator with combination organic vapor/HEPA cartridges;
- Polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves;
- Nitrile gloves worn over nitrile surgical gloves;
- Steel toe work boots, meeting ANSI Z41;
- Chemical-resistant boots with steel toes or latex/PVC overboots over steel toe boots;
- Hard hat, meeting ANSI Z89;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.2 SELECTION OF PPE

Equipment for personal protection will be selected based on the potential for contact, site conditions, ambient air quality, and the judgment of supervising Site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the Site.

4.3 SITE RESPIRATOR PROTECTION PROGRAM

Respiratory protection is an integral part of employee health and safety at the Site due to potentially hazardous concentrations of airborne COCs. The Site respiratory protection program will consist of the following (as a minimum):

- All on-Site personnel who may use respiratory protection will have an assigned respirator.
- All on-Site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months. Documentation of the fit test must be provided to the SSO prior to commencement of work.
- All on-Site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the SSO, prior to commencement of Site work.
- Only cleaned, maintained, NIOSH-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-Site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.

- Respirators will be inspected, and a negative pressure test performed prior to each use.

After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

4.4 USING PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

4.4.1 DONNING PROCEDURES

These procedures are mandatory only if Modified Level D or Level C PPE is used on the Site:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator and perform appropriate fit check (Level C);
- Put hood or head covering over-head and respirator straps and tape hood to facepiece (Level C); and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

4.4.2 DOFFING PROCEDURES

The following procedures are only mandatory if Modified Level D or Level C PPE is required for the Site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face, and neck (or shower if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 6.2, Decontamination, for detailed information on decontamination stations.

4.5 SELECTION MATRIX

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the FS and SSO of the potential for skin contact with COCs. The PPE selection matrix is presented in **Table 4.1** below. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in **Table 5.1**, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 4.1 – PPE Selection Matrix

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Drilling)	Modified Level D/Level C
Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

5.0 AIR AND NOISE MONITORING

5.1 AIR MONITORING

Air monitoring, sampling, and testing will be conducted to determine employee exposure to airborne constituents. The monitoring results will dictate work procedures and the selection of PPE. The SESI SSO will be responsible for defining appropriate air monitoring procedures and for utilizing the air monitoring results to determine appropriate procedures and PPE for project personnel. Air monitoring results should be recorded in field notebooks or on an air monitoring log (see Attachment 1 for a copy of the Air Monitoring Log). Any deviations from the procedures listed here should be documented and explained in the Air Monitoring Log.

The monitoring devices to be used are a PDR1000 particulate monitor (or equivalent) and a Rae Systems MultiRAE detector (PID with a 10.6 eV lamp/oxygen/LEL/hydrogen sulfide sensors). Colorimetric detector tubes or similar detecting devices may be utilized to estimate airborne concentrations of benzene and vinyl chloride and should be onsite during any activities that may result in elevated PID readings including drilling, excavating, and groundwater sampling.

Air monitoring will be conducted continuously with a 4-gas monitor to detect the %LEL, oxygen, carbon monoxide and hydrogen sulfide during drilling in areas where flammable vapors or gases are suspected. All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10% of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

5.2 NOISE MONITORING

Noise monitoring may be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

5.3 MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a

calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the SSO and maintained by the FS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturer's procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturer's procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSO must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The SSO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

5.4 ACTION LEVELS

Table 5.1 below presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the Site.

Table 5.1 – Airborne Contaminant Action Levels

Parameter	Reading	Action
Total Hydrocarbons	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 5 ppm	Increase monitoring frequency to every 15 minutes and use benzene detector tube to screen for the presence of benzene
	≥ 5 ppm to ≤ 50 ppm	Upgrade to Level C PPE; continue screening for benzene
	> 50 ppm	Stop work; investigate cause of reading
	At any reading > 5 ppm	Monitor perimeter per CAMP
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading

Parameter	Reading	Action
Chlorinated VOCs	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading
Dust	0 to .05 mg/m3	Normal operations
	0.05 to 0.1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 0.15 mg/m3	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen Sulfide	0 ppm to ≤ 5 ppm	Normal operations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors

6.0 WORK ZONES AND DECONTAMINATION

6.1 WORK ZONES

6.1.1 AUTHORIZATION TO ENTER

Only personnel with the appropriate training and medical certifications (if respirators are required) will be allowed to work at the project Site. The FS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed to enter the Site work areas.

6.1.2 SITE ORIENTATION AND HAZARD BRIEFING

No person will be allowed in the work area during Site operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the FS or SSO and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the Site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this plan.

6.1.3 CERTIFICATION DOCUMENTS

A training and medical file may be established for the project and kept on Site during all Site operations. Specialty training, such as first aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All project personnel must provide their training and medical documentation to the SSO prior to starting work.

6.1.4 ENTRY LOG

A log-in/log-out sheet will be maintained at the Site by the FS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the FS may document entry and exit in the field notebook.

6.1.5 ENTRY REQUIREMENTS

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any SESI work area unless they are wearing the minimum PPE as described in Section 4.0.

6.1.6 EMERGENCY ENTRANCE AND EXIT

People who must enter the work area on an emergency basis will be briefed of the hazards by the FS or SSO. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a designated safe area for a head count. The FS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.1.7 CONTAMINATION CONTROL ZONES

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

6.1.8 EXCLUSION ZONE (EZ)

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a posted Site diagram will identify the location of each EZ.

6.1.9 CONTAMINATION REDUCTION ZONE

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on Site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the support zone discussed below.

6.1.10 SUPPORT ZONE (SZ)

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to Site requirements.

6.1.11 POSTING

Work areas will be prominently marked and delineated using cones, caution tape, or a posted Site diagram.

6.1.12 SITE INSPECTIONS

The FS will conduct a daily inspection of Site activities, equipment, and procedures to verify that the required elements are in place.

6.2 DECONTAMINATION

6.2.1 PERSONNEL DECONTAMINATION

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1*: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- *Station 2*: Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- *Station 3*: Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

6.2.2 EQUIPMENT DECONTAMINATION

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

6.2.3 PERSONAL PROTECTIVE EQUIPMENT DECONTAMINATION

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the Site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water (mixed at 2% bleach by volume), or by using a spray disinfectant.

7.0 TRAINING AND MEDICAL SURVEILLANCE

7.1 TRAINING

7.1.1 GENERAL

All on-Site project personnel who work in areas where they may be exposed to Site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three (3) days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight (8)-hour refresher course within the past 12 months. The FS must have completed an additional eight (8) hours of supervisory training and must have a current first-aid/CPR certificate (See Attachment 2).

7.1.2 BASIC 40-HOUR COURSE

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which employees can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs which might indicate overexposure to hazards;
- Worker right-to-know (Hazard Communication OSHA 1910.1200);
- Routes of exposure to contaminants;
- Engineering controls and safe work practices;
- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;
- Confined-space entry procedures; and
- General emergency response procedures.

7.1.3 SUPERVISOR COURSE

Management and supervisors must receive an additional eight (8) hours of training, which typically includes:

- General Site safety and health procedures;
- PPE programs; and

- Air monitoring techniques.

7.1.4 SITE-SPECIFIC TRAINING

Site-specific training will be accomplished by on-Site personnel reading this HASP, and through a thorough site briefing by the PM, FS, or SSO on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

7.1.5 DAILY SAFETY MEETINGS

Daily safety meetings will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures. The FS or SSO should present these meetings prior to beginning the day's fieldwork. No work will be performed in an EZ before a daily safety meeting has been held. An additional safety meeting must also be held prior to new tasks, or if new hazards are encountered. The daily safety meetings will be logged in the field notebook.

7.1.6 FIRST AID AND CPR

At least one (1) employee current in first aid/CPR will be assigned to the work crew and will be on the Site during operations. Site records will document the presence of this individual. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

7.2 MEDICAL SURVEILLANCE

7.2.1 MEDICAL EXAMINATION

All personnel who are potentially exposed to Site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

7.2.2 PRE-PLACEMENT MEDICAL EXAMINATION

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire;

- Physical examination;
- Complete blood count, with differential;
- Liver enzyme profile;
- Chest X-ray, at a frequency determined by the physician;
- Pulmonary function test;
- Audiogram;
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- Drug and alcohol screening, as required by job assignment;
- Visual acuity; and
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project Site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

7.2.3 OTHER MEDICAL EXAMINATIONS

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials; and
- At the discretion of the SSO, HSM, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

7.2.4 PERIODIC EXAM

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

7.2.5 MEDICAL RESTRICTION

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the SSO. The terms of the restriction will be discussed with the employee and the supervisor.

8.0 GENERAL SAFETY PRACTICES

8.1 GENERAL SAFETY RULES

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of this HASP must be in a location at the Site that is readily available to personnel, and all project personnel shall review the plan prior to starting work.
- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE as required and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and ensure closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by COCs must be reported to the FS or SSO immediately. If needed, medical attention should be sought.
- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE as required in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.
- Removing soil containing Site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, fire, etc.
- Report all injuries, illnesses, and unsafe conditions or work practices to the FS or SSO.
- Use the “buddy system” during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so, and in accordance with the manufacturer’s directions.
- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday, including breaks, is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that indicate they may cause drowsiness or, that you should not operate heavy equipment.
- Remain upwind during site activities whenever possible.

8.2 BUDDY SYSTEM

On-Site personnel must use the buddy system as required by operations. Use of the "buddy system" is required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D operations. Crewmembers must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration;
- Changes in coordination;
- Changes in demeanor;
- Excessive salivation and pupillary response; and
- Changes in speech pattern.

Crewmembers must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- Headaches;
- Dizziness;
- Nausea;
- Blurred vision;
- Cramps; and
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.3 HEAT STRESS

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and

be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for six (6) to eight (8) hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

8.4 HEAT STRESS SAFETY PRECAUTIONS

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in **Table 8.1** below.

Table 8.1 – Work/Rest Schedule

Adjusted Temperature[b]	Work/Rest Regimen Normal Work Ensemble[c]	Work/Rest Regimen Impermeable Ensemble
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º - 90ºF (30.8º-32.2ºC)	After each 60 minutes of work	After each 30 minutes of work
82.5º - 87.5ºF (28.1º - 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º - 82.5ºF (25.3º - 28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º - 77.5ºF (30.8º - 32.2ºC)	After each 150 minutes of work	After each 120 minutes of work

a. For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)
b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
d. The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific Site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any Site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-Site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

8.5 COLD STRESS

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two (2) factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at -18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in **Table 8.2** below.

Table 8.2– Wind Chill Temperature Chart

Estimated Wind Speed (in mph)	**Actual Temperature Reading (ºF)**											
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**	**-50**	**-60**
	Equivalent Chill Temperature (ºF)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER Maximum danger of false sense of security.**				**INCREASING DANGER Danger from freezing of exposed flesh within one minute.**			**GREAT DANGER Flesh may freeze within 30 seconds.**				
	Trench foot and immersion foot may occur at any point on this chart.											

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- *Frost Nip or Incipient Frostbite* - characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.

- *Deep Frostbite* - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

8.6 SAFETY PRECAUTIONS FOR COLD STRESS PREVENTION

For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. Wet field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

8.7 SAFE WORK PROCEDURES

Direct contact between bare skin and cold surfaces (< 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing. Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

8.8 BIOLOGICAL HAZARDS

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, spiders, and other pests.

8.8.1 TICK BORNE DISEASES

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Erlichiosis - The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (Rickettsia rickettsii) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

8.8.2 POISONOUS PLANTS

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have

touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

8.8.3 SNAKES

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snakebite occurs, an attempt should be made to safely identify the snake via size and markings. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

8.8.4 SPIDERS

Personnel may encounter spiders during work activities.

Two spiders are of concern: the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and has a distinctive red hourglass marking on the underside of its body. The black widow is found throughout the United States. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. It has a distinctive violin shape on the top of its body. The brown recluse is more prevalent in the southern

United States. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control - To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

8.9 NOISE

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 5.2, Noise Monitoring.
Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

All personnel must take every precaution to minimize the potential for spills during site operations. All on-Site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the Site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0,

Emergency Procedures, to contain and control released materials and to prevent their spread to off-Site areas.

8.10 SPILL CONTROL

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8.11 SANITATION

Site sanitation will be maintained according to OSHA requirements.

8.11.1 BREAK AREA

Breaks must be taken in the SZ, away from the active work area after Site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

8.11.2 POTABLE WATER

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media, and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

8.11.3 SANITARY FACILITIES

Access to facilities for washing before eating, drinking, or smoking, or alternate methods such as waterless hand-cleaner and paper towels will be provided.

8.11.4 LAVATORY

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided. This requirement does not apply to mobile crews or to normally unattended Site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

8.12 EMERGENCY EQUIPMENT

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 will be on Site prior to the commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 1926;
- Industrial first aid kits of adequate size for the number of personnel on site; and
- Emergency eyewash and/or shower if required by operations being conducted on Site.

8.13 LOCKOUT/TAGOUT PROCEDURES

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controls may not be operated until the personnel who attached the tag remove the tag.

8.14 ELECTRICAL SAFETY

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations.
- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

8.15 LIFTING SAFETY

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.

- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

8.16 LADDER SAFETY

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least three (3) feet (9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment.

- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSM for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective or be tagged with “Do Not Use” or similar language and shall be withdrawn from service.
- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

8.17 TRAFFICE SAFETY

The project Site may be located adjacent to a public roadway where exposure to vehicular traffic is likely. Traffic may also be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

Cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A “Slow” or “Men Working” sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All Site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk

or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

9.0 SITE-SPECIFIC HAZARDS AND CONTROL MEASURES

9.1 EVALUATION OF HAZARDS

The evaluation of hazards is provided as a quick reference as to the known conditions for the Site, wherein the level of detail for each of the subsections is identified.

9.1.1 HAZARD CHARACTERISTICS

Existing information for Site:

__X__ Detailed _____ Preliminary _____ None

Hazardous/Contaminated Material Form(s):

__X__ Solid __X__ Liquid __X__ Sludge ___ Gas __X__ Vapor

Containment Type(s):

__X__ Drum _____ Tank _____ Pit _____ Debris

_____ Pond _____ Lagoon Other: None known

Hazardous Material Characteristics:

__X__ Volatile _____ Corrosive _____ Reactive _____ Radioactive

__X__ Ignitable __X__ Toxic __X__ Unknown

Routes of Exposure:

__X__ Oral __X__ Dermal __X__ Eye __X__ Respiratory

9.1.2 POTENTIAL HEALTH AND SAFETY HAZARDS

X Heat	X Excavation
X Congested areas	X Fire
X Cold	X Cave-ins
X General Construction	X Explosion
X Confined space entry	X Falls, slippage
X Physical injury	X Biological Hazards
X Oxygen depletion	X Heavy equipment
X Electrical hazards	X Plants – Poison Ivy, Poison Oak
X Asphyxiation	X Other: Potential Ignition Hazard
X Handling and product transfer	X Insects – Ticks

X Non-ionizing Radiation (i.e. UV, IR, etc.)
X Insects – Mosquitoes
X Insects – Bees and Wasps
X Rats and Mice

9.2 FIELD ACTIVITIES, HAZARDS AND CONTROL PROCEDURES

The following task-specific safety analyses identify potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the Site to identify hazards that may affect on-Site personnel, the community, or the environment. The FS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The FS will keep on-Site personnel informed of the changing conditions, and the PM will write and/or approve addenda or revisions to this HASP as necessary.

9.2.1 MOBILIZATION/CONSTRUCTION STAKEOUT

Description of Tasks

Site mobilization will include establishing sampling locations, determining the location of utilities and other installations, and establishing work areas on the Site. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the Site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The hazards of this phase of activity are associated with heavy equipment operation, manual materials handling, installation of temporary on-site facilities, and manual site preparation.

Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.2.2 DEMOLITION/SITE-CLEARING

Description of Tasks

Site clearance will involve manual or mechanical removal of objects impeding access to the construction footprint. These obstructions are both natural and man-made items and will include, but not be limited to, fabricated metal and concrete structures, trees, vegetation, rubble, and miscellaneous trash/debris.

Hazard Identification

Hazards associated with demolition and site clearance include personnel working in and around potentially unstable structures, or locations of potential contact with hazardous chemicals, utilities, and/or falling objects. This task will involve manual, as well as mechanical demolition/clearance efforts so exertion and equipment hazards exist.

Controls

PPE – Personnel shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

Preparatory Operations – Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a licensed Professional Engineer, of the structure to determine the stability of the structure. Any adjacent structure shall where personnel may be exposed shall also be similarly checked. The PO shall have in writing evidence that such a survey has been performed. All structural instabilities shall be shored or braced, under the supervision of a licensed Professional Engineer, prior to access by an FP.

Utilities – All electric, gas, water, steam, sewer, and other service lines shall be shut off, caped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary.

Hazardous Substances – It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Falling Debris/Objects – No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effective protected. Access to the area where falling objects/debris may be encountered must be gated and controlled.

Structural Collapse – Structural or load supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load. Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are not of sufficient strength to support the imposed load.

Rollover Guards – All equipment used in site clearing operations shall be equipped with rollover guards meeting the applicable requirements. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the applicable requirements.

Inspections – During demolition, continuing inspections by a licensed Professional Engineer shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No FP shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.2.1 DISTURBANCE/HANDLING OF CONTAMINATED MATERIAL

Description of Tasks

After the contaminated soil is excavated from below the Site's surface, the material will be stockpiled, dried, and either transported off Site or relocated and backfilled on Site.

Hazard Identification

The hazards associated with materials handling include contact of the contaminated material with project personnel, or cross contamination with other site soil.

Controls

Cross Contamination – Following excavation, contaminated soil stockpiles will be placed on a structure constructed to separate the material from the site soil and collect any groundwater leachate. The material shall be covered to prevent storm water erosion or migration of contaminants through storm water.

Air Monitoring – Air and particulate monitoring will be conducted during soil excavation activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors or particulates in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. Air monitoring protocols are also presented in the Community Air Monitoring Plan (Appendix F of this RIWP). A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.3 DRILLING/SUBSURFACE INTRUSION ACTIVITIES

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary Site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this

initial phase, project personnel will walk the Site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The primary physical hazards for this activity are associated with the use of soil boring and grouting equipment. The equipment is hydraulically powered and uses static force and dynamic percussion force to advance sampling and penetrating tubes.

Accidents can occur as a result of improperly placing the equipment on uneven or unstable terrain or failing to adequately secure the equipment prior to the start of operations. Overhead utility lines can create hazardous conditions if contacted by the equipment. Underground installations such as electrical lines, conduit, and product lines pose a significant hazard if contacted.

Controls

Geoprobe and Drill Rig Safety Procedures - The operator of the equipment must possess required state or local licenses to perform such work. All members of the crew shall receive Site-specific training prior to beginning work.

The operator is responsible for the safe operation of the rig, as well as the crew's adherence to the requirements of this HASP. The operator must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the operator, wear all personal protective equipment, and be aware of all hazards and control procedures. The operator and crew must participate in the Daily Safety Meetings and be aware of all emergency procedures.

Equipment Inspection - Each day, prior to the start of work, the rig and associated equipment must be inspected by the operator. The following items must be inspected:

- Vehicle condition;
- Proper storage of equipment;
- Condition of all hydraulic lines;
- Fire extinguisher; and
- First aid kit.

Equipment Set Up - The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels which remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

All well sites will be inspected by the driller prior to the location of the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

The drill rig must be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Rules for Intrusive Activity - Before beginning any intrusive activity, the existence and location of underground pipe, conduit, electrical equipment, and other installations will be determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. “Call Before You Dig” will verify the potential for encountering subsurface utilities. If the client’s knowledge of the area is incomplete, an appropriate device, such as a magnetometer, will be used to locate the line.

Combustible gas readings of the general work area will be made regularly in areas where and/or during operations when the presence of flammable vapors or gases is suspected, such as during intrusive activities (see Section 5.1). Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10% of the LEL in the immediate area (a one-foot radius) of the point of drilling, or near any other ignition sources.

Overhead Electrical Clearances - If equipment is operated in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as follows:

Nominal System Voltage	Minimum Required Clearance
0-50kV	10 feet
51-100kV	12 feet
101-200kV	15 feet
201-300kV	20 feet
301-500kV	25 feet
501-750kV	35 feet
751-1,000kV	45 feet

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least four (4) feet for voltages less than 50kV, 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Hoisting Operations - Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly. Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrickman has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline. The cathead area must be kept free of obstructions and entanglements.
The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or catline which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load;
- Keep fingers and feet where they will not be crushed;
- Be sure to signal clearly when the load is being picked;
- Use standard visual signals only and not depend on shouting to coworkers; and
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or re-socketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less that five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Pipe/Auger Handling - Pipe and auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Employees are not permitted to kick slips into position.

When pipe is being hoisted, personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be secured to prevent rolling.

9.2.4 SUBSURFACE CHEMICAL SAMPLE/COLLECTION ANALYSIS

Description of Tasks

This sub-task consists of the collection of soil samples for subsequent field and laboratory analysis. The physical hazards of soil sampling are primarily associated with the sample collection methods, procedures utilized, and the environment itself.

Hazard Identification

Incidental contact with COCs is the primary hazard associated with sampling the stabilized material. This contact may occur through the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. The primary hazards associated with these sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards directly associated with sampling procedures are generally limited to strains/sprains and potential eye hazards. Potential chemical hazards may include contact with media containing Site COCs and potential contact with chemicals used for equipment decontamination.

Controls

PPE – To control dermal exposure during sampling activities, a minimum of Level D protection will be worn. If necessary, based on field observations and site conditions, air monitoring may be conducted during sediment sampling activities. If the results of air monitoring indicate the presence of airborne contaminants in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. Air monitoring protocols are also presented in the Community Air Monitoring Plan (Appendix F of this RIWP). A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

9.2.5 DECONTAMINATION

All equipment will be decontaminated before leaving the Site. Personnel involved in decontamination activities may be inadvertently exposed to skin contact with contaminated materials and chemicals brought from the EZ. Personnel involved in decontamination activities must wear PPE that is, at a minimum, one level below the level worn by personnel working in the EZ.

9.2.6 DEMOBILIZATION

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards, and hot surfaces, to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat-or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.3 CHEMICAL HAZARDS

The chemical hazards associated with Site operations are related to inhalation, ingestion, and skin exposure to Site COCs. Concentrations of airborne COCs during Site tasks may be measurable and will require air monitoring during certain operations. Air monitoring requirements for Site tasks are outlined in Section 5.1. Air monitoring protocols are also presented in the Community Air Monitoring Plan (Appendix of the RIWP).

COCs at the Site include VOCs, SVOCs, pesticides, metals and PFAS.

The potential for inhalation of site COCs is moderate. The potential for dermal contact with soils containing Site COCs during remedial operations is moderate. **Table 9.1** lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 9.1 – List of Primary Contaminants

Media: Soil		
Volatiles (VOCs)	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
1,2,4-Trimethylbenzene	1600	PID
1,2-Dichlorobenzene	60	PID
1,2-Dichloroethane	5.6	PID
1,3,5-Trimethylbenzene	470	PID
1,4-Dichlorobenzene	4.2	PID
2-Butanone (MEK)	84	PID
Acetone	0.190	PID
Benzene	120	PID
Ethylbenzene	410	PID
Methylene Chloride	7.6	PID
n-Butylbenzene	140	PID
n-Propylbenzene	220	PID
sec-Butylbenzene	40	PID
Tetrachloroethene	10	PID
Toluene	820	PID
Trichloroethene	15	PID
Xylenes, Total	2300	PID
Metals	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Arsenic	13.7	Not Applicable
Barium	438	Not Applicable
Cadmium	5.62	Not Applicable
Chromium, Total	75.3	Not Applicable
Copper	83.5	Not Applicable
Lead	27200	Not Applicable
Mercury	4.8	Not Applicable
Nickel	82.5	Not Applicable
Zinc	822	Not Applicable
Semi-Volatiles (SVOCs)	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
2-Methylphenol	23	Not Applicable
3&4-Methylphenol	65	Not Applicable
Benzo(a)anthracene	7.9	Not Applicable
Benzo(g,h,i)perylene	11	Not Applicable
Chrysene	9.2	Not Applicable
Dibenzofuran	3.2	Not Applicable
Polychlorinated Biphenyls (PCBs)	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Aroclor 1284	0.454	Not Applicable
Aroclor 1422	0.205	Not Applicable
Pesticides	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
4,4'-DDD	0.0157	Not Applicable
4,4'-DDE	0.046	Not Applicable
4,4'-DDT	0.115	Not Applicable
Dieldrin	0.0054	Not Applicable

Media: Groundwater		
Volatiles (VOCs)	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
1,2,4,5-Tetramethylbenzene	130	PID
1,2,3-Trichloropropane	5	PID
1,2,4-Trimethylbenzene	54	PID
1,2-Dichloroethane	5.6	PID
2-Butanone (MEK)	140	PID
Acetone	1,200	PID
Benzene	110	PID
Ethylbenzene	170	PID
Isopropylbenzene	100	PID
M&p Xylenes	5.8	PID
Methylene Chloride	270	PID
n-Butylbenzene	41	PID
n-Propylbenzene	270	PID
o-Xylene	32	PID
p-Isopropyltoluene	27	PID
sec-Butylbenzene	140	PID
Toluene	72	PID
Xylenes, Total	110	PID
Semi-Volatiles (SVOCs)	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
2,4-Dimethylphenol	15	Not Applicable
Benzo(a)anthracene	0.08	Not Applicable
Benzo(a)pyrene	0.07	Not Applicable
Benzo(b)fluoranthene	0.07	Not Applicable
Benzo(k)fluoranthene	0.04	Not Applicable
Chrysene	0.06	Not Applicable
Indeno(1,2,3-cd)pyrene	0.08	Not Applicable
Naphthalene	18	Not Applicable
Phenol	11	Not Applicable
PFAS	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
PFOS	50.2	Not Applicable
PFOA	35.4	Not Applicable
Metals	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
Iron	33800	Not Applicable
Lead	47.23	Not Applicable
Manganese	2094	Not Applicable
Selenium	10.1	Not Applicable
Sodium	528000	Not Applicable
Pesticides	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
4,4'-DDD	0.40	Not Applicable
4,4'-DDE	0.29	Not Applicable
4,4'-DDT	47.4	Not Applicable
alpha-BHC	2.3	Not Applicable
beta-BHC	0.12	Not Applicable
Dieldrin	0.006	Not Applicable
Lindane	0.14	Not Applicable

Media: Soil Vapor		
Volatiles (VOCs)	**Maximum Concentration (ug/m^3)**	**Applicable Monitoring Instrument**
1,2,4-Trimethylbenzene	32	PID
1,3,5-Trimethylbenzene	9.3	PID
1,3-Butadiene	1470	PID
1,4-Dioxane	41.4	PID
2-Butanone (MEK)	78.2	PID
2,2,4-Trimethylpentane	696000	PID
4-Ethyltoluene	2.1	PID
Acetone (2-Propanone)	89600	PID
Benzene	20200	PID
Carbon disulfide	25	PID
Chloromethane	5.2	PID
Cyclohexane	256000	PID
Dichlorodifluoromethane	38	PID
Ethanol	5650	PID
Ethyl Acetate	525	PID
Ethylbenzene	5,500	PID
Heptane	145000	PID
Hexachlorobutadiene	81	PID
Hexane	539000	PID
Isopropyl Alcohol	649000	PID
m,p-Xylene	187	PID
Methyl Isobutyl Ketone	11	PID
Methylene chloride	5790	PID
n-Heptane	2,700	PID
n-Hexane	530,000	PID
o-Xylene	510	PID
Propylene	388	PID
Tertiary Butyl Alcohol	17	PID
Tetrachloroethylene	1,100	PID
Tetrahydrofuran	6.5	PID
Toluene	95.3	PID
Trichloroethylene	5.4	PID
Trichlorofluoromethane	3.1	PID
Vinyl Acetate	2.8	PID
Xylenes (total)	248	PID

10.0 EMERGENCY PROCEDURES

10.1 GENERAL

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the FS/SSO immediately.

The FS/SSO will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of this route and the assembly area.

10.2 EMERGENCY RESPONSE

If an incident occurs, the following steps will be taken:

- The FS/SSO will evaluate the incident and assess the need for assistance and/or evacuation;
- The FS/SSO will call for outside assistance as needed;
- The FS/SSO will ensure the PM is notified promptly of the incident;
- The FS/SSO will take appropriate measures to stabilize the incident scene; and
- The PM will notify the NYSDEC Project Manager.

10.2.1 FIRE

In the case of a fire at the Site, the FS/SSO will assess the situation and direct fire-fighting activities. The FS/SSO will ensure that the PM is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that Site personnel are unable to safely extinguish with one (1) fire extinguisher, the local fire department will be summoned.

10.2.2 CONTAMINANT RELEASE

In the event of a contaminant release, the following steps will be taken:

- Notify FS/SSO immediately;
- Evacuate immediate area of release;
- Conduct air monitoring to determine needed level of PPE;
- Don required level of PPE and prepare to implement control procedures; and
- After control procedures are implemented the FS/SSO will inform the project PM who will then inform NYSDEC PM

The FS/SSO has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-Site areas.

10.3 MEDICAL EMERGENCY

All employee injuries must be promptly reported to the SSO/FS, who will:

- Ensure that the injured employee receives prompt first aid and medical attention;
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- If the injured person is a SESI employee, notify SESI at 973-808-9050.

10.3.1 EMERGENCY CARE STEPS

Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.

- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.

Treat other conditions as necessary. If the victim can be moved, take him/her to a location away from the work area where EMS can gain access.

10.4 FIRST AID GENERAL

All persons must report any injury or illness to their immediate supervisor or the FS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The FS and SSO must fill out an accident/incident report as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The report must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person

is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.4.1 FIRST AID—INHALATION

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Site Safety Procedures, will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.2 FIRST AID—INGESTION

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

10.4.3 FIRST AID—SKIN CONTACT

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ, to the wash area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he/she shows any sign of skin reddening, irritation, or if he/she requests a medical examination.

10.4.4 FIRST AID—EYE CONTACT

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 REPORTING INJURIES, ILLNESSES, AND SAFETY INCIDENTS

Injuries and illnesses, however minor, will be reported to the FS immediately. The FS will complete an injury report and submit it to the HSM, and the PM by end of shift.

10.6 EMERGENCY INFORMATION

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in **Table 10.1** below.

Table 10.1 – Emergency Contacts

Local Emergency Contacts	**Telephone No.**
EMERGENCY	911
Greenwich Hospital	(203) 863-3000
Police Emergency	911
Fire Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	**Telephone No.**
N.Y. Poison Control Center	(800) 222-1222
National Response Center and Terrorist Hotline	(800) 424-8802
Center for Disease Control	(800) 311-3435
Utility Mark-Out	(800) 962-7962

10.6.1 DIRECTIONS TO HOSPITAL

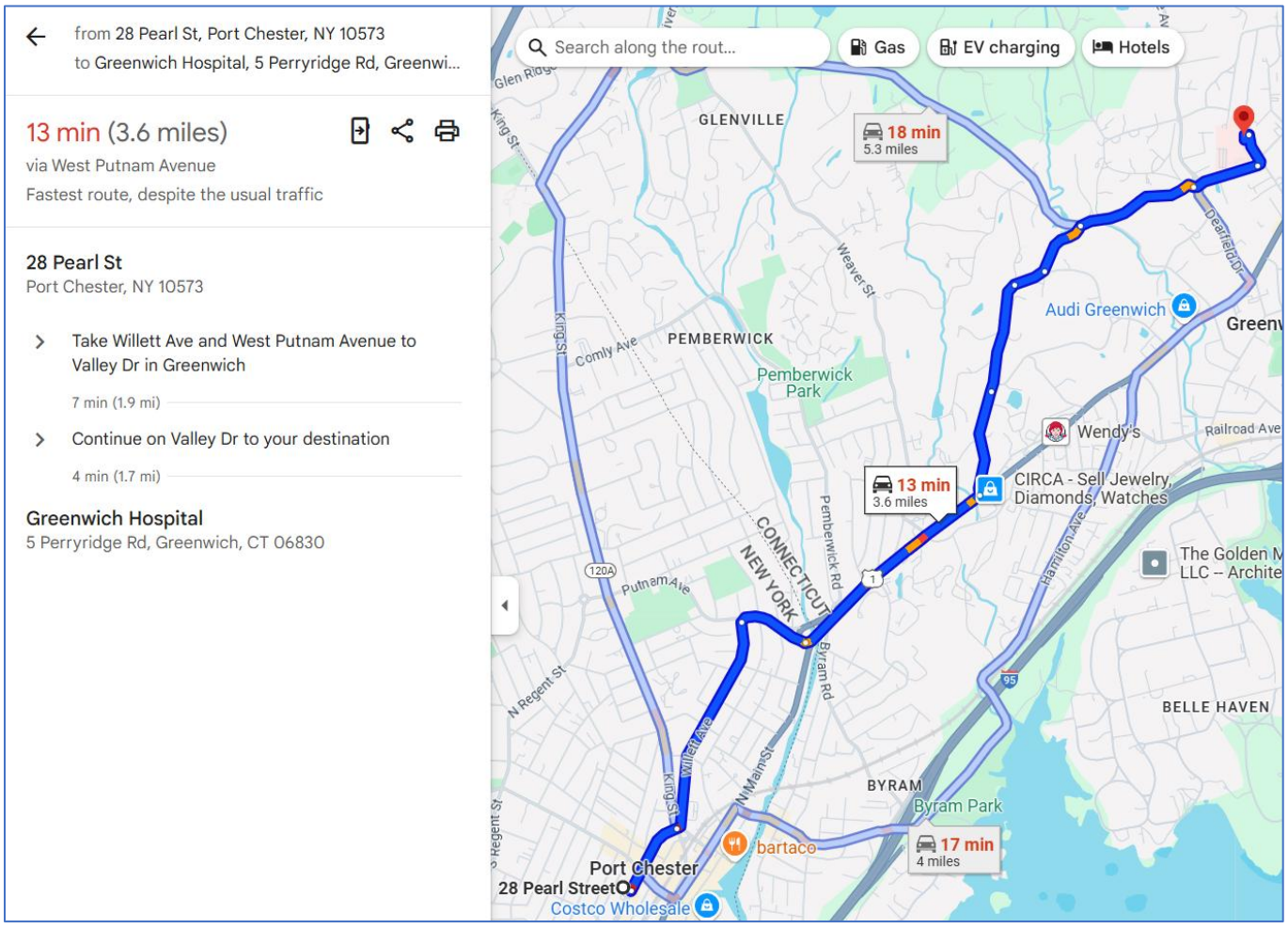
Greenwich Hospital

5 Perryridge Rd

Greenwich, CT 06830

(203) 863-3000

Figure 10.1: Directions to Hospital (Greenwich Hospital)



11.0 LOGS, REPORTS, AND RECORDKEEPING

11.1 HASP AND FIELD CHANGE REPORT

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject Site.

11.2 MEDICAL AND TRAINING RECORDS

The HSM must obtain and keep a log of personnel meeting appropriate training and medical qualifications for the site work. The log will be kept in the project file. Each company's Human Resources Department will maintain medical records, in accordance with 29 CFR 1910.1020.

11.3 EXPOSURE RECORDS

Any personnel monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For SESI employees, the originals will be sent to the Human Resources Manager. For subcontractor employees, the original file will be sent to the subcontractor employer with a copy maintained in the SESI project file.

11.4 ACCIDENT/INCIDENT REPORT

Any accident/incident reports must be completed following procedures given in Section 10.5 of this HASP. The originals will be sent to the HSM for maintenance. A copy of the forms will be kept in the project file. (See Attachment 4)

11.5 OSHA FORM 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project Site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Human Resources Manager for maintenance. Subcontractor employees must also meet the requirements of maintaining an OSHA 200 Form. The accident/incident report meets the requirements of OSHA Form 101 (Supplemental Record), which must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

11.6 ON-SITE HEALTH AND SAFETY FIELD LOGBOOK

The HSM or designee will maintain an on-Site health and safety logbook in which daily Site conditions, activities, personnel, and significant events will be recorded. Calibration records and

personnel monitoring results, if available, will also be recorded in the field logbook. The original logbook will be kept in the project file.

Whenever any personnel monitoring is conducted onsite, the monitoring results will be noted in the filed logbook. These will become part of the exposure records file and will be maintained by the HSM.

A signatory page is included (See Attachment 5) and is to be signed by those working on and/or visiting the Site.

11.7 MATERIAL DATA SAFETY SHEETS

Material Safety Data Sheets (MSDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, use, or stored at the Site (See Attachment 6).

12.0 COVID RESPONSE ACTION PLAN

SESI is concerned with the safety and well-being of its employees, vendors, subcontractors, and others with access to its offices and job sites, with particular emphasis on the unique challenges posed by COVID-19.

SESI has established the following protocols in keeping with the recommendations of the CDC and other sources including State Governor Executive Orders for work taking place on construction sites.

We request that all SESI employees, vendors, and subcontractors help with our prevention efforts while at work.

In order to minimize the spread of COVID-19, we must all cooperate in doing the following:

- Frequently wash your hands with soap and water for at least 20 seconds. When soap and running water are unavailable, use an alcohol-based hand rub with at least 60% alcohol. Always wash hands that are visibly soiled.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
- Discourage handshaking, avoid touching your eyes, nose, or mouth with unwashed hands.
- Limit the sharing of tools, machinery, equipment, phones, desks, and computers.
- Wear cloth face coverings on all construction sites.
- Avoid close contact with people who are sick.
- Employees who have symptoms (i.e., fever, cough, or shortness of breath) should notify their supervisor and stay home—DO NOT GO TO WORK.
- Sick employees should follow CDC-recommended steps. Employees should not return to work until the criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments.

The following are the specific jobsite protocols and response actions to be taken in the event someone on Site has been in contact with, or has themselves, the COVID-19 virus:

OFFICE/JOBSITE PROTOCOL

- If an employee/worker exhibits COVID-19 symptoms, the employee/worker must remain at home until he or she is symptom free for 72 hours (three [3] full days) without the use of fever-reducing or other symptom-altering medicines (e.g. acetaminophen, cough suppressants). SESI will similarly require an employee or worker that reports to work with symptoms to return home until they are symptom free for 72 hours (three [3] full days).
- Limit person to person contact, and when unavoidable, maintain CDC distancing guidelines.

- Avoid eating lunch in groups.
- Avoid in-person meetings if possible. If an in-person meeting is necessary, conduct it in a well-ventilated area with enough space for attendees to distance themselves from one another. Field jobsite meetings should be conducted in smaller group meetings (no more than five [5] persons when possible) versus one large meeting.
- Only workers necessary to the execution of the work should be at the jobsites. No non-essential visitors should be permitted at the worksite.

RESPONSE ACTION TRIGGER EVENTS:

- an employee/worker at work has tested positive for COVID-19
- an employee/worker at work has suspected, but unconfirmed, case of COVID-19
- an employee/worker self-reported that they came in contact with someone who had a presumptive positive case of COVID-19
- an employee/worker has been exposed to the virus but only found out after they have interacted with others

RESPONSE ACTIONS:

- Upon occurrence of any of the Trigger Events above, employees/subcontractors shall notify SESI Management about the suspected employee/worker infected with, or exposed to, COVID-19.
- SESI Management will investigate the incident to confirm the report is valid.
- Employees/Subcontractors shall investigate their respective infected employee(s) and report the following to SESI Management and HR:
    - Identify all individuals who worked in proximity (six feet) of the infected employee/worker,
    - Employee(s)/Worker(s) infected with the COVID-19 virus, and employee(s)/worker(s) that came in contact with the infected employee/worker shall be sent home for a period of 14 days,
    - Do not identify the infected employee/worker by name to avoid violation of privacy/confidentiality laws, and,
    - Keep SESI Management informed of progress and updates.

- If an infected person was in the office, SESI will clean and disinfect common areas and surfaces, in accordance with CDC recommendations.
- SESI Management will notify affected employees/workers of the Trigger Event and instruct them to take the response actions above.

- **SESI Management policy requires written documentation from a health care professional that confirmed infected employees can return to work.**

Except for circumstances in which SESI is legally required to report workplace occurrences of communicable disease, the confidentiality of all medical conditions will be maintained in accordance with applicable law and to the extent practical under the circumstances. When

required, the number of persons who will be informed of an employee's/worker's condition will be kept at the minimum needed to appropriately notify other potentially affected employees/workers of Trigger Events and to attempt to minimize the potential for transmission of the virus.

Attachment 1:
Air Monitor Log

Air Monitoring: Sample Collection and Analysis

Date & Time of Monitoring	Task / Operation Being	Substance(s)/ Hazard(s) Being	Monitoring Location	Type/Method of Monitoring (separate lines for	Monitoring Results	Exposure Limits	Required Action

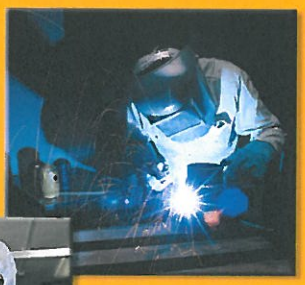
Attachment 2:
OSHA Poster

Job Safety and Health

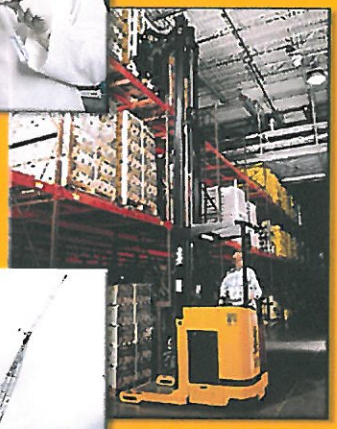
It's the law!

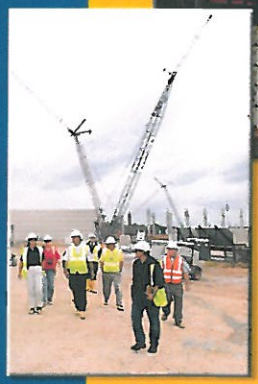
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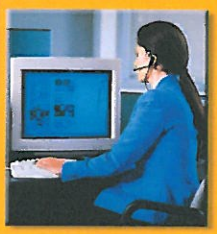
Occupational Safety and Health Administration
U.S. Department of Labor











EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3165-02 2012R

Attachment 3:
Field Change Request Form

HEALTH & SAFETY PLAN
CHANGE NOTICE

Pages _____ of _____

Project: H&S-CN

1) HASP VERSION: _____ SECTION: _____ PAGE (s): _____

RE: --- Change to existing HASP Anticipated Revision Date: _____
--- Addition to existing HASP
--- Other: _____
_____CONT._____

2) PROPOSED CHANGE: _____
_____
_____
_____

3) REASON FOR PROPOSED CHANGE(s):
--- Required by SPEC or Change Order --- Other: _____
--- Disposition of Deficiency _____CONT._____
--- Change in Regulatory or Other Requirements
--- Operational Experience

4) EXHIBITS ATTACHED ____ NO ____ YES (If YES, describe) _____
_____CONT._____

5) PMK APPROVALS PROJECT MANAGER: _____ Date: _____
SITE MANAGER: _____ Date: _____
H&S MANAGER: _____ Date: _____

Client Approval Required: ____ NO ____ YES (If YES, date submitted) _____

6) CLIENT APPROVAL _____ APPROVED _____ REMANDED _____ REJECTED

Comments: _____
_____
_____ CONT._____

Client Representative: _____Date: _____

7) DISTRIBUTION AFTER APPROVAL

X HASP UPDATE LIST --- OTHER: _____
X CLIENT _____
X PROJECT FILES _____

8) PREPARED BY: _____Date: _____
Title: _____

Attachment 4:
Injury Report Form

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____)_____-_____ Date ____/ ____/ ____

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ____/ ____/ ____

4) Date hired ____/ ____/ ____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ____/ ____/ ____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ____/ ____/ ____

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case (CHECK ONLY ONE box for each case based on the most serious outcome for that case:)				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:					
								Remained at Work				(M)					
(A) Case no.	(B) Employee's name	(C) Job title (*e.g., Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other recordable cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
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Page totals ➤						____	____	____	____	____	____	____	____	____	____	____	____

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Injury (1) Skin disorder (2) Respiratory condition (3) Poisoning (4) Hearing loss (5) All other illnesses (6)

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .	(M)		
(1) Injuries	_____	(4) Poisonings	_____
		(5) Hearing loss	_____
(2) Skin disorders	_____	(6) All other illnesses	_____
(3) Respiratory conditions	_____		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., 3715*)

__ __ __ __

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

__ __ __ __ __ __

Employment information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

Attachment 5:
Signatory Page

Attachment 4 – Site-Specific Health and Safety Orientation Signatory Page
HEALTH AND SAFETY PLAN

Title	Name	Signature
Project Manager:	TBD	
Health and Safety Manager:	TBD	

I have read the attached Health and Safety Plan (HASP) and have received site-specific information and orientation regarding the identified physical, chemical, and biological hazards anticipated at this site. My signature certifies that I understand the procedures, equipment, and restrictions applicable to this project site and agree to abide by them.

Signature	Printed Name	Company	Date

Attachment 4 – Health and Safety Orientation Signatory Page (continued)

Signature	Printed Name	Company	Date

Attachment 6
Safety Data Sheets

SAFETY DATA SHEET

Version 6.6
Revision Date 02/07/2023
Print Date 02/15/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,2,3-Trichloropropane

Product Number : 110124
Brand : Aldrich
Index-No. : 602-062-00-X
CAS-No. : 96-18-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 4), H227
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 1B), H360
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Kidney, Liver, Mucous membranes, H372
Short-term (acute) aquatic hazard (Category 3), H402
Long-term (chronic) aquatic hazard (Category 3), H412

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard statement(s)

H227	Combustible liquid.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H319	Causes serious eye irritation.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs (Kidney, Liver, Mucous membranes) through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of water.Call a POISON CENTER/ doctor if you feel unwell.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

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SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	$C_3H_5Cl_3$
Molecular weight	:	147.43 g/mol
CAS-No.	:	96-18-4
EC-No.	:	202-486-1
Index-No.	:	602-062-00-X

Component	Classification	Concentration
1,2,3-Trichloropropane		
	Flam. Liq. 4; Acute Tox. 3; Eye Irrit. 2A; Muta. 2; Carc. 1B; Repr. 1B; STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; H227, H301, H331, H311, H319, H341, H350, H360, H372, H402, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Hydrogen chloride gas
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

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Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,2,3-Trichloropropane	96-18-4	TWA	0.005 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Suspected human carcinogen		
		TWA	10 ppm 60 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen Potential for dermal absorption		
		TWA	50 ppm 300 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	10 ppm 60 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Body Protection
protective clothing

Respiratory protection
required when vapours/aerosols are generated.

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Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Color: colorless
b)	Odor	pungent
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-14.0 °C (6.8 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	74 °C (165 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 12.6 %(V) Lower explosion limit: 3.2 %(V)
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	1.387 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SECTION 10: Stability and reactivity

10.1 Reactivity
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 120 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - > 4.8 mg/l - vapor

(OECD Test Guideline 403)
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, After a latency period:, Lung edema
LD50 Dermal - Rabbit - male and female - 523 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 24 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Does not cause skin sensitization.
(OECD Test Guideline 406)

Germ cell mutagenicity
Suspected of causing genetic defects.
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation

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Method: OECD Test Guideline 471
Result: positive

Carcinogenicity
Presumed to have carcinogenic potential for humans

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,2,3-Trichloropropane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,2,3-Trichloropropane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
May damage the unborn child.
May damage fertility.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Inhalation - Causes damage to organs through prolonged or repeated exposure.
- Kidney, Liver, Mucous membranes
Ingestion, Skin contact - May cause damage to organs through prolonged or repeated exposure.
- Kidney, Liver

Aspiration hazard
No data available

11.2 Additional Information

RTECS: TZ9275000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

The following applies to aliphatic halogenated hydrocarbons in general: systemic effect: narcosis, cardiovascular disorders. Toxic effect on liver, kidneys.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Pancreas. -

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 66.5 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - ca. 20 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata (green algae) - 49.6 mg/l - 72 h

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(OECD Test Guideline 201)

Toxicity to bacteria	static test IC50 - Bacteria - 30 mg/l - 24 h (ISO 9509)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test EC10 - Daphnia magna (Water flea) - 6 mg/l - 21 d (OECD Test Guideline 211)

12.2 Persistence and degradability

Biodegradability: aerobic - Exposure time 28 d
Result: 0 % - Not readily biodegradable.
(OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation: Cyprinus carpio (Carp) - 6 Weeks
(1,2,3-Trichloropropane)

Bioconcentration factor (BCF): 5.3 - 13
(OECD Test Guideline 305)

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 2810 Class: 6.1 Packing group: III
Proper shipping name: Toxic, liquids, organic, n.o.s. (1,2,3-Trichloropropane)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG

UN number: 2810 Class: 6.1 Packing group: III EMS-No: F-A, S-A

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Proper shipping name: TOXIC LIQUID, ORGANIC, N.O.S. (1,2,3-Trichloropropane)
Marine pollutant : yes

IATA
UN number: 2810 Class: 6.1 Packing group: III
Proper shipping name: Toxic liquid, organic, n.o.s. (1,2,3-Trichloropropane)

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,2,3-Trichloropropane	96-18-4	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,2,3-Trichloropropane	96-18-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,2,3-Trichloropropane	96-18-4	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.1,2,3-Trichloropropane	96-18-4	2007-09-28

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.6 Revision Date: 02/07/2023 Print Date: 02/15/2023

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SAFETY DATA SHEET

Version 6.6
Revision Date 08/27/2023
Print Date 01/07/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,2,4,5-Tetramethylbenzene

Product Number : T19607
Brand : Aldrich
CAS-No. : 95-93-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable solids (Category 1), H228
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

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Hazard statement(s)

H228	Flammable solid.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : Durene
1,2,4,5-Tetramethylbenzene

Formula : $C_{10}H_{14}$
Molecular weight : 134.22 g/mol
CAS-No. : 95-93-2
EC-No. : 202-465-7

Component	Classification	Concentration
1,2,4,5-tetramethylbenzene		
	Flam. Sol. 1; Aquatic Acute 1; Aquatic Chronic 1; H228, H400, H410 M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Change contaminated clothing. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Keep away from heat and sources of ignition.

Storage class

Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact

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Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter type P1
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystals
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 76 - 80 °C (169 - 176 °F) - lit.
f)	Initial boiling point and boiling range	191 - 193 °C 376 - 379 °F
g)	Flash point	74 °C (165 °F) - c.c.
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 1.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	0.838 g/mL at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient:	No data available

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	n-octanol/water	
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Oxidizing agents

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 6,700 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

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Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: DC0500000
The data available to us do not suffice to permit any industrial-toxicological assessment.

Further toxicological data:

Risk of absorption.

Other dangerous properties can not be excluded.

Further data:

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	LC0 - Leuciscus idus (Golden orfe) - 10 mg/l - 48 h Remarks: (ECOTOX Database)
	LC50 - Leuciscus idus (Golden orfe) - 30 mg/l - 48 h Remarks: (ECOTOX Database)

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	LC100 - Leuciscus idus (Golden orfe) - 50 mg/l - 48 h Remarks: (ECOTOX Database)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.47 mg/l - 48 h Remarks: (External MSDS)

12.2 Persistence and degradability
Not readily biodegradable.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 1325 Class: 4.1 Packing group: II
Proper shipping name: Flammable solids, organic, n.o.s. (1,2,4,5-tetramethylbenzene)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 1325 Class: 4.1 Packing group: II EMS-No: F-A, S-G
Proper shipping name: FLAMMABLE SOLID, ORGANIC, N.O.S. (1,2,4,5-tetramethylbenzene)
Marine pollutant : yes

IATA
UN number: 1325 Class: 4.1 Packing group: II

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Proper shipping name: Flammable solid, organic, n.o.s. (1,2,4,5-tetramethylbenzene)

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.6 Revision Date: 08/27/2023 Print Date: 01/07/2024

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SAFETY DATA SHEET

Version 6.6
Revision Date 12/07/2023
Print Date 01/28/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,2,4-Trimethylbenzene

Product Number : T73601
Brand : Aldrich
Index-No. : 601-043-00-3
CAS-No. : 95-63-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 3), H226
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

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2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard Statements

H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H411	Toxic to aquatic life with long lasting effects.

Precautionary Statements

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

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SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_9H_{12}
Molecular weight	:	120.19 g/mol
CAS-No.	:	95-63-6
EC-No.	:	202-436-9
Index-No.	:	601-043-00-3

Component	Classification	Concentration
1,2,4-Trimethylbenzene		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H226, H332, H315, H319, H335, H304, H401, H411	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Consult a physician. Show this material safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,2,4-Trimethylbenzene	95-63-6	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		
		TWA	25 ppm 125 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	25 ppm 125 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm

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Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 30 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Color: colorless
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-43.7 °C (-46.7 °F)
f)	Initial boiling point and boiling range	168.0 - 169.0 °C 334.4 - 336.2 °F
g)	Flash point	48.0 °C (118.4 °F) - closed cup
h)	Evaporation rate	No data available

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i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 6.4 %(V) Lower explosion limit: 0.9 %(V)
k)	Vapor pressure	2.3 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	No data available
m)	Density	0.88 g/cm3
	Relative density	No data available
n)	Water solubility	0.057 g/l at 25 °C (77 °F) - slightly soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	515.0 °C (959.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 6,000 mg/kg
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Remarks: No data available

Serious eye damage/eye irritation
Remarks: No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: in vitro test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: In vivo micronucleus test
Species: Rat
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: Mutagenicity (micronucleus test)
Result: negative

Carcinogenicity

IARC:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

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11.2 Additional Information

RTECS: DC3325000
prolonged or repeated exposure can cause:, narcosis, Bronchitis., Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Central nervous system -

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 7.72 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 3.6 mg/l - 48 h (OECD Test Guideline 202)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in

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igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3295 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: HYDROCARBONS, LIQUID, N.O.S.

IATA
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

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1,2,4-Trimethylbenzene	CAS-No. 95-63-6	Revision Date 2007-07-01

New Jersey Right To Know Components

1,2,4-Trimethylbenzene	CAS-No. 95-63-6	Revision Date 2007-07-01

SECTION 16: Other information

Further information

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The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.6 Revision Date: 12/07/2023 Print Date: 01/28/2024

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1,2-Dichlorobenzene

Apollo Scientific

Chemwatch Hazard Alert Code: **2**

Part Number: **OR8794**
Version No: **2.2**
Safety Data Sheet

Issue Date: **04/07/2023**
Print Date: **04/07/2023**
S.GHS.GB-NIR.EN

SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	1,2-Dichlorobenzene
Chemical Name	1,2-dichlorobenzene
Synonyms	Not Available
Proper shipping name	o-DICHLOROBENZENE
Chemical formula	C6H4Cl2
Other means of identification	Not Available
CAS number	95-50-1*

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Not Available

Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Apollo Scientific**	**Apollo Scientific ltd**
Address	Whitefield Road, Bredbury SK62QR United Kingdom	Whitefield Road, Bredbury Cheshire SK6 2QR United Kingdom (NI)
Telephone	01614060505	+44(0) 161 406 0505
Fax	0161 406 0506	Not Available
Website	http://www.apolloscientific.co.uk/	apolloscientific.co.uk
Email	sales@apolloscientific.co.uk	sales@apolloscientific.co.uk

Emergency telephone number

Association / Organisation	**Not Available**
Emergency telephone numbers	Not Available
Other emergency telephone numbers	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Classification according to regulation (EC) No 1272/2008 [CLP] and	H400 - Hazardous to the Aquatic Environment Acute Hazard Category 1, H335 - Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, H302 - Acute Toxicity (Oral) Category 4, H315 - Skin Corrosion/Irritation Category 2, H319 - Serious Eye Damage/Eye Irritation Category 2, H410 - Hazardous to the Aquatic Environment Long-Term Hazard

amendments [1]	Category 1
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Hazard pictogram(s)	
Signal word	**Warning**

Hazard statement(s)

H335	May cause respiratory irritation.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P271	Use only outdoors or in a well-ventilated area.
P261	Avoid breathing mist/vapours/spray.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves, protective clothing, eye protection and face protection.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P391	Collect spillage.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330	Rinse mouth.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

CAS No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	SCL / M-Factor
95-50-1*	100	1,2-Dichlorobenzene	Hazardous to the Aquatic Environment Acute Hazard Category 1, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3 , Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2, Hazardous to the Aquatic Environment Long-Term Hazard Category 1; H335, H302,	*

CAS No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	SCL / M-Factor
			H315, H319, H410 [1]	

Legend: *1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; * EU IOELVs available; [e] Substance identified as having endocrine disrupting properties*

Mixtures

See section above for composition of Substances

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Wash out immediately with fresh running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor.
Ingestion	▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

Indication of any immediate medical attention and special treatment needed

As in all cases of suspected poisoning, follow the ABCDEs of emergency medicine (airway, breathing, circulation, disability, exposure), then the ABCDEs of toxicology (antidotes, basics, change absorption, change distribution, change elimination).
For poisons (where specific treatment regime is absent):

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 L/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- **DO NOT** use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

SECTION 5 Firefighting measures

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves in the event of a fire. - Prevent, by any means available, spillage from entering drains or water courses. - Use fire fighting procedures suitable for surrounding area. - **DO NOT** approach containers suspected to be hot. - Cool fire exposed containers with water spray from a protected location. - If safe to do so, remove containers from path of fire. - Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	- Non combustible. - Not considered a significant fire risk, however containers may burn. May emit poisonous fumes.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	- Clean up all spills immediately. - Avoid breathing vapours and contact with skin and eyes. - Control personal contact with the substance, by using protective equipment. - Contain and absorb spill with sand, earth, inert material or vermiculite. - Wipe up. - Place in a suitable, labelled container for waste disposal.
Major Spills	- Clear area of personnel and move upwind. - Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves. - Prevent, by any means available, spillage from entering drains or water course. - Stop leak if safe to do so. - Contain spill with sand, earth or vermiculite. - Collect recoverable product into labelled containers for recycling. - Neutralise/decontaminate residue (see Section 13 for specific agent). - Collect solid residues and seal in labelled drums for disposal. - Wash area and prevent runoff into drains. - After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. - If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	- Avoid all personal contact, including inhalation. - Wear protective clothing when risk of exposure occurs. - Use in a well-ventilated area. - Prevent concentration in hollows and sumps. - **DO NOT** enter confined spaces until atmosphere has been checked. - **DO NOT** allow material to contact humans, exposed food or food utensils.

	‣ Avoid contact with incompatible materials. ‣ When handling, **DO NOT** eat, drink or smoke. ‣ Keep containers securely sealed when not in use. ‣ Avoid physical damage to containers. ‣ Always wash hands with soap and water after handling. ‣ Work clothes should be laundered separately. Launder contaminated clothing before re-use. ‣ Use good occupational work practice. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS. ‣ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Other information	‣ Store in original containers. ‣ Keep containers securely sealed. ‣ Store in a cool, dry, well-ventilated area. ‣ Store away from incompatible materials and foodstuff containers. ‣ Protect containers against physical damage and check regularly for leaks. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	‣ Lined metal can, lined metal pail/ can. ‣ Plastic pail. ‣ Polyliner drum. ‣ Packing as recommended by manufacturer. ‣ Check all containers are clearly labelled and free from leaks. For low viscosity materials ‣ Drums and jerricans must be of the non-removable head type. ‣ Where a can is to be used as an inner package, the can must have a screwed enclosure. For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.): ‣ Removable head packaging; ‣ Cans with friction closures and ‣ low pressure tubes and cartridges may be used. - Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *. - In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *. - * unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.
Storage incompatibility	None known ‣ Light sensitive

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	1,2-Dichlorobenzene	1,2-Dichlorobenzene	20 ppm / 122 mg/m3	306 mg/m3 / 50 ppm	Not Available	Skin
UK Workplace Exposure Limits (WELs)	1,2-Dichlorobenzene	1,2-Dichlorobenzene (ortho-dichlorobenzene)	25 ppm / 153 mg/m3	306 mg/m3 / 50 ppm	Not Available	Sk

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
1,2-Dichlorobenzene	50 ppm	170 ppm	1,000 ppm

Ingredient	Original IDLH	Revised IDLH
1,2-Dichlorobenzene	200 ppm	Not Available

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Individual protection measures, such as personal protective equipment



Eye and face protection

- Safety glasses with side shields.
- Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent]
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

Skin protection

See Hand protection below

Hands/feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

	Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: · frequency and duration of contact, · chemical resistance of glove material, · glove thickness and · dexterity Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). · When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. · Contaminated gloves should be replaced. As defined in ASTM F-739-96 in any application, gloves are rated as: · Excellent when breakthrough time > 480 min · Good when breakthrough time > 20 min · Fair when breakthrough time < 20 min · Poor when glove material degrades For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: · Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. ‣ Wear chemical protective gloves, e.g. PVC. ‣ Wear safety footwear or safety gumboots, e.g. Rubber
Body protection	See Other protection below
Other protection	‣ Overalls. ‣ Eyewash unit. ‣ Barrier cream. ‣ Skin cleansing cream.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Not Available

Physical state	Liquid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	-18 to -17	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	178-180	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available

Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Not Available	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	‣ Unstable in the presence of incompatible materials. ‣ Product is considered stable. ‣ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	This material can cause eye irritation and damage in some persons.
Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

Acute Toxicity	✔	**Carcinogenicity**	✘
Skin Irritation/Corrosion	✔	**Reproductivity**	✘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✔
Respiratory or Skin sensitisation	✘	**STOT - Repeated Exposure**	✘
Mutagenicity	✘	**Aspiration Hazard**	✘

Legend: ✘ *– Data either not available or does not fill the criteria for classification*
✔ *– Data available to make classification*

SECTION 12 Ecological information

Toxicity

Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Very toxic to aquatic organisms.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
1,2-Dichlorobenzene	HIGH (Half-life = 360 days)	MEDIUM (Half-life = 63.67 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
1,2-Dichlorobenzene	LOW (BCF = 260)

Mobility in soil

Ingredient	Mobility
1,2-Dichlorobenzene	LOW (KOC = 443.1)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: ▸ Reduction ▸ Reuse ▸ Recycling ▸ Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. ▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority.

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	

Land transport (ADR-RID)

UN number or ID number	1591
UN proper shipping name	o-DICHLOROBENZENE

Transport hazard class(es)	Class: 6.1 Subsidiary risk: Not Applicable
Packing group	III
Environmental hazard	Environmentally hazardous
Special precautions for user	Hazard identification (Kemler): 60 Classification code: T1 Hazard Label: 6.1 Special provisions: 279 Limited quantity: 5 L Tunnel Restriction Code: 2 (E)

Air transport (ICAO-IATA / DGR)

UN number	1591
UN proper shipping name	o-Dichlorobenzene
Transport hazard class(es)	ICAO/IATA Class: 6.1 ICAO / IATA Subrisk: Not Applicable ERG Code: 6L
Packing group	III
Environmental hazard	Environmentally hazardous
Special precautions for user	Special provisions: A113 Cargo Only Packing Instructions: 663 Cargo Only Maximum Qty / Pack: 220 L Passenger and Cargo Packing Instructions: 655 Passenger and Cargo Maximum Qty / Pack: 60 L Passenger and Cargo Limited Quantity Packing Instructions: Y642 Passenger and Cargo Limited Maximum Qty / Pack: 2 L

Sea transport (IMDG-Code / GGVSee)

UN number	1591
UN proper shipping name	o-DICHLOROBENZENE
Transport hazard class(es)	IMDG Class: 6.1 IMDG Subrisk: Not Applicable
Packing group	III
Environmental hazard	Marine Pollutant
Special precautions for user	EMS Number: F-A, S-A Special provisions: 279 Limited Quantities: 5 L

Inland waterways transport (ADN)

UN number	1591
UN proper shipping name	o-DICHLOROBENZENE
Transport hazard class(es)	6.1 Not Applicable
Packing group	III
Environmental hazard	Environmentally hazardous
Special precautions for user	Classification code: T1 Special provisions: 279; 802

Limited quantity	5 L
Equipment required	PP, EP, TOX, A
Fire cones number	0

Transport in bulk according to Annex II of MARPOL and the IBC code

Product name	Pollution Category	Ship Type
Dichlorobenzene (all isomers)	X	2

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
1,2-Dichlorobenzene	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
1,2-Dichlorobenzene	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

1,2-Dichlorobenzene is found on the following regulatory lists

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances	European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI
Europe EC Inventory	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (1,2-Dichlorobenzene)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	04/07/2023
Initial Date	04/07/2023

SDS Version Summary

Version	Date of Update	Sections Updated
1.2	04/07/2023	Toxicological information - Acute Health (skin), Physical and chemical properties - Appearance, CAS Number, Ecological Information - Environmental, Firefighting measures - Fire Fighter (extinguishing media), Firefighting measures - Fire Fighter (fire/explosion hazard), Composition / information on ingredients - Ingredients, Korean MSDS Number, Accidental release measures - Spills (minor), Identification of the substance / mixture and of the company / undertaking - Supplier Information, Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.
For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
EN 166 Personal eye-protection
EN 340 Protective clothing
EN 374 Protective gloves against chemicals and micro-organisms
EN 13832 Footwear protecting against chemicals
EN 133 Respiratory protective devices

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	Classification Procedure
Hazardous to the Aquatic Environment Acute Hazard Category 1, H400	Calculation method

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	Classification Procedure
Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3 , H335	Expert judgement
Acute Toxicity (Oral) Category 4, H302	Expert judgement
Skin Corrosion/Irritation Category 2, H315	Expert judgement
Serious Eye Damage/Eye Irritation Category 2, H319	Expert judgement
Hazardous to the Aquatic Environment Long-Term Hazard Category 1, H410	Expert judgement

Powered by AuthorITe, from Chemwatch.

1.Identification

Product name:	1,2-Dichloroethane
Catalog#:	J61361
IUPAC name:	1,2-dichloroethanef
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Flammable liquids (Category 2)
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 3)
Skin irritation (Category 2)
Eye irritation (Category 2A)
Carcinogenicity (Category 1B)
Specific target organ toxicity - single exposure (Category 3), Respiratory system
Aspiration hazard (Category 1)

Pictogram(s)



Signal word:

Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H350	May cause cancer.

Precautionary statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
-	-
P301+P310	IF SWALLOWED: Immediately call a poison center or doctor.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340+P311	-
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF EXPOSED or concerned: Get medical advice/attention.
P331	Do NOT induce vomiting.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P370+P378	In case of fire: Use dry sand, dry chemical, CO2, water spray or alcohol-resistant foam for extinction.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	107-06-2
Purity:	98%
EC:	203-458-1

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.

Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.

Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.

Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.

Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.

Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Specific hazards arising from the chemical:

Carbon oxides, Hydrogen chloride.

Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.

Environmental precautions: Do not let product enter drains, other waterways, or soil.

Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.

Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition. ,Store long-term in a cool, dry place.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]

NIOSH REL: TWA 1 ppm (4 mg/m3) ST 2 ppm (8 mg/m3). See Appendix C (Chloroethanes). Potential Occupational Carci

ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes: Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.

Hands: Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.

Skin and body: Protective clothing must be selected based on the hazards present in the workplace, the

- physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.

Respiratory: Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Liquid
Molecular Formula:	C2H4Cl2
Molecular Weight:	98.96
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	83°C
Freezing/Melting Point:	-35°C
Flash Point:	13°C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	1.256 g/mL at 25 °C (lit.)
Refractive Index:	1.444 (lit.)
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides, Hydrogen chloride.

11. Toxicological Information

RTECS#	KI0525000
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Group2B - Probably carcinogenic to humans.
NTP:	Anticipated carcinogen.

OSHA: Not listed.
Acute toxic effects: Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity: Toxicity to Algae: EC50 Skeletonema costatum (Diatom)-443000 g/L-24h;Toxicity to Crustaceans: LC50 Americamysis bahia (Opossum Shrimp)-108000 g/L-24h
Persistence and degradability: Not available.
Bioaccumulative potential: Not available.
Mobility in soil: Not available.
Other adverse effects: Not available.

13. Disposal Considerations

Disposal of waste: Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging: Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number: UN1184
Proper shipping name: Ethylene dichloride
Transport hazard class: 3 (6.1);Flammable Liquid,Poison
Packing group: II

IATA

UN Number: UN1184
Proper shipping name: Ethylene dichloride
Transport hazard class: 3 (6.1);Flammable Liquid,Poison
Packing group: II

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65: WARNING: Attention California residents: This product can expose you to chemicals including 1,2-Dichloroethane, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov..

NFPA Rating:
Health: Not available.
Flammability: Not available.
Instability: Not available.

16. Additional Information

Version: 2
Revision Date: 11/11/2024

Printed Date: 11/11/2024

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

1.Identification

Product name:	1,3,5-Trimethylbenzene
Catalog#:	X8424
IUPAC name:	1,3,5-trimethylbenzenef
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Skin Corrosion/Irritation (Category 2)
Eye Damage/Irritation (Category 2B)
Specific Target Organ Toxicity (Single Exposure) (Category 3)
Aspiration Hazard (Category 1)
Flammable Liquids (Category 3)
Aquatic Hazard (Acute) (Category 2)
Aquatic Hazard (Long-Term) (Category 2)

Pictogram(s)



Signal word:

Danger!

Hazard statement(s)

H226	Flammable liquid and vapor.
H315	Causes skin irritation.
H320	Causes eye irritation.
H304	May be fatal if swallowed and enters airways.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s):

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310+P330	If swallowed: Immediately call a poison center or doctor. Rinse mouth.

P331	Do NOT induce vomiting.
P352	Wash with plenty of soap and water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a poison center or doctor if you feel unwell.
P351	Rinse cautiously with water for several minutes.
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P331	Do NOT induce vomiting.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use dry sand, dry chemical, CO2, water spray or alcohol-resistant foam for extinction.
P391	Collect spillage.
P403	Store in a well-ventilated place.
P233	Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	108-67-8
Purity:	99.5% (GC)
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.

Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.

Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.

Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.

Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.

Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Specific hazards arising from the chemical: Carbon oxides.

Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic

gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.

Environmental precautions: Do not let product enter drains, other waterways, or soil.

Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.

Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition. ,Store long-term in a cool, dry place.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: none
NIOSH REL: TWA 25 ppm (125 mg/m3)
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes:	Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.
Hands:	Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.
Skin and body:	Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.
Respiratory:	Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Colorless clear liquid
Molecular Formula:	C9H12
Molecular Weight:	120.19
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	164°C
Freezing/Melting Point:	Not available.
Flash Point:	50°C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Water: Insoluble (48.2mg/L, 25°C)
Relative Density:	0.865
Refractive Index:	1.5
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	OX6825000
Acute toxicity:	ihl-hmn TCLo:10 ppm;ihl-rat LC50:24000 mg/m3/4H ipr-gpg LDLo:1303 mg/kg;orl-rat LD50:5000 mg/kg;
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Toxicity to Fish: 48h LC50:8.6 ppm (Oryzias latipes);
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.

Mobility in soil: Not available.
Other adverse effects: Not available.

13. Disposal Considerations

Disposal of waste: Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.

Disposal of packaging: Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number:	UN2325
Proper shipping name:	1,3,5-Trimethylbenzene
Transport hazard class:	3;Flammable Liquid
Packing group:	III

IATA

UN Number:	UN2325
Proper shipping name:	1,3,5-Trimethylbenzene
Transport hazard class:	3;Flammable Liquid
Packing group:	III

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not Available..	
NFPA Rating:	Health:	2
	Flammability:	2
	Instability:	0

16. Additional Information

Revision Date: 09/14/2021
Printed Date: 09/14/2021

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Version 6.1
Revision Date 01/10/2020
Print Date 08/29/2020

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,3-Butadiene

Product Number : 295035
Brand : Aldrich
Index-No. : 601-013-00-X
CAS-No. : 106-99-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1A), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

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Hazard statement(s)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H340	May cause genetic defects.
H350	May cause cancer.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P405	Store locked up.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_4H_6
Molecular weight	:	54.09 g/mol
CAS-No.	:	106-99-0
EC-No.	:	203-450-8
Index-No.	:	601-013-00-X

Component	Classification	Concentration
1,3-Butadiene		
	Flam. Gas 1; Press. Gas Liquefied gas; Muta. 1B; Carc. 1A; H220, H280, H340, H350	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

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If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Clean up promptly by sweeping or vacuum.

6.4 Reference to other sections
For disposal see section 13.

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C

Contents under pressure. Air sensitive. Light sensitive. Shock or heat may detonate May explode when heated. Handle and store under inert gas.
Storage class (TRGS 510): 2A: Gases

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,3-Butadiene	106-99-0	TWA	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Cancer Suspected human carcinogen		
		TWA	1 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		
		STEL	5 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		
		See 1910.1051		
		Potential Occupational Carcinogen See Appendix A		
		PEL	1 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1051 This section applies to all occupational exposures to 1,3-Butadiene (BD), Chemical Abstracts Service Registry No. 106-99-0, except as provided in paragraph (a)(2) of this section. Except for the recordkeeping provisions in paragraph (m)(1) of this section, this section does not apply to the processing, use, or handling of products containing BD or to other work operations and streams in which BD is present where objective data are reasonably		

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		relied upon that demonstrate the work operation or the product or the group of products or operations to which it belongs may not reasonably be foreseen to release BD in airborne concentrations at or above the action level or in excess of the STEL under the expected conditions of processing, use, or handling that will cause the greatest possible release or in any plausible accident. This section also does not apply to work operations, products or streams where the only exposure to BD is from liquid mixtures containing 0.1% or less of BD by volume or the vapors released from such liquids, unless objective data become available that show that airborne concentrations generated by such mixtures can exceed the action level or STEL under reasonably predictable conditions of processing, use or handling that will cause the greatest possible release. Except for labeling requirements and requirements for emergency response, this section does not apply to the storage, transportation, distribution or sale of BD or liquid mixtures in intact containers or in transportation pipelines sealed in such a manner as to fully contain BD vapors or liquid. Where products or processes containing BD are exempted under paragraph (a)(2) of this section, the employer shall maintain records of the objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in paragraph (m)(1) of this section 1,3-Butadiene means an organic compound with chemical formula CH2=CH-CH=CH2 that has a molecular weight of approximately 54.15 g/mole OSHA specifically regulated carcinogen		
		STEL	5 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1051 This section applies to all occupational exposures to 1,3-Butadiene (BD), Chemical Abstracts Service Registry No. 106-99-0, except as provided in paragraph (a)(2) of this section. Except for the recordkeeping provisions in paragraph (m)(1) of this section, this section does not apply to the processing, use, or handling of products containing BD or to other work operations and streams in which BD is present where objective data are reasonably relied upon that demonstrate the work operation or the product or the group of products or operations to which it belongs may not reasonably be foreseen to release BD in airborne concentrations at or above the action level or in excess of the STEL under the expected conditions of processing, use, or handling that will cause the greatest possible release or in any plausible accident. This section also does not apply to work operations, products or streams where the only exposure to BD is from liquid mixtures containing 0.1% or less of BD by volume or the vapors released from such liquids, unless objective data become available that show that airborne concentrations generated by such mixtures can exceed the action level or STEL under reasonably predictable conditions of processing, use or		

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		handling that will cause the greatest possible release. Except for labeling requirements and requirements for emergency response, this section does not apply to the storage, transportation, distribution or sale of BD or liquid mixtures in intact containers or in transportation pipelines sealed in such a manner as to fully contain BD vapors or liquid. Where products or processes containing BD are exempted under paragraph (a)(2) of this section, the employer shall maintain records of the objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in paragraph (m)(1) of this section 1,3-Butadiene means an organic compound with chemical formula CH2=CH-CH=CH2 that has a molecular weight of approximately 54.15 g/mole OSHA specifically regulated carcinogen		
		PEL	1 ppm 2.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5201		
		STEL	5 ppm 11 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5201		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
1,3-Butadiene	106-99-0	1,2 Dihydroxy-4-(N-acetylcysteinyl)-butane	2.5 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Mixture of N-1 and N-2(hydroxybutenyl)valine	2.5picomoles per gram Hemoglobin	Hemoglobin (Hb) adducts in blood	ACGIH - Biological Exposure Indices (BEI)
		Not critical			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Liquefied gas
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available

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e)	Melting point/freezing point	Melting point/range: -109 °C (-164 °F) - lit.
f)	Initial boiling point and boiling range	-4.5 °C 23.9 °F - lit.
g)	Flash point	-76 °C (-105 °F) - closed cup - Tested according to Annex V of Directive 67/548/EEC.
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 16.3 %(V) Lower explosion limit: 1.4 %(V)
k)	Vapour pressure	ca.2,400 hPa at 20 °C (68 °F) 3,200 hPa at 30 °C(86 °F) 5,700 hPa at 50 °C(122 °F)
l)	Vapour density	No data available
m)	Relative density	0.62 g/cm3 at 20 °C (68 °F)
n)	Water solubility	0.5 g/l at 20 °C (68 °F) - Tested according to Annex V of Directive 67/548/EEC.
o)	Partition coefficient: n-octanol/water	log Pow: 1.85 at 23 °C (73 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Test for peroxide formation before using or discard after 3 months.
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Oxidizing agents, Oxygen, Copper, Copper alloys, Carbides, Halogens, Metal oxides, Metals

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10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,480 mg/kg
LC50 Inhalation - Rat - 4 h - 285 mg/l
Dermal: No data available
No data available

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

Germ cell mutagenicity
In vivo tests showed mutagenic effects

Carcinogenicity
This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Human carcinogen.

IARC:	1 - Group 1: Carcinogenic to humans (1,3-Butadiene)
NTP:	Known - Known to be human carcinogen (1,3-Butadiene)
OSHA:	OSHA specifically regulated carcinogen (1,3-Butadiene)

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure

Specific target organ toxicity - repeated exposure

Aspiration hazard

Additional Information
RTECS: Not available

Cholinesterase inhibitors can cause heavy salivation and secretion in the lungs, lachrymation, blurred vision, involuntary defecation, diarrhea, tremor, ataxia, sweating, hypothermia, lowered heart rate, and/or a fall in blood pressure as a result of their action at cholinergic nerve sites., narcosis, Headache, Nausea, Vomiting, Dizziness, Drowsiness, Confusion., Weakness, Muscle cramps/spasms., Change in pupil size., Tremors, Seizures., Incoordination., Convulsions, Coma

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

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SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	LC50 - other fish - 71.5 mg/l - 24 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 1010 Class: 2.1
Proper shipping name: Butadienes, stabilized
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1010 Class: 2.1 EMS-No: F-D, S-U
Proper shipping name: BUTADIENES, STABILIZED

IATA

UN number: 1010 Class: 2.1
Proper shipping name: Butadienes, stabilized
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	2007-07-01

SARA 311/312 Hazards

Fire Hazard, Sudden Release of Pressure Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.1,3-Butadiene	CAS-No. 106-99-0	Revision Date 2007-09-28
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.1,3-Butadiene	CAS-No. 106-99-0	Revision Date 2007-09-28

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1 Revision Date: 01/10/2020 Print Date: 08/29/2020

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SAFETY DATA SHEET

Version 6.9
Revision Date 12/07/2023
Print Date 01/27/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,4-Dichlorobenzene

Product Number : D56829
Brand : Aldrich
Index-No. : 602-035-00-2
CAS-No. : 106-46-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

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Pictogram	
Signal Word	Warning

Hazard Statements

H319	Causes serious eye irritation.
H351	Suspected of causing cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P264	Wash skin thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	$C_6H_4Cl_2$
Molecular weight	:	147.00 g/mol
CAS-No.	:	106-46-7
EC-No.	:	203-400-5
Index-No.	:	602-035-00-2

Component	Classification	Concentration
1,4-dichlorobenzene		
	Eye Irrit. 2A; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H319, H351, H400, H410 M-Factor - Aquatic Acute: 1	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Nature of decomposition products not known.
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry.

Storage class
Storage class (TRGS 510): 11: Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

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Component	CAS-No.	Value	Control parameters	Basis
1,4-dichlorobenzene	106-46-7	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen		
		TWA	75 ppm 450 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	10 ppm 60 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	200 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	110 ppm 675 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact

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Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter A-(P3)
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when dusts are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid Color: colorless
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/freezing point: 53.3 °C (127.9 °F)
f)	Initial boiling point and boiling range	174.1 °C 345.4 °F at 1,013 hPa
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	8.8 hPa at 50.0 °C (122.0 °F)
l)	Vapor density	No data available
m)	Density	1.46 g/cm3 at 20 °C (68 °F)
	Relative density	1.4620 °C
n)	Water solubility	82.9 mg/l at 25 °C (77 °F) - slightly soluble
o)	Partition coefficient:	log Pow: 3.37 at 25 °C (77 °F) - Bioaccumulation is not

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		n-octanol/water	expected.
p)		Autoignition temperature	> 500 °C (> 932 °F) Information taken from reference works and the literature.
q)		Decomposition temperature	No data available
r)		Viscosity	No data available
s)		Explosive properties	No data available
t)		Oxidizing properties	none

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Exothermic reaction with:
Alkali metals
Alkaline earth metals
Oxidizing agents
Nitric acid
Risk of explosion with:
Nitric acid
with
sulfuric acid

10.4 Conditions to avoid

no information available

10.5 Incompatible materials

Aluminum

10.6 Hazardous decomposition products

In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - > 5.07 mg/l - vapor

(OECD Test Guideline 403)
LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Remarks: Causes serious eye irritation.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Oral

Result: negative
Remarks: (ECHA)

Carcinogenicity
This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.
Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (1,4-dichlorobenzene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,4-dichlorobenzene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

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No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: CZ4550000
Produces:, methemoglobin, Nausea, Vomiting, Increased pulse rate, Headache, Impairment of vision
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Salmo gairdneri - 1.12 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 0.7 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 1.6 mg/l - 96 h (US-EPA)
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - Jordanella floridae - 0.2 - 0.23 mg/l - 14 d (OECD Test Guideline 210)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - Daphnia magna (Water flea) - 0.22 mg/l - 28 d Remarks: (ECHA)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 100 % - Readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation	Jordanella floridae - 5 d at 25 °C - 2.68 µg/l(1,4-dichlorobenzene) Bioconcentration factor (BCF): 296

12.4 Mobility in soil

No data available

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12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (1,4-dichlorobenzene)

Reportable Quantity (RQ): 100 lbs

Reportable Quantity (RQ): 100 lbs

Marine pollutant: yes Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,4-dichlorobenzene)

Marine pollutant : yes

Marine pollutant : no

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (1,4-dichlorobenzene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

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SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,4-dichlorobenzene	106-46-7	2020-07-14

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Reportable Quantity : D027 lbs

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,4-dichlorobenzene	106-46-7	2020-07-14

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,4-dichlorobenzene	106-46-7	2020-07-14

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.1,4-dichlorobenzene	106-46-7	2007-09-28

SECTION 16: Other information

Further information
The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.9 Revision Date: 12/07/2023 Print Date: 01/27/2024

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1.Identification

Product name:	1,4-Dioxane
Catalog#:	SOLVENT6
IUPAC name:	1,4-dioxane
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification

Flammable liquids (Category 2)
Eye irritation (Category 2A)
Carcinogenicity (Category 2)
Specific target organ toxicity - single exposure (Category 3), Respiratory system

Pictogram:



Signal word:

Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Precautionary statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340+P312	If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor if you feel unwell.

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF EXPOSED or concerned: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use dry sand, dry chemical, CO2, water spray or alcohol-resistant foam for extinction.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

May form explosive peroxides., Repeated exposure may cause skin dryness or cracking.

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	123-91-1
Purity:	Not available.
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.

Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.

Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.

Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.

Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.

Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Specific hazards arising from the chemical: Carbon oxides.

Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.

Environmental precautions: Do not let product enter drains, other waterways, or soil.

Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.

Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL:	Not available.
NIOSH REL:	Not available.
ACGIH TLV:	Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes:	Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.
Hands:	Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.
Skin and body:	Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.
Respiratory:	Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Pysical State:	Colorless clear liquid
Molecular Formula:	C4H8O2
Molecular Weight:	88.11
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	101°C
Freezing/Melting Point:	11°C
Flash Point:	12°C
Evaporation Rate:	Not available.

Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	1.03
Refractive Index:	1.42
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	Not available.
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT(United States)

UN number:	UN1165
Proper shipping name:	Dioxane(1,4-Dioxane)
Transport hazard class:	3
Packing group:	II

IATA

UN Number:	UN1165
Proper shipping name:	Dioxane(1,4-Dioxane)
Transport hazard class:	3
Packing group:	II

15. Regulatory Information

TSCA Chemical Inventory:

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not listed.	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 02/25/2019

Printed Date: 3/28/2019

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Creation Date 22-Jun-2009 **Revision Date** 28-Dec-2021 **Revision Number** 6

1. Identification

Product Name **2,2,4-Trimethylpentane**

Cat No. : **AC610210000, AC610210040; AC610210000; AC610210040**

CAS No 540-84-1
Synonyms Isooctane

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Aspiration Toxicity	Category 1

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor

May be fatal if swallowed and enters airways
Causes skin irritation
Causes serious eye irritation
May cause drowsiness or dizziness



Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Keep cool
Response
Get medical attention/advice if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
If skin irritation occurs: Get medical advice/attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Isooctane	540-84-1	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur. Risk of serious damage to the lungs (by aspiration).

Ingestion Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.

Most important symptoms and effects None reasonably foreseeable. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

Unsuitable Extinguishing Media Water may be ineffective, Do not use a solid water stream as it may scatter and spread fire

Flash Point -12 °C / 10.4 °F

Method - No information available

Autoignition Temperature 410 °C / 770 °F

Explosion Limits

Upper 6.0 vol %

Lower 1.1 vol %

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air. Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products

Carbon monoxide (CO). Carbon dioxide (CO_2).

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
3	3	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Storage. Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place. Flammables area. Keep away from heat, sparks and flame. Incompatible Materials. Strong oxidizing agents. Strong acids. Strong bases.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Isooctane	TWA: 300 ppm			TWA: 300 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Use only under a chemical fume hood. Use explosion-proof electrical/ventilating/lighting equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Petroleum distillates
Odor Threshold	No information available
pH	Not applicable
Melting Point/Range	-107 °C / -160.6 °F
Boiling Point/Range	98 - 99 °C / 208.4 - 210.2 °F @ 760 mmHg
Flash Point	-12 °C / 10.4 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable

Flammability or explosive limits	
Upper	6.0 vol %
Lower	1.1 vol %
Vapor Pressure	51 mbar @ 20 °C
Vapor Density	3.94
Specific Gravity	0.690
Solubility	Immiscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	410 °C / 770 °F
Decomposition Temperature	No information available
Viscosity	0.51 mPa s at 22 °C
Molecular Formula	C8 H18
Molecular Weight	114.23

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Heat, flames and sparks. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents, Strong acids, Strong bases

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Isooctane	LD50 5000 mg/kg (Rat)	2000 mg/kg (Rabbit)	LC50 = 33.52 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Isooctane	540-84-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Isooctane	EC50= 2.94 mg/l, 72h	LC50 = 0.11 mg/l, 96h, (Rainbow trout)	Not listed	EC50= 0.4 mg/l, 48h (Daphnia magna)

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available. Immiscible with water

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility. Is not likely mobile in the environment due its low water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1262
Proper Shipping Name OCTANES
Hazard Class 3
Packing Group II

TDG

UN-No UN1262
Proper Shipping Name OCTANES
Hazard Class 3
Packing Group II

IATA

UN-No UN1262
Proper Shipping Name OCTANES
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No UN1262
Proper Shipping Name OCTANES
Hazard Class 3
Packing Group II

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification -	TSCA - EPA Regulatory

			Active-Inactive	Flags
Isooctane	540-84-1	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Isooctane	540-84-1	X	-	208-759-1	X	X	X	X	X	KE-34634

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Isooctane	X		-

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Isooctane	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Isooctane	X	X	X	X	-

U.S. Department of Transportation
Reportable Quantity (RQ): Y
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade Serious risk, Grade 3

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Isooctane	-	Use restricted. See item 75. (see link for restriction details)	-

https://echa.europa.eu/substances-restricted-under-reach

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Isooctane	540-84-1	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Isooctane	540-84-1	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By
Regulatory Affairs
Acros Organics BVBA
Tel: 800-ACROS-01

Creation Date 22-Jun-2009
Revision Date 28-Dec-2021
Print Date 28-Dec-2021
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

1.Identification

Product name:	2,4-Dimethylphenol
Catalog#:	J99490
IUPAC name:	2,4-Dimethylphenol
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Acute toxicity, Oral (Category 3)
Acute toxicity, Dermal (Category 3)
Skin corrosion (Category 1B)
Serious eye damage (Category 1)
Acute aquatic toxicity (Category 2)

Pictogram(s)



Signal word:

Danger

Hazard statement(s)

H301+H311	-
H314	Causes severe skin burns and eye damage.
H401	Toxic to aquatic life.

Precautionary statement(s):

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310	IF SWALLOWED: Immediately call a poison center or doctor.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a poison center or doctor.
P322	Specific measures (see supplemental first aid instructions on this label).
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.

P501 Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:
None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	105-67-9
Purity:	95%
EC:	203-321-6

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.
Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.
Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.
Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.
Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.
Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Specific hazards arising from the chemical: Carbon oxides.
Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.
Environmental precautions: Do not let product enter drains, other waterways, or soil.
Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust

generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.

Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL:	Not available.
NIOSH REL:	Not available.
ACGIH TLV:	Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes:	Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.
Hands:	Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.
Skin and body:	Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.
Respiratory:	Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Colorless to yellow clear liquid
Molecular Formula:	C8H10O
Molecular Weight:	122.16
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	211°C
Freezing/Melting Point:	21-23°C
Flash Point:	96°C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	1.027
Refractive Index:	1.5375-1.5405
Volatility:	Not available.
Auto-ignition Temperature:	Not available.

Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	Not available.
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Toxicity to Fish: EC50 Gadus morhua (Atlantic Cod)-3700 g/L-4d;Toxicity to Invertebrates: EC50 Strongylocentrotus droebachiensis (Green Sea Urchin)-5100 g/L-4d
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number:	UN2261
Proper shipping name:	Xylenols, solid
Transport hazard class:	6.1;Poison
Packing group:	II

IATA

UN Number:	UN2261
Proper shipping name:	Xylenols, solid
Transport hazard class:	6.1;Poison
Packing group:	II

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not Available..	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 02/25/2019
Printed Date: 02/14/2020

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 2 Reviewed on 03/24/2019

*

1 Identification

· **Product identifier**

· **Trade name: 2-Butanone (MEK)**

· **Part number:** RCC-205
· **CAS Number:**
78-93-3
· **EC number:**
201-159-0
· **Index number:**
606-002-00-3
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
butanone
· **Hazard statements**
Highly flammable liquid and vapor.
Causes serious eye irritation.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: 2-Butanone (MEK)

(Contd. of page 1)

May cause drowsiness or dizziness.

· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a poison center/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
78-93-3 butanone
· **Identification number(s)**
· **EC number:** 201-159-0
· **Index number:** 606-002-00-3

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
200 ppm
· **PAC-2:**
2700* ppm
· **PAC-3:**
4000* ppm

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
78-93-3 butanone	
PEL	Long-term value: 590 mg/m³, 200 ppm
REL	Short-term value: 885 mg/m³, 300 ppm Long-term value: 590 mg/m³, 200 ppm
TLV	Short-term value: 885 mg/m³, 300 ppm Long-term value: 590 mg/m³, 200 ppm BEI

· **Ingredients with biological limit values:**	
78-93-3 butanone	
BEI	2 mg/L Medium: urine Time: end of shift Parameter: MEK

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not

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(Contd. of page 4)

needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Pleasant
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-87 °C (-124.6 °F)
Boiling point/Boiling range:	90 °C (194 °F)
· **Flash point:**	-3 °C (26.6 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	514 °C (957.2 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	1.8 Vol %
Upper:	11.5 Vol %

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· **Vapor pressure at 20 °C (68 °F):**	95 hPa (71.3 mm Hg)
· **Density at 20 °C (68 °F):**	0.8 g/cm³ (6.676 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with Water at 20 °C (68 °F):**	290 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 20 °C (68 °F):	0.4 mPas
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 800.0 g/l / 6.68 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,737 mg/kg (rat)

78-93-3 butanone		
Oral	LD50	2,737 mg/kg (rat)
Dermal	LD50	6,480 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.

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· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **NTP (National Toxicology Program)**
Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1193

· **UN proper shipping name**	
· **DOT**	Ethyl methyl ketone
· **IMDG, IATA**	ETHYL METHYL KETONE (METHYL ETHYL KETONE)

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· **Transport hazard class(es)**

· **DOT, IMDG, IATA**



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	F-E,S-D
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	5000 lbs, 2270 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1193 ETHYL METHYL KETONE (METHYL ETHYL KETONE), 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

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Trade name: 2-Butanone (MEK)

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· **Proposition 65**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

· **Chemicals known to cause developmental toxicity:**

Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

I

· **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
OSHA HCS2012

Revision date 13-Jun-2024 **Revision Number** 1

1. Identification

Product identifier

Product Name 2-Methylphenol

Other means of identification

Product Code(s) DRE-CA15140200

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended use This product is for research and development only

Restrictions on use Not to be used for human or animal consumption

Details of the supplier of the safety data sheet

Supplier Address

VHG
LGC Standards
276 Abby Road
Manchester, NH 03103
UNITED STATES OF AMERICA

Tel :+1 (603) 622-7660
Fax : +1 (603) 622-5180
Email : lgcusa@lgcgroup.com

Web : lgcstandards.com

E-mail sds-request@lgcgroup.com

Emergency telephone number

Emergency Telephone
For Hazardous Materials or Dangerous Goods Incident
Spill, Leak, Fire Exposure, or Accident
Call CHEMTREC:
USA & Canada 1-800-424-9300
Rest of the world +1 703-741-5970

2. Hazard(s) identification

Classification

Classified according to OSHA.

Acute toxicity - Oral	Category 3
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Vapors)	Category 1
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Chronic aquatic toxicity	Category 3
Flammable liquids	Category 4

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Danger

Hazard statements

Classified according to OSHA.
Toxic if swallowed
Toxic in contact with skin
Fatal if inhaled
Causes severe skin burns and eye damage
Harmful to aquatic life with long lasting effects
Combustible liquid



Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear respiratory protection
Wear protective gloves/clothing and eye/face protection
Keep away from flames and hot surfaces. - No smoking
Keep cool

Precautionary Statements - Response
Immediately call a POISON CENTER or doctor
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor
Call a POISON CENTER or doctor if you feel unwell
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
Wash contaminated clothing before reuse
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Immediately call a POISON CENTER or doctor
IF SWALLOWED: Immediately call a POISON CENTER or doctor
Rinse mouth
Do NOT induce vomiting
In case of fire: Use CO2, dry chemical, or foam to extinguish

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other information
Toxic to aquatic life.

3. Composition/information on ingredients

Substance

Formula C7H8O

Chemical name	CAS No.	Weight-%	Trade secret
o-Cresol	95-48-7	100	*

4. First-aid measures

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Inhalation If breathing has stopped, give artificial respiration. Get medical attention immediately. Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical attention.

Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention.
Ingestion	Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Self-protection of the first aider	Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Do not breathe vapor or mist. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms	Coughing and/ or wheezing. Difficulty in breathing. Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. Fire-fighting measures

Suitable Extinguishing Media **Large Fire**	Dry chemical. Carbon dioxide (CO_2). Water spray. Alcohol resistant foam. CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.
Specific hazards arising from the chemical	Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
Explosion data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	Yes.
Special protective equipment and precautions for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Take precautionary measures against static discharges. Do not touch or walk through spilled material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not breathe vapor or mist. Keep people away from and upwind of spill/leak. Attention! Corrosive material.

Other information Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Do not touch or walk through spilled material. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Use personal protection equipment. Do not breathe vapor or mist. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Take off contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Please refer to the manufacturer's certificate for specific storage and transport temperature conditions. Store only in the original receptacle unless other advice is given on the CoA. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labeled containers. Store in accordance with the particular national regulations. Store in accordance with local regulations. Keep out of the reach of children. Store locked up. Protect from moisture. Store away from other materials.

8. Exposure controls/personal protection

Control parameters

Exposure Limits

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
o-Cresol 95-48-7	TWA: 20 mg/m³ inhalable fraction and vapor Sk*	TWA: 5 ppm TWA: 22 mg/m³ (vacated) TWA: 5 ppm (vacated) TWA: 22 mg/m³ (vacated) Sk* Sk* all isomers	IDLH: 250 ppm TWA: 2.3 ppm TWA: 10 mg/m³

Biological occupational exposure limits
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering controls
Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection
Avoid contact with eyes. Wear safety glasses with side shields (or goggles). Tight sealing safety goggles. Face protection shield.

Hand protection
Wear suitable gloves. Impervious gloves. The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
	Wear protective butyl rubber gloves	0.5 mm	8 hours
	Wear protective Viton™ gloves	0.4 mm	8 hours
	Polyvinyl chloride (PVC)	0.5 mm	2 hours

Skin and body protection
Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

Respiratory protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Environmental exposure controls
Do not allow into any sewer, on the ground or into any body of water.

General hygiene considerations	Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Wear suitable gloves and eye/face protection. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Do not breathe vapor or mist.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Liquid
Color	brown
Odor	Phenols
Odor threshold	No information available

Property	**Values**	**Remarks • Method**
pH	No data available	None known
Melting point / freezing point	31 °C / 87.8 °F	None known
Initial boiling point and boiling range	191 °C / 375.8 °F	None known
Flash point	81 °C / 177.8 °F	None known
Evaporation rate	No data available	None known
Flammability	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	1.63 %vol ; 58 g/m^3	
Vapor pressure	0.24 hPa	@ 20°C
Relative vapor density	3.7	None known
Relative density	1.05	@ 20 °C
Water solubility		@ 20 °C
Solubility(ies)	No data available	None known
Partition coefficient	1.98	None known
Autoignition temperature	555 °C / 1031 °F	None known
Decomposition temperature		None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known

Other information

Explosive properties	No information available
Oxidizing properties	No information available
Softening point	No information available
Molecular weight	108.14
VOC content	No information available
Liquid Density	No information available
Bulk density	No information available

10. Stability and reactivity

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Heat, flames and sparks. Excessive heat. Exposure to air or moisture over prolonged periods.
Incompatible materials	Acids. Bases. Oxidizing agent.
Hazardous decomposition products	None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Product Information

Inhalation	Specific test data for the substance or mixture is not available. Fatal if inhaled. (based on components). Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.
Eye contact	Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components). Corrosive to the eyes and may cause severe damage including blindness. May cause irreversible damage to eyes.
Skin contact	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. Toxic in contact with skin.
Ingestion	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms	Coughing and/ or wheezing. Difficulty in breathing. Redness. Burning. May cause blindness.

Acute toxicity

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
o-Cresol 95-48-7	= 121 mg/kg (Rat)	= 890 mg/kg (Rabbit)	0.029 mg/l (Rat, 4h)

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes serious eye damage. Causes burns.

Respiratory or skin sensitization No information available.

Germ cell mutagenicity No information available.

Carcinogenicity No information available.

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Target organ effects Liver, Kidney, Respiratory system, Eyes, Skin, Central nervous system, Central Vascular System (CVS), Pancreas.

Aspiration hazard No information available.

Other adverse effects No information available.

Interactive effects No information available.

12. Ecological information

Ecotoxicity Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
o-Cresol 95-48-7	EC50: =65mg/L (96h, Pseudokirchneriella subcapitata)	LC50: 9.72 - 15.92mg/L (96h, Pimephales promelas) LC50: =24mg/L (96h, Brachydanio rerio) LC50: =11.5mg/L (96h, Lepomis macrochirus) LC50: 18.37 - 24.21mg/L (96h, Lepomis macrochirus) LC50: =8.4mg/L (96h, Oncorhynchus mykiss) LC50: 14.07 - 23.61mg/L (96h, Poecilia reticulata)	-	EC50: =9.5mg/L (48h, Daphnia magna) EC50: =15.8mg/L (48h, Daphnia magna)

Persistence and degradability No information available.

Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient
o-Cresol 95-48-7	1.98

Other adverse effects No information available.

13. Disposal considerations

Disposal methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number	U052

14. Transport information

DOT

UN number or ID number	UN2076
Extended proper shipping name	Cresols, liquid (o-Cresol)
Transport hazard class(es)	6.1
Subsidiary hazard class	8
Packing group	II
Reportable Quantity (RQ)	(o-Cresol: RQ (kg)= 45.40) o-Cresol: RQ (lb)= 100.00
Reportable quantity (kg) (calculated)	o-Cresol: RQ (kg)= 45.40
Reportable quantity (lbs) (calculated)	o-Cresol: RQ (lb)= 100.00
Special Provisions	IB2, IP2, IP4, T7, TP2
DOT Marine Pollutant	NP
Description	UN2076, Cresols, liquid (o-Cresol), 6.1 (8), II
Emergency Response Guide Number	153

TDG

Notes	**Forbidden for transport via passenger road and rail.**
UN number or ID number	UN2076
UN proper shipping name	Cresols, liquid (o-Cresol)
Transport hazard class(es)	6.1
Subsidiary hazard class	8
Packing group	II
Marine pollutant	NP
Description	UN2076, Cresols, liquid (o-Cresol), 6.1 (8), II

MEX

UN number or ID number	UN2076
UN proper shipping name	Cresols, liquid
Transport hazard class(es)	6.1
Subsidiary hazard class	8
Packing group	II
Technical Name	o-Cresol
Description	UN2076, Cresols, liquid, 6.1 (8), II

IATA

UN number or ID number	UN2076
UN proper shipping name	Cresols, liquid
Transport hazard class(es)	6.1
Subsidiary hazard class	8
Packing group	II
Technical Name	o-Cresol
Description	UN2076, Cresols, liquid, 6.1 (8), II

ERG Code 6C

IMDG

UN number or ID number	UN2076
UN proper shipping name	Cresols, liquid (o-Cresol)
Transport hazard class(es)	6.1
Subsidiary hazard class	8
Packing group	II
EmS-No.	F-A, S-B
Marine pollutant	NP
Description	UN2076, Cresols, liquid (o-Cresol), 6.1 (8), II

15. Regulatory information

International Inventories

TSCA LGC, to the best of its ability, has confirmed that the chemical substances in this product are listed as “Active” in the EPA (Environmental Protection Agency) “TSCA Inventory Notification (Active-Inactive) Requirements Rule” (“the Final Rule”) of Feb 2019, as amended Feb 2021.”.

Chemical name	CAS No.	Inventory Listing Status	Commercial Activity Designation
o-Cresol	95-48-7	Present	Active

DSL/NDSL	Contact supplier for inventory compliance status.
EINECS/ELINCS	Contact supplier for inventory compliance status.
ENCS	Contact supplier for inventory compliance status.
IECSC	Contact supplier for inventory compliance status.
KECI	Contact supplier for inventory compliance status.
PICCS	Contact supplier for inventory compliance status.
AIIC	Contact supplier for inventory compliance status.

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical name	SARA 313 - Threshold Values %
o-Cresol - 95-48-7	1.0

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
o-Cresol 95-48-7	100 lb	-	-	X

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	Reportable Quantity (RQ)
o-Cresol 95-48-7	100 lb	100 lb	RQ 100 lb final RQ RQ 45.4 kg final RQ

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
o-Cresol 95-48-7	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

NFPA	**Health hazards** 4	**Flammability** 2	**Instability** 0	**Special hazards** -
HMIS	**Health hazards** 4	**Flammability** 2	**Physical hazards** 0	**Personal protection** X

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend	**Section 8: Exposure controls/personal protection**		
TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	Sk*	Skin designation

Key literature references and sources for data used to compile the SDS
Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine’s PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organization for Economic Co-operation and Development Environment, Health, and Safety Publications
Organization for Economic Co-operation and Development High Production Volume Chemicals Program
Organization for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Revision date 13-Jun-2024
Revision Note No information available.

Disclaimer

The information in this Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, we cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. We warrant that the chemical meets the specifications set forth on the label. We (LGC/VHG/ARMI) disclaim any other warranties, expressed or implied with regard to the product supplied hereunder, its merchantability or its fitness for a particular purpose. The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. Read all precautionary information.

End of Safety Data Sheet

1.Identification

Product name:	3-Methylphenol
Catalog#:	G682
IUPAC name:	m-Cresol
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 3), Respiratory system

Pictogram(s)



Signal word:

Warning

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Precautionary statement(s):

P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a poison center or doctor if you feel unwell.
P321	Specific treatment (see supplemental first aid instructions on this label).
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	108-39-4
Purity:	98% (GC)
EC:	203-577-9

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.
Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.
Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.
Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.
Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.
Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Specific hazards arising from the chemical: Carbon oxides.
Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.
Environmental precautions: Do not let product enter drains, other waterways, or soil.
Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.
Conditions for safe storage, including any incompatibilities: Store in a tightly-closed

container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition. ,Store long-term in a cool, dry place.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: TWA 5 ppm (22 mg/m3)
[skin]
NIOSH REL: TWA 2.3 ppm (10 mg/m3)
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes: Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.

Hands: Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.

Skin and body: Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.

Respiratory: Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Colorless to pale red clear liquid or low mp solid
Molecular Formula:	C7H8O
Molecular Weight:	108.14
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	203°C
Freezing/Melting Point:	8-10°C
Flash Point:	86°C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	1.03
Refractive Index:	1.539-1.541
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	GO6125000
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number:	UN2076
Proper shipping name:	Cresols, liquid
Transport hazard class:	6.1 (8);Poison,Corrosive
Packing group:	II

IATA

UN Number:	UN2076
Proper shipping name:	Cresols, liquid
Transport hazard class:	6.1 (8);Poison,Corrosive
Packing group:	II

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not Available..	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 04/05/2022
Printed Date: 04/06/2022

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Version 5.6
Revision Date 05/07/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDT

Product Number : 31041
Brand : Sigma-Aldrich
Index-No. : 602-045-00-7

CAS-No. : 50-29-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P281	Use personal protective equipment as required.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane 1,1-Bis(4-chlorophenyl)-2,2,2-trichloroethane
Formula	:	$C_{14}H_9Cl_5$
Molecular weight	:	354.49 g/mol
CAS-No.	:	50-29-3
EC-No.	:	200-024-3
Index-No.	:	602-045-00-7

Hazardous components

Component	Classification	Concentration
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		
	Acute Tox. 3; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 107 - 110 °C (225 - 230 °F) - lit.
f)	Initial boiling point and boiling range	260.0 °C (500.0 °F)
g)	Flash point	72.0 - 77.0 °C (161.6 - 170.6 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.99 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.91
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Iron and iron salts.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 87.0 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 300.0 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Behavioral:Ataxia.

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: KJ3325000

CNS stimulation.

Pancreas. -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.01 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.01 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.003400 mg/l - 96.0 h
	LOEC - Oncorhynchus mykiss (rainbow trout) - 150 mg/l - 3.0 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 113 mg/l - 3.0 d
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.00108 mg/l - 48 h
Toxicity to algae	LC100 - Scenedesmus quadricauda (Green algae) - > 20 mg/l - 7 d

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus mykiss (rainbow trout) - 20 d - 0.001 mg/l
	Bioconcentration factor (BCF): 46,670

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Reportable Quantity (RQ): 1 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Marine pollutant:yes

IATA

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/07/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.3
Revision Date 02/07/2023
Print Date 01/27/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 4,4′-DDD

Product Number : 35486
Brand : Sigma-Aldrich
CAS-No. : 72-54-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 4), H312
Carcinogenicity (Category 2), H351
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

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operates as MilliporeSigma in the US and Canada

Hazard statement(s)

H301	Toxic if swallowed.
H312	Harmful in contact with skin.
H351	Suspected of causing cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P322	Specific measures (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane
TDE

Formula : $C_{14}H_{10}Cl_4$
Molecular weight : 320.04 g/mol
CAS-No. : 72-54-8
EC-No. : 200-783-0

Component	Classification	Concentration
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane		
	Acute Tox. 3; Acute Tox. 4; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H301, H312, H351, H400, H410 M-Factor - Aquatic Acute: 100 - Aquatic Chronic: 100	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Hydrogen chloride gas
Nature of decomposition products not known.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

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For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

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Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
protective clothing

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	94.0 - 96.0 °C (201.2 - 204.8 °F)
f)	Initial boiling point and boiling range	193.0 °C 379.4 °F at 1.3 hPa
g)	Flash point	No data available
h)	Evaporation rate	No data available

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i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	< 0.000 hPa at 25.0 °C (77.0 °F)
l)	Vapor density	No data available
m)	Density	1.38 g/cm3
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.02
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 113 mg/kg
(Calculation method)
LD50 Oral - Rat - 113.0 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Acute toxicity estimate Dermal - 1,200 mg/kg
(Calculation method)
LD50 Dermal - Rabbit - 1,200 mg/kg
Remarks: Behavioral:Excitement.
Behavioral:Convulsions or effect on seizure threshold.
Skin irritation
(RTECS)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Suspected of causing cancer.

IARC:	2A - Group 2A: Probably carcinogenic to humans (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
ACGIH:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

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Aspiration hazard
No data available

11.2 Additional Information

RTECS: KI0700000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.06 - 0.09 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia pulex (Water flea) - 0.01 mg/l - 48 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Reportable Quantity (RQ): 1 lbs

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Poison Inhalation Hazard: No

IMDG
UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Marine pollutant : yes

IATA
UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 1993-02-16

Pennsylvania Right To Know Components

2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 1993-02-16

2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 1993-02-16

New Jersey Right To Know Components

2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 1993-02-16

California Prop. 65 Components

, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 2007-09-28

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WARNING! This product contains a chemical known in the State of California to cause cancer.2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	CAS-No. 72-54-8	Revision Date 2007-09-28

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.3 Revision Date: 02/07/2023 Print Date: 01/27/2024

The life science business of Merck KGaA, Darmstadt, Germany
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SAFETY DATA SHEET

Version 5.6
Revision Date 05/07/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDT

Product Number : 386340
Brand : Aldrich
Index-No. : 602-045-00-7

CAS-No. : 50-29-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P281	Use personal protective equipment as required.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane 1,1-Bis(4-chlorophenyl)-2,2,2-trichloroethane
Formula	:	$C_{14}H_9Cl_5$
Molecular weight	:	354.49 g/mol
CAS-No.	:	50-29-3
EC-No.	:	200-024-3
Index-No.	:	602-045-00-7

Hazardous components

Component	Classification	Concentration
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		
	Acute Tox. 3; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 107 - 110 °C (225 - 230 °F) - lit.
f)	Initial boiling point and boiling range	260.0 °C (500.0 °F)
g)	Flash point	72.0 - 77.0 °C (161.6 - 170.6 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.99 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.91
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Iron and iron salts.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 87.0 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 300.0 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Behavioral:Ataxia.

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: KJ3325000

CNS stimulation.

Pancreas. -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.01 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.01 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.003400 mg/l - 96.0 h
	LOEC - Oncorhynchus mykiss (rainbow trout) - 150 mg/l - 3.0 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 113 mg/l - 3.0 d
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.00108 mg/l - 48 h
Toxicity to algae	LC100 - Scenedesmus quadricauda (Green algae) - > 20 mg/l - 7 d

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus mykiss (rainbow trout) - 20 d - 0.001 mg/l
	Bioconcentration factor (BCF): 46,670

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Reportable Quantity (RQ): 1 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Marine pollutant:yes

IATA

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/07/2018 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 8.5
Revision Date 11/06/2023
Print Date 01/06/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 4-Ethyltoluene

Product Number : E49800
Brand : Aldrich
CAS-No. : 622-96-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 3), H226
Aspiration hazard (Category 1), H304

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

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Hazard statement(s)

H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P331	Do NOT induce vomiting.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_9H_{12}
Molecular weight	:	120.19 g/mol
CAS-No.	:	622-96-8
EC-No.	:	210-761-2

Component	Classification	Concentration
4-Ethyltoluene		
	Flam. Liq. 3; Asp. Tox. 1; H226, H304	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice

Show this material safety data sheet to the doctor in attendance.

If inhaled

After inhalation: fresh air.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Change contaminated clothing. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please

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contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 10 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Color: light yellow
b)	Odor	characteristic
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point: -62 °C (-80 °F)
f)	Initial boiling point and boiling range	162 °C 324 °F - lit.
g)	Flash point	43 °C (109 °F) - closed cup

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h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	0.861 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	0.0949 g/l at 25 °C (77 °F) - (experimental)
o)	Partition coefficient: n-octanol/water	log Pow: 3.63 - (Lit.), Bioaccumulation is not expected.
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	0.812 mm2/s at 20 °C (68 °F) -
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Vapor/air-mixtures are explosive at intense warming.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Risk of ignition or formation of inflammable gases or vapours with:
Strong oxidizing agents

10.4 Conditions to avoid
Heating.

10.5 Incompatible materials
rubber

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 4,850 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Remarks: No data available

Serious eye damage/eye irritation
Remarks: No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available
May be fatal if swallowed and enters airways.

11.2 Additional Information

RTECS: XT2550000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

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SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3295 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: HYDROCARBONS, LIQUID, N.O.S.

IATA
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.

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SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 8.5 Revision Date: 11/06/2023 Print Date: 01/06/2024

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4-Methylphenol

Apollo Scientific

Chemwatch Hazard Alert Code: **3**

Part Number: **OR6012**
Version No: **2.2**
Safety Data Sheet (Conforms to Annex II of REACH (1907/2006) - Regulation 2020/878)

Issue Date: **05/07/2023**
Print Date: **12/03/2024**
S.REACH.GBR.EN

SECTION 1 Identification of the substance / mixture and of the company / undertaking

1.1. Product Identifier

Product name	4-Methylphenol
Chemical Name	Not Available
Synonyms	Not Available
Proper shipping name	CRESOLS, SOLID
Chemical formula	C7H8O
Other means of identification	Not Available
CAS number	106-44-5*
EC number	203-398-6
Index number	604-004-00-9

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Not Available
Uses advised against	No specific uses advised against are identified.

1.3. Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Apollo Scientific**	**Apollo Scientific ltd**
Address	Whitefield Road, Bredbury SK62QR United Kingdom	Whitefield Road, Bredbury Cheshire SK6 2QR Northern Ireland (UK)
Telephone	01614060505	+44(0) 161 406 0505
Fax	0161 406 0506	Not Available
Website	http://www.apolloscientific.co.uk/	apolloscientific.co.uk
Email	sales@apolloscientific.co.uk	sales@apolloscientific.co.uk

1.4. Emergency telephone number

Association / Organisation	**Not Available**
Emergency telephone numbers	Not Available
Other emergency telephone numbers	Not Available

SECTION 2 Hazards identification

2.1. Classification of the substance or mixture

Page 1 continued...

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments [1]	H301 - Acute Toxicity (Oral) Category 3, H311 - Acute Toxicity (Dermal) Category 3, H314 - Skin Corrosion/Irritation Category 1B, H318 - Serious Eye Damage/Eye Irritation Category 1
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

2.2. Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

P260	Do not breathe dust/fume.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, eye protection and face protection.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. If more than 15 mins from Doctor, INDUCE VOMITING (if conscious).
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352	IF ON SKIN: Wash with plenty of water.
P363	Wash contaminated clothing before reuse.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Precautionary statement(s) Storage

P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

Material contains 4-Methylphenol.

2.3. Other hazards

Inhalation and/or ingestion may produce serious health damage*.

REACH - Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

SECTION 3 Composition / information on ingredients

Continued...

3.1.Substances

1. CAS No 2.EC No 3.Index No 4.REACH No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	SCL / M-Factor	Nanoform Particle Characteristics
1. 106-44-5* 2.203-398-6 3.604-004-00-9 4.Not Available	100	4-Methylphenol *	Acute Toxicity (Oral) Category 3, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 1B, Serious Eye Damage/Eye Irritation Category 1; H301, H311, H314, H318 [1]	Not Available	Not Available

Legend: *1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; * EU IOELVs available; [e] Substance identified as having endocrine disrupting properties*

3.2.Mixtures

See 'Information on ingredients' in section 3.1

SECTION 4 First aid measures

4.1. Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▸ Quickly remove all contaminated clothing, including footwear. ▸ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▸ Transport to hospital, or doctor.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay. ▸ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema. ▸ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs). ▸ As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested. ▸ Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered. **This must definitely be left to a doctor or person authorised by him/her.** (ICSC13719)
Ingestion	▸ For advice, contact a Poisons Information Centre or a doctor at once. ▸ Urgent hospital treatment is likely to be needed. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Transport to hospital or doctor without delay.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

4.3. Indication of any immediate medical attention and special treatment needed

As in all cases of suspected poisoning, follow the ABCDEs of emergency medicine (airway, breathing, circulation, disability, exposure), then the ABCDEs of toxicology (antidotes, basics, change absorption, change distribution, change elimination).
For poisons (where specific treatment regime is absent):

BASIC TREATMENT

Continued...

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 L/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- **DO NOT** use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994
Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorised by him/her should be considered.
(ICSC24419/24421

SECTION 5 Firefighting measures

5.1. Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

5.2. Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

5.3. Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves in the event of a fire. - Prevent, by any means available, spillage from entering drains or water courses. - Use fire fighting procedures suitable for surrounding area. - **DO NOT** approach containers suspected to be hot. - Cool fire exposed containers with water spray from a protected location. - If safe to do so, remove containers from path of fire. - Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	- Non combustible. - Not considered a significant fire risk, however containers may burn. May emit poisonous fumes.

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

See section 8

6.2. Environmental precautions

See section 12

6.3. Methods and material for containment and cleaning up

Minor Spills	- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material. - Check regularly for spills and leaks. - Remove all ignition sources. - Clean up all spills immediately. - Avoid contact with skin and eyes. - Control personal contact with the substance, by using protective equipment.

Continued...

	‣ Use dry clean up procedures and avoid generating dust. ‣ Place in a suitable, labelled container for waste disposal.
Major Spills	‣ Clear area of personnel and move upwind. ‣ Alert Fire Brigade and tell them location and nature of hazard. ‣ May be violently or explosively reactive. ‣ Wear full body protective clothing with breathing apparatus. ‣ Prevent, by any means available, spillage from entering drains or water course. ‣ Consider evacuation (or protect in place). ‣ No smoking, naked lights or ignition sources. ‣ Increase ventilation. ‣ Stop leak if safe to do so. ‣ Water spray or fog may be used to disperse vapour. ‣ Contain or absorb spill with sand, earth or vermiculite. ‣ Use only spark-free shovels and explosion proof equipment. ‣ Collect recoverable product into labelled containers for recycling. ‣ Collect solid residues and seal in labelled drums for disposal. ‣ Wash area and prevent runoff into drains. ‣ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. ‣ If contamination of drains or waterways occurs, advise emergency services.

6.4. Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Safe handling	‣ Avoid all personal contact, including inhalation. ‣ Wear protective clothing when risk of exposure occurs. ‣ Use in a well-ventilated area. ‣ Prevent concentration in hollows and sumps. ‣ **DO NOT** enter confined spaces until atmosphere has been checked. ‣ **DO NOT** allow material to contact humans, exposed food or food utensils. ‣ Avoid contact with incompatible materials. ‣ When handling, **DO NOT** eat, drink or smoke. ‣ Keep containers securely sealed when not in use. ‣ Avoid physical damage to containers. ‣ Always wash hands with soap and water after handling. ‣ Work clothes should be laundered separately. Launder contaminated clothing before re-use. ‣ Use good occupational work practice. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS. ‣ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Fire and explosion protection	See section 5
Other information	‣ Store in original containers. ‣ Keep containers securely sealed. ‣ Store in a cool, dry, well-ventilated area. ‣ Store away from incompatible materials and foodstuff containers. ‣ Protect containers against physical damage and check regularly for leaks. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS.

7.2. Conditions for safe storage, including any incompatibilities

Suitable container	‣ Lined metal can, lined metal pail/ can. ‣ Plastic pail. ‣ Polyliner drum. ‣ Packing as recommended by manufacturer. ‣ Check all containers are clearly labelled and free from leaks. For low viscosity materials ‣ Drums and jerricans must be of the non-removable head type. ‣ Where a can is to be used as an inner package, the can must have a screwed enclosure. For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.): ‣ Removable head packaging; ‣ Cans with friction closures and ‣ low pressure tubes and cartridges may be used. - Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in

Continued...

	contact with inner and outer packages *. - In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *. - * unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic. All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.
Storage incompatibility	‣ Hygroscopic ‣ Light sensitive ‣ Store under argon
Hazard categories in accordance with Regulation (EC) No 2012/18/EU (Seveso III)	Not Available
Qualifying quantity (tonnes) of dangerous substances as referred to in Article 3(10) for the application of	Not Available

7.3. Specific end use(s)

See section 1.2

SECTION 8 Exposure controls / personal protection

8.1. Control parameters

Ingredient	DNELs Exposure Pattern Worker	PNECs Compartment
4-Methylphenol	Dermal 0.7 mg/kg bw/day (Systemic, Chronic) Inhalation 2.47 mg/m³ (Systemic, Chronic) Dermal 3.5 mg/kg bw/day (Systemic, Acute) Inhalation 12.35 mg/m³ (Systemic, Acute) *Dermal 0.25 mg/kg bw/day (Systemic, Chronic) ** *Inhalation 0.43 mg/m³ (Systemic, Chronic) ** *Oral 0.25 mg/kg bw/day (Systemic, Chronic) ** *Dermal 1.25 mg/kg bw/day (Systemic, Acute) ** *Inhalation 2.15 mg/m³ (Systemic, Acute) ** *Oral 1.25 mg/kg bw/day (Systemic, Acute) **	0.1 mg/L (Water (Fresh)) 0.044 mg/L (Water - Intermittent release) 0.01 mg/L (Water (Marine)) 0.85 mg/kg sediment dw (Sediment (Fresh Water)) 0.085 mg/kg sediment dw (Sediment (Marine)) 0.111 mg/kg soil dw (Soil) 1.65 mg/L (STP)

* Values for General Population

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	4-Methylphenol	Cresol (all isomers)	5 ppm / 22 mg/m3	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
4-Methylphenol	14 ppm	25 ppm	250 ppm

Ingredient	Original IDLH	Revised IDLH
4-Methylphenol	250 ppm	Not Available

8.2. Exposure controls

8.2.1. Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

Continued...

The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

8.2.2. Individual protection measures, such as personal protective equipment



Eye and face protection

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

Skin protection

See Hand protection below

Hands/feet protection

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity

Continued...

	Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). · When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. · Contaminated gloves should be replaced. As defined in ASTM F-739-96 in any application, gloves are rated as: · Excellent when breakthrough time > 480 min · Good when breakthrough time > 20 min · Fair when breakthrough time < 20 min · Poor when glove material degrades For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: · Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Body protection	See Other protection below
Other protection	‣ Overalls. ‣ PVC Apron. ‣ PVC protective suit may be required if exposure severe. ‣ Eyewash unit. ‣ Ensure there is ready access to a safety shower.

Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	- -	PAPR-P1 -
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

· Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
· The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
· Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
· Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
· Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
· Use approved positive flow mask if significant quantities of dust becomes airborne.
· Try to avoid creating dust conditions.

8.2.3. Environmental exposure controls

See section 12

SECTION 9 Physical and chemical properties

Continued...

9.1. Information on basic physical and chemical properties

Appearance	Not Available

Physical state	Solid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	32-34	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	202	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Not Available	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available
Nanoform Solubility	Not Available	**Nanoform Particle Characteristics**	Not Available
Particle Size	Not Available		

9.2. Other information

Not Available

SECTION 10 Stability and reactivity

10.1.Reactivity	See section 7.2
10.2. Chemical stability	‣ Unstable in the presence of incompatible materials. ‣ Product is considered stable. ‣ Hazardous polymerisation will not occur.
10.3. Possibility of hazardous reactions	See section 7.2
10.4. Conditions to avoid	See section 7.2
10.5. Incompatible materials	See section 7.2
10.6. Hazardous decomposition products	See section 5.3

SECTION 11 Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008 Information on toxicological effects

Inhaled	The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Inhalation of vapours, aerosols (mists, fumes) or dusts, generated by the material during the course of normal handling, may produce severe damage to the health of the individual. Relatively small amounts absorbed from the lungs may prove fatal.
Ingestion	The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion. Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal. Some phenol derivatives can cause damage to the digestive system. If absorbed, profuse sweating, thirst, nausea, vomiting, diarrhoea, cyanosis, restlessness, stupor, low blood pressure, gasping, abdominal pain, anaemia, convulsions, coma and lung swelling can happen followed by pneumonia.

Continued...

Skin Contact	The material can produce chemical burns following direct contact with the skin. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. If applied to the eyes, this material causes severe eye damage.
Chronic	Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Long-term exposure to phenol derivatives can cause skin inflammation, loss of appetite and weight, weakness, muscle aches and pain, liver damage, dark urine, loss of nails, skin eruptions, diarrhoea, nervous disorders with headache, salivation, fainting, discolouration of the skin and eyes, vertigo and mental disorders, and damage to the liver and kidneys.

4-Methylphenol	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 301 mg/kg[2]	Not Available
	Inhalation (Rat) LC50: >0.178 mg/l4h[1]	
	Oral (Rat) LD50: 207 mg/kg[2]	

Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

4-Methylphenol	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.

Acute Toxicity	✔	**Carcinogenicity**	✘
Skin Irritation/Corrosion	✔	**Reproductivity**	✘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✘
Respiratory or Skin sensitisation	✘	**STOT - Repeated Exposure**	✘
Mutagenicity	✘	**Aspiration Hazard**	✘

Legend: ✘ *– Data either not available or does not fill the criteria for classification*
✔ *– Data available to make classification*

11.2 Information on other hazards

11.2.1. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

11.2.2. Other information

See Section 11.1

SECTION 12 Ecological information

12.1. Toxicity

4-Methylphenol	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	48h	Crustacea	7.7mg/l	2
	ErC50	72h	Algae or other aquatic plants	23mg/l	2

Continued...

	EC50	72h	Algae or other aquatic plants	0.11mg/l	4
	EC50(ECx)	72h	Algae or other aquatic plants	0.11mg/l	4
	LC50	96h	Fish	2.66-4.592mg/L	4
Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*				

DO NOT discharge into sewer or waterways.

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
4-Methylphenol	LOW (Half-life = 28 days)	LOW (Half-life = 0.63 days)

12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
4-Methylphenol	LOW (LogKOW = 1.94)

12.4. Mobility in soil

Ingredient	Mobility
4-Methylphenol	LOW (Log KOC = 434)

12.5. Results of PBT and vPvB assessment

	P	B	T
Relevant available data	Yes	Yes	Yes
PBT	✗	✗	✗
vPvB	✗	✗	✗

PBT Criteria fulfilled?	No
vPvB	No

12.6. Endocrine disrupting properties

No evidence of endocrine disrupting properties were found in the current literature.

12.7. Other adverse effects

No evidence of ozone depleting properties were found in the current literature.

SECTION 13 Disposal considerations

13.1. Waste treatment methods

Product / Packaging disposal	‣ Recycle wherever possible. ‣ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. ‣ Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation followed by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material) ‣ Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
Waste treatment options	Not Available
Sewage disposal options	Not Available

SECTION 14 Transport information

Labels Required

Continued...

	
Marine Pollutant	NO
HAZCHEM	2X

Land transport (ADR-RID)

14.1. **UN number or ID number**	3455
14.2. **UN proper shipping name**	CRESOLS, SOLID
14.3. **Transport hazard class(es)**	Class: 6.1 Subsidiary Hazard: 8
14.4. **Packing group**	II
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Hazard identification (Kemler): 68 Classification code: TC2 Hazard Label: 6.1 +8 Special provisions: Not Applicable Limited quantity: 500 g Tunnel Restriction Code: D/E

Air transport (ICAO-IATA / DGR)

14.1. **UN number**	3455
14.2. **UN proper shipping name**	Cresols, solid
14.3. **Transport hazard class(es)**	ICAO/IATA Class: 6.1 ICAO / IATA Subsidiary Hazard: 8 ERG Code: 6C
14.4. **Packing group**	II
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Special provisions: Not Applicable Cargo Only Packing Instructions: 675 Cargo Only Maximum Qty / Pack: 50 kg Passenger and Cargo Packing Instructions: 668 Passenger and Cargo Maximum Qty / Pack: 15 kg Passenger and Cargo Limited Quantity Packing Instructions: Y644 Passenger and Cargo Limited Maximum Qty / Pack: 1 kg

Sea transport (IMDG-Code / GGVSee)

14.1. **UN number**	3455
14.2. **UN proper shipping name**	CRESOLS, SOLID
14.3. **Transport hazard class(es)**	IMDG Class: 6.1 IMDG Subsidiary Hazard: 8
14.4. **Packing group**	II
14.5 **Environmental hazard**	Not Applicable

Continued...

14.6. **Special precautions for user**	EMS Number	F-A , S-B
	Special provisions	Not Applicable
	Limited Quantities	500 g

Inland waterways transport (ADN)

14.1. **UN number**	3455
14.2. **UN proper shipping name**	CRESOLS, SOLID
14.3. **Transport hazard class(es)**	6.1 | 8
14.4. **Packing group**	II
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Classification code: TC2 Special provisions: 802 Limited quantity: 500 g Equipment required: PP, EP Fire cones number: 2

14.7. Maritime transport in bulk according to IMO instruments

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Product name	Pollution Category	Ship Type
Cresols (all isomers)	Y	1

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
4-Methylphenol	Not Available

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
4-Methylphenol	Not Available

SECTION 15 Regulatory information

15.1. Safety, health and environmental regulations / legislation specific for the substance or mixture

4-Methylphenol is found on the following regulatory lists

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)
EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances
Europe EC Inventory
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI

Additional Regulatory Information

Not Applicable

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2020/878; Regulation (EC) No 1272/2008 as updated through ATPs.

Information according to 2012/18/EU (Seveso III):

Seveso Category	Not Available

15.2. Chemical safety assessment

Continued...

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (4-Methylphenol)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	05/07/2023
Initial Date	05/07/2023

Full text Risk and Hazard codes

H318	Causes serious eye damage.

SDS Version Summary

Version	Date of Update	Sections Updated
1.2	05/07/2023	Physical and chemical properties - Appearance, CAS Number, Exposure controls / personal protection - Engineering Control, Firefighting measures - Fire Fighter (extinguishing media), Firefighting measures - Fire Fighter (fire/explosion hazard), Composition / information on ingredients - Ingredients, Korean MSDS Number, Identification of the substance / mixture and of the company / undertaking - Supplier Information, Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
EN 166 Personal eye-protection
EN 340 Protective clothing
EN 374 Protective gloves against chemicals and micro-organisms
EN 13832 Footwear protecting against chemicals
EN 133 Respiratory protective devices

Definitions and abbreviations

- PC—TWA: Permissible Concentration-Time Weighted Average
- PC—STEL: Permissible Concentration-Short Term Exposure Limit

Continued...

- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit。
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	Classification Procedure
Acute Toxicity (Oral) Category 3, H301	Expert judgement
Acute Toxicity (Dermal) Category 3, H311	Expert judgement
Skin Corrosion/Irritation Category 1B, H314	Expert judgement
Serious Eye Damage/Eye Irritation Category 1, H318	Calculation method

Powered by AuthorITe, from Chemwatch.

end of SDS

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/29/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Acetone

Product Number : 650501
Brand : SIGALD
Index-No. : 606-001-00-8

CAS-No. : 67-64-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.

P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_3H_6O
Molecular weight	:	58.08 g/mol
CAS-No.	:	67-64-1
EC-No.	:	200-662-2
Index-No.	:	606-001-00-8

Hazardous components

Component	Classification	Concentration
Acetone		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	186mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	62mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	62mg/kg BW/d
Workers	Inhalation	Acute systemic effects	2420 mg/m3
Workers	Inhalation	Long-term systemic effects	1210 mg/m3

Consumers	Inhalation	Long-term systemic effects	200 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	33.3 mg/kg
Marine water	1.06 mg/l
Fresh water	10.6 mg/l
Marine sediment	3.04 mg/kg
Fresh water sediment	30.4 mg/kg
Onsite sewage treatment plant	100 mg/l

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engine protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available

d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -94 °C (-137 °F)
f)	Initial boiling point and boiling range	56 °C (133 °F) at 1013 hPa
g)	Flash point	-17.0 °C (1.4 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	533.3 hPa at 39.5 °C (103.1 °F) 245.3 hPa at 20.0 °C(68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.791 g/mL at 25 °C (77 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.24
p)	Auto-ignition temperature	465.0 °C (869.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23.2 mN/m at 20.0 °C (68.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents, Acetone reacts violently with phosphorous oxychloride.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,800 mg/kg(Acetone)
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Tremor. Behavioral:Headache. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
LC50 Inhalation - Rat - 8 h - 50,100 mg/m3(Acetone)
Remarks: Drowsiness Dizziness Unconsciousness
LD50 Dermal - Guinea pig - 7,426 mg/kg(Acetone)
No data available(Acetone)

Skin corrosion/irritation
Skin - Rabbit(Acetone)
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit(Acetone)
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
- Guinea pig(Acetone)
Result: Does not cause skin sensitisation.

Germ cell mutagenicity

No data available(Acetone)

Carcinogenicity
This product is or contains a component that is not classifiable as to its classification.(Acetone)
(Acetone)
(Acetone)

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Acetone)

No data available(Acetone)

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.(Acetone)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Acetone)

Additional Information
RTECS: AL3150000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Acetone)

Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence

Kidney - Irregularities - Based on Human Evidence(Acetone)
Skin - Dermatitis - Based on Human Evidence(Acetone)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5,540 mg/l - 96 h(Acetone)
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 8,800 mg/l - 48 h(Acetone)
Toxicity to algae	Remarks: No data available

12.2 Persistence and degradability

Biodegradability: Result: 91 % - Readily biodegradable.
(OECD Test Guideline 301B)

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

No data available(Acetone)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone
Reportable Quantity (RQ) : 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1090 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ACETONE

IATA
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/29/2019

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/26/2019 Version Number 1 Reviewed on 03/26/2019

1 Identification

· **Product identifier**

· **Trade name: alpha-BHC**

· **Part number:** FRSP-180B
· **CAS Number:**
319-84-6
· **EC number:**
206-270-8
· **Index number:**
602-042-00-0
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 3 H331 Toxic if inhaled.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.


GHS07

Acute Tox. 4 H312 Harmful in contact with skin.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS06 GHS08

· **Signal word** Danger

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: alpha-BHC

(Contd. of page 1)

· **Hazard-determining components of labeling:**
alpha-BHC (alpha-HCH)
· **Hazard statements**
Toxic if swallowed or if inhaled.
Harmful in contact with skin.
Suspected of causing cancer.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
Specific treatment (see on this label).
Rinse mouth.
If on skin: Wash with plenty of water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
Take off contaminated clothing and wash it before reuse.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 4
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 3
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
319-84-6 alpha-BHC (alpha-HCH)
· **Identification number(s)**
· **EC number:** 206-270-8

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

Trade name: alpha-BHC

(Contd. of page 2)

· **Index number:** 602-042-00-0

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
· **After inhalation:**
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
Substance is not listed.

· **PAC-2:**
Substance is not listed.

(Contd. on page 4)

(Contd. of page 3)

· **PAC-3:**
Substance is not listed.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Thorough dedusting.
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.
At this time, the other constituents have no known exposure limits.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

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· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:** Not required.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Solid
Color:	Not determined.
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	156-161 °C (312.8-321.8 °F)
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Product is not flammable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	0.000073 hPa (0 mm Hg)
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.

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VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
Solids content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	177 mg/kg (rat)
Dermal	LD50	1,100 mg/kg
Inhalative	LC50/4 h	0.5 mg/L

319-84-6 alpha-BHC (alpha-HCH)

Oral	LD50	177 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

2B

· **NTP (National Toxicology Program)**

R

· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.

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· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Self-assessment): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN2811
· **UN proper shipping name**	
· **DOT**	Toxic solids, organic, n.o.s. (alpha-BHC (alpha-HCH))
· **IMDG, IATA**	TOXIC SOLID, ORGANIC, N.O.S. (alpha-BHC (alpha-HCH))
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	
· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	F-A,S-A
· **Stowage Category**	A

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· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 100 kg On cargo aircraft only: 200 kg
· **Hazardous substance:**	10 lbs, 4.54 kg
· **IMDG**	
· **Limited quantities (LQ)**	5 kg
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 g Maximum net quantity per outer packaging: 1000 g
· **UN "Model Regulation":**	UN 2811 TOXIC SOLID, ORGANIC, N.O.S. (ALPHA-BHC (ALPHA-HCH)), 6.1, III, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **TSCA new (21st Century Act): (Substances not listed)**
319-84-6 alpha-BHC (alpha-HCH)

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
B2

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

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Trade name: alpha-BHC

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· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Date of preparation / last revision** 03/26/2019 / -

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Acute Tox. 3: Acute toxicity – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Carc. 2: Carcinogenicity – Category 2

SAFETY DATA SHEET

Version 6.15
Revision Date 05/07/2025
Print Date 05/08/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Arsenic

Product Number : 202657
Brand : Aldrich
Index-No. : 033-001-00-X
CAS-No. : 7440-38-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 3

Acute toxicity : Category 3

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(Inhalation)

Carcinogenicity	:	Category 1A
Reproductive toxicity	:	Category 1A
Specific target organ toxicity - repeated exposure (Oral)	:	Category 1 (Respiratory organs, Cardio-vascular system, Gastro-intestinal system, Central nervous system, Nervous system)
Short-term (acute) aquatic hazard	:	Category 1
Long-term (chronic) aquatic hazard	:	Category 1

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H301 + H331 Toxic if swallowed or if inhaled.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H372 Causes damage to organs (Respiratory organs, Cardio-vascular system, Gastro-intestinal system, Central nervous system, Nervous system) through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 + P330 IF SWALLOWED: Immediately call

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a POISON CENTER/ doctor. Rinse mouth.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P391 Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
arsenic	7440-38-2*	>= 90 - <= 100	-

* Indicates that the identifier is a CAS No.
Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : First aiders need to protect themselves.
Show this material safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Immediately call in physician.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist.
Remove contact lenses.

If swallowed : If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In

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exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

Most important symptoms and effects, both acute and delayed	:	The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11
Protection of first-aiders	:	For personal protection see section 8.
Notes to physician	:	No data available

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Not combustible. Ambient fire may liberate hazardous vapours.
Hazardous combustion products	:	Arsenic oxides
Specific extinguishing methods	:	No data available
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions,	:	Advice for non-emergency personnel:

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protective equipment and emergency procedures		Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	:	Do not let product enter drains.
Methods and materials for containment and cleaning up	:	Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on safe handling	:	Work under hood. Do not inhale substance/mixture.
Further information on storage conditions	:	Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Storage class	:	6.1A, Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials
Recommended storage temperature	:	Recommended storage temperature see product label.
Packaging material	:	Suitable material: Amber Glass Bottle/Jar

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
arsenic	7440-38-2	TWA	0.01 mg/m3	ACGIH
		C	0.0020 mg/m3 (Arsenic)	NIOSH REL

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Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
arsenic	7440-38-2	inorganic arsenic plus methylated metabolites (Arsenic)	Urine	End of shift	15 µg/g creatinine	ACGIH BEI
		inorganic arsenic plus methylated metabolites (Arsenic)	Urine	At the end of the work week	15 µg/g creatinine	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P3

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	KCL 741 Dermatril® L
Material	:	Nitrile rubber

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Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	KCL 741 Dermatril® L
Remarks	:	This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Eye protection	:	Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Skin and body protection	:	protective clothing
Hygiene measures	:	Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder
Color	:	gray
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point/ range	:	1503 °F / 817 °C Method: lit.
Boiling point/boiling range	:	1135 °F / 613 °C Method: lit.
Flash point	:	Not applicable
Evaporation rate	:	No data available
Burning rate	:	No data available
Self-ignition	:	> 806 °F / > 430 °C

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		GLP: yes does not ignite
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	5.6 (72.3 °F / 22.4 °C) Method: OECD Test Guideline 109 GLP: yes
Density	:	5.727 g/mL (77 °F / 25 °C) Method: lit.
Solubility(ies) Water solubility	:	ca. 0.0106 g/l slightly soluble (68 °F / 20 °C) pH: 5.9 - 6.2 Method: OECD Test Guideline 105 GLP: yes
Partition coefficient: n-octanol/water	:	Not applicable for inorganic substances
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	Not classified as explosive.
Oxidizing properties	:	none
Molecular weight	:	74.92 g/mol
Particle characteristics Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

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Reactivity	:	No data available
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Exothermic reaction with: Aluminum Bromine bromates chlorates iodates Nitric acid Risk of ignition or formation of inflammable gases or vapours with: nitrates Alkali metals Zinc Reducing agents Strong oxidizing agents Risk of explosion with: potassium permanganate azides halogen-halogen compounds Peroxides nitrogen trichloride
Conditions to avoid	:	Heat. Exposure to air may affect product quality. no information available
Incompatible materials	:	No data available
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Mouse - 145 mg/kg
Remarks: Behavioral:Ataxia.
Diarrhea
(RTECS)
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

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Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Ames test
Test system: Escherichia coli
Result: negative
Remarks: (ECHA)

Carcinogenicity
May cause cancer. Positive evidence from human epidemiological studies.

IARC:	1 - Group 1: Carcinogenic to humans (arsenic)
NTP:	Known - Known to be human carcinogen (arsenic)
OSHA:	OSHA specifically regulated carcinogen (arsenic)

Reproductive toxicity
May damage fertility. Positive evidence from human epidemiological studies.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Oral - Causes damage to organs through prolonged or repeated exposure.
- Respiratory organs, Cardio-vascular system, Gastro-intestinal system, Central nervous system, Nervous system

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 104 Weeks - LOAEL (Lowest observed adverse effect level) - 100 mg/kg
Remarks: (ECHA)

RTECS: CG0525000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

The following applies to arsenic and its compounds in general: they take effect as capillary and enzyme toxins. Symptoms of arsenic poisoning: acute: after inhalation, mucosal irritations with coughing, dyspnoea, pain in the thorax. Perforations within the respiratory tract are possible. After oral uptake, gastrointestinal disorders with vomiting, diarrhoea, and spasms, CNS disorders with headache, confusion, shaking fits and disturbed consciousness, cardiovascular disorders all the way to circulatory collapse. Chronic: exanthema, dermal lesions in the form of hyperkeratosis and hypermelanosis, loss of hair, conjunctivitis and polyneuropathy, impaired hepatic function, and renal damage. After accumulation in the liver, kidneys, and skin, arsenic is eliminated from the organism only slowly. Experience has shown arsenic compounds to be carcinogenic in man.

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Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

arsenic:

Toxicity to fish	:	LC50 (Oreochromis mossambicus (Mozambique tilapia)): 28.68 mg/l End point: mortality Exposure time: 96 h Test Type: static test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Bosmina longirostris (water flea)): 0.85 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to algae/aquatic plants	:	NOEC (Macrocystis pyrifera (brown algae)): 0.04 mg/l Exposure time: 42 h Test Type: static test Analytical monitoring: yes Remarks: (ECHA)
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 2.13 mg/l End point: Growth inhibition Exposure time: 35 d Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic	:	NOEC (Shrimp): 0.631 mg/l End point: mortality

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invertebrates (Chronic toxicity)		Exposure time: 51 d Test Type: flow-through test Analytical monitoring: yes Remarks: (ECHA)
M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (activated sludge): 10.6 mg/l Exposure time: 10 Days Test Type: static test Remarks: (ECHA)

Persistence and degradability

Components:

arsenic:

Biodegradability	:	Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Bioaccumulative potential

Components:

arsenic:

Partition coefficient: n-octanol/water	:	Remarks: Not applicable for inorganic substances

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product

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itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1558
Proper shipping name	:	Arsenic
Class	:	6.1
Packing group	:	II
Labels	:	Division 6.1 - Toxic substances
Packing instruction (cargo aircraft)	:	676
Packing instruction (passenger aircraft)	:	669

IMDG-Code

UN number	:	UN 1558
Proper shipping name	:	ARSENIC
Class	:	6.1
Packing group	:	II
Labels	:	6.1
EmS Code	:	F-A, S-A
Marine pollutant	:	yes

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National regulation

49 CFR Road

UN/ID/NA number	:	UN 1558
Proper shipping name	:	Arsenic
Class	:	6.1
Packing group	:	II
Labels	:	Division 6.1 - Toxic substances
ERG Code	:	152
Marine pollutant	:	no
Poison Inhalation Hazard	:	No

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
arsenic	7440-38-2	1	1
arsenic	7440-38-2	1	1 (D004)

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

arsenic 7440-38-2 >= 90 - <= 100 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

arsenic 7440-38-2 >= 90 - <= 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

arsenic 7440-38-2 >= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

arsenic 7440-38-2 >= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

arsenic 7440-38-2

Pennsylvania Right To Know

arsenic 7440-38-2

Maine Chemicals of High Concern

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Product does not contain any listed chemicals

Vermont Chemicals of High Concern

arsenic	7440-38-2

Washington Chemicals of High Concern

arsenic	7440-38-2

California Prop. 65

WARNING: This product can expose you to chemicals including arsenic, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / C	:	Ceiling value not be exceeded at any time.

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed

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(Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
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Revision Date : 05/07/2025

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US / EN

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SAFETY DATA SHEET

Version 6.8
Revision Date 08/11/2021
Print Date 02/05/2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Barium

Product Number : 474711
Brand : Aldrich
CAS-No. : 7440-39-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable solids (Category 1), H228
Chemicals which, in contact with water, emit flammable gases (Category 1), H260
Acute toxicity, Oral (Category 3), H301
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

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Hazard statement(s)

H228	Flammable solid.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H301	Toxic if swallowed.
H314	Causes severe skin burns and eye damage.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P223	Do not allow contact with water.
P231 + P232	Handle under inert gas. Protect from moisture.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P260	Do not breathe dusts or mists.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P402 + P404	Store in a dry place. Store in a closed container.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	Ba
Molecular weight	:	137.33 g/mol
CAS-No.	:	7440-39-3
EC-No.	:	231-149-1

Component	Classification	Concentration
barium		
	Flam. Sol. 1; 1; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; H228, H260,	<= 100 %

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	H301, H314, H318	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
Water Foam

5.2 Special hazards arising from the substance or mixture
Barium oxide
Not combustible.
May not get in touch with: Water
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

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5.4 Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Keep workplace dry. Do not allow product to come into contact with water.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.
Never allow product to get in contact with water during storage.

Store under inert gas.

Storage class

Storage class (TRGS 510): 4.3: Hazardous materials, which set free flammable gases upon contact with water

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
barium	7440-39-3	TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		
		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when dusts are generated.

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Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Pieces Color: gray
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 725 °C (1337 °F) - lit.
f)	Initial boiling point and boiling range	1,640 °C 2,984 °F - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 1.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	3.6 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

No data available

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SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat.
Moisture.

10.5 Incompatible materials
Oxidizing agents, Water, acids, Oxygen, Chlorinated solvents, Carbon dioxide (CO2), Halogens, Halogenated hydrocarbon, Alcohols, Sulfur compounds, Hydrogen sulfide gas

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
Causes severe burns. (ECHA)

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Carcinogenicity

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IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: CQ8370000
Stomach/intestinal disorders, Nausea, Vomiting, Drowsiness, Dizziness, Gastrointestinal disturbance, Weakness, Tremors, Seizures.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Danio rerio (zebra fish) - > 3.5 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 14.5 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	Growth inhibition ErC50 - Pseudokirchneriella subcapitata (green algae) - > 1.15 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	static test EC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability
The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

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12.6 Other adverse effects

Biological effects:
Product reacts with water.
Hazardous decomposition products
Harmful effect due to pH shift.
Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1400 Class: 4.3 Packing group: II EMS-No: F-G, S-O
Proper shipping name: BARIUM

IATA

UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
barium	7440-39-3	2007-07-01

SARA 311/312 Hazards

Reactivity Hazard

Reportable Quantity : D005 lbs

Massachusetts Right To Know Components

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No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.8 Revision Date: 08/11/2021 Print Date: 02/05/2022

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SAFETY DATA SHEET

Revision Date 05-Dec-2011 **Revision Number** 1

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Identifier

Product Description: **BENZENE**
Cat No. **B/1550/08**
Synonyms Cyclohexatriene; Phenyl hydride.; Benzol

Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals
Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific UK
Bishop Meadow Rd
Loughborough, Leicestershire, Great Britain
LE115RG
Tel: 01509 231166
E-mail address begel.sdsdesk@thermofisher.com

Emergency Telephone Number
Tel: 01509 231166 Chemtrec US: (800) 424-9300
Chemtrec EU: 001 (202) 483-7616

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture
REGULATION (EC) No 1272/2008

Aspiration Toxicity	Category 1
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Specific target organ systemic toxicity (repeated exposure)	Category 1
Flammable liquids.	Category 2

Classification according to EU Directives 67/548/EEC or 1999/45/EC

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16

Symbol(s) T - Toxic
F - Highly flammable

R-phrase(s) R11 - Highly flammable
R45 - May cause cancer
R46 - May cause heritable genetic damage
R65 - Harmful: may cause lung damage if swallowed

Risk Combination Phrases R36/38 - Irritating to eyes and skin
R48/23/24/25 - Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed

SECTION 2. HAZARDS IDENTIFICATION

Label Elements



Signal Word **Danger**

Hazard Statements
H315 - Causes skin irritation
H304 - May be fatal if swallowed and enters airways
H319 - Causes serious eye irritation
H340 - May cause genetic defects
H350 - May cause cancer
H372 - Causes damage to organs through prolonged or repeated exposure
H225 - Highly flammable liquid and vapor

Precautionary Statements - EU (§28, 1272/2008)
P201 - Obtain special instructions before use
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P240 - Ground/bond container and receiving equipment
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician
P307 + P311 - IF exposed: Call a POISON CENTER or doctor/ physician

Other Hazards
No information available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	EC-No.	Weight %	CAS-No	67/548/EEC Classification	CLP Classification - Regulation (EC) No 1272/2008	REACH No.
Benzene 71-43-2	EEC No. 200-753-7	> 99	71-43-2	F; R11 Xi; R36/38 Carc.Cat.1; R45 Muta.Cat.2; R46 T; R48/23/24/25 Xn; R65	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Muta. 1B (H340) Carc. 1A (H350) STOT RE 1 (H372) Asp. Tox. 1 (H304) Flam. Liq. 2 (H225)	-

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16

SECTION 4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

Notes to Physician Treat symptomatically

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

Extinguishing media which must not be used for safety reasons
No information available.

Special hazards arising from the substance or mixture

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Advice for fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental precautions

Should not be released into the environment.

Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use explosion-proof equipment. Do not breathe vapors/dust. Do not ingest. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Flammables area. Keep away from heat and sources of ignition.

Specific End Uses

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits

Component	European Union	The United Kingdom	France	Belgium	Spain
Benzene	TWA: 1 ppm 8 hr TWA: 3.25 mg/m^3 8 hr	STEL: 3 ppm 15 min STEL: 9.75 mg/m^3 15 min TWA: 1 ppm 8 hr TWA: 3.25 mg/m^3 8 hr Skin	VME: 1 ppm 8 heures. restrictive limit VME: 3.25 mg/m^3 8 heures. restrictive limit Skin	TWA: 1 ppm 8 uren TWA: 3.25 mg/m^3 8 uren Skin	Skin VLA-ED: 1 ppm 8 horas VLA-ED: 3.25 mg/m^3 8 horas

Component Benzene

Italy	Germany	Portugal	The Netherlands	Finland
TWA: 1 ppm 8 ore. TWA: 3.25 mg/m^3 8 ore. Skin	Skin	STEL: 2.5 ppm 15 minutos TWA: 0.5 ppm 8 horas Skin	Skin TWA: 3.25 mg/m^3 8 uren	TWA: 1 ppm 8 tunteina TWA: 3.25 mg/m^3 8 tunteina Skin

Component Benzene

Austria	Denmark	Switzerland	Poland	Norway
Skin	TWA: 0.5 ppm 8 timer TWA: 1.6 mg/m^3 8 timer Skin	Skin MAK: 0.5 ppm 8 Stunden MAK: 1.6 mg/m^3 8 Stunden	NDS: 1.6 mg/m^3 8 godzinach	TWA: 1 ppm 8 timer TWA: 3 mg/m^3 8 timer STEL: 3 ppm 15 minutter. STEL: 6 mg/m^3 15 minutter.

Component Benzene

Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
TWA: 3.25 mg/m^3 Skin notation	Skin Notation TWA: 5 ppm 8 satima. TWA: 15 mg/m^3 8 satima.	TWA: 1 ppm 8 hr. TWA: 3 mg/m^3 8 hr. Skin	Skin-potential for cutaneous absorption TWA: 1 ppm TWA: 3.25 mg/m^3	TWA: 3 mg/m^3 8 hodinách. Potential for cutaneous absorption Ceiling: 10 mg/m^3

Component Benzene

Estonia	Gibraltar	Greece	Hungary	Iceland
Skin notation TWA: 0.5 ppm 8 tundides. TWA: 1.5 mg/m^3 8 tundides. STEL: 3 ppm 15 minutites. STEL: 9 mg/m^3 15 minutites.		skin - potential for cutaneous absorption TWA: 1.0 ppm TWA: 3.19 mg/m^3	potential for cutaneous absorption Ceiling: 3 mg/m^3	TWA: 0.5 ppm 8 klukkustundum. TWA: 1.6 mg/m^3 8 klukkustundum. Skin notation Ceiling: 1 ppm Ceiling: 3.2 mg/m^3

Component Benzene

Latvia	Lithuania	Luxembourg	Malta	Romania
skin - potential for cutaneous exposure TWA: 1 ppm TWA: 3.25 mg/m^3	TWA: 1 ppm TWA: 3.25 mg/m^3 Skin notation STEL: 6 ppm STEL: 19 mg/m^3	Possibility of significant uptake through the skin TWA: 1 ppm 8 Stunden TWA: 3.25 mg/m^3 8 Stunden		Skin notation TWA: 1 ppm 8 ore TWA: 3.25 mg/m^3 8 ore

Component Benzene

Russia - TWA	Slovak Republic	Slovenia	Sweden	Turkey
TWA: 5 mg/m^3 Skin notation STEL: 15 mg/m^3 vapor	TWA: 1.0 ppm 8 hodinách TWA: 3.25 mg/m^3 8 hodinách Potential for cutaneous absorption STEL: 5.0 ppm 15 minútach STEL: 16.25 mg/m^3 15 minútach	TWA: 1 ppm 8 urah TWA: 3.25 mg/m^3 8 urah Potential for cutaneous absorption STEL: 4 ppm 15 minutah STEL: 13 mg/m^3 15 minutah	STV: 3 ppm 15 minuter STV: 9 mg/m^3 15 minuter LLV: 0.5 ppm 8 timmar. LLV: 1.5 mg/m^3 8 timmar. Skin notation	

Biological limit values

Component	European Union	United Kingdom	France	Spain	Germany
Benzene			Muconic acid: 5 mg/L urine end of shift	S-Phenylmercapturic acid: 0.045 mg/g urine end of exposure or end of shift t,t-Muconic acid: 2 mg/L urine end of exposure or end of shift total benzene: 5 µg/L blood end of exposure or end of shift	

Component	Austria	Switzerland	Poland	Norway	Ireland
Benzene		S-Phenyl-mercapturic acid: 25 µg/g creatinine urine end of shift t,t-Muconic acid: 500 µg/g creatinine urine end of shift			

Component	Bulgaria	Gibraltar	Latvia	Luxembourg	Romania
Benzene	Trans, trans-muconic acid: 2.0 mg/L urine at the end of exposure or end of shift S-phenyl mercapturic acid: 0.045 mg/g creatinine urine at the end of exposure or end of shift		Phenol: 25 µg/g creatinine urine end of shift		S-Phenylmercapturic acid: 25 µg/g creatinine urine end of shift total Phenol: 50 mg/L urine end of shift

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available.

Exposure controls

Engineering Measures Use only under a chemical fume hood Ensure that eyewash stations and safety showers are close to the workstation location Use explosion-proof electrical/ventilating/lighting/equipment

Personal protective equipment

Eye Protection Safety glasses with side-shields

Hand Protection Protective gloves

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls No information available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Clear Colorless
odor	aromatic
pH	No information available.
Vapor Pressure	75 mmHg @ 20 °C
Vapor Density	2.8 (Air = 1.0)
Boiling Point/Range	80.1°C / 176.2°F
Melting Point/Range	5.5°C / 41.9°F
Flash Point	-11°C / 12.2°F
Autoignition Temperature	498°C / 928.4°F
Explosion Limits	
Lower	1.3%
Upper	7.1%
Evaporation Rate	No information available.
Water Solubility	0.18 g/100 ml @ 25 °C
Specific Gravity	0.8765 @ 20°C
Molecular Formula	C6H6
Molecular Weight	78.11

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Chemical Stability

Stable under normal conditions.

Possibility of Hazardous Reactions

Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions .	None under normal processing..

Conditions to Avoid

Incompatible products, Excess heat, Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials

Strong oxidizing agents.

Hazardous Decomposition Products

Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

Acute Toxicity

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Benzene	1800 mg/kg (Rat)		13050-14380 ppm (Rat) 4 h

Chronic Toxicity

Carcinogenicity May cause cancer

Component	IARC	UK
Benzene	Group 1	

Sensitization No information available.
Mutagenic Effects May cause heritable genetic damage
Reproductive Effects No information available.
Developmental Effects No information available.
Target Organs Bone marrow, hematopoietic system, blood, reproductive system, digestive system, and kidneys
Endocrine Disruptor Information None known

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity effects Contains no substances known to be hazardous to the environment or that are not degradable in waste water treatment plants

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea

Benzene	29 mg/L EC50 = 72 h	22.49 mg/L LC50 96 h 28.6 mg/L LC50 96 h 5.3 mg/L LC50 96 h 10.7-14.7 mg/L LC50 96 h 22330-41160 µg/L LC50 96 h 70000-142000 µg/L LC50 96 h		10 mg/L EC50 = 48 h 8.76 - 15.6 mg/L EC50 48 h

Persistence and degradability

No information available

Bioaccumulative potential

No information available.

Component	log Pow
Benzene	1.83

Mobility in soil

No information available.

Results of PBT and vPvB assessment

Other adverse effects

No information available

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from Residues / Unused Products Dispose of in accordance with local regulations

Contaminated Packaging Empty containers should be taken to local recyclers for disposal

SECTION 14. TRANSPORT INFORMATION

IMDG/IMO

UN-No UN1114
Hazard Class 3
Packing Group II

SECTION 14. TRANSPORT INFORMATION

ADR

UN-No	UN1114
Hazard Class	3
Packing Group	II

IATA

UN-No	UN1114
Hazard Class	3
Packing Group	II

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	CHINA	AICS	KECL
Benzene	200-753-7	-		X	X	-	X	X	X	X	X

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japan Existing and New Chemical Substances
CHINA - China Inventory of Existing Chemical Substances
AICS - Inventory of Chemical Substances
KECL - Existing and Evaluated Chemical Substances

Chemical Safety Assessment

SECTION 16. OTHER INFORMATION

Full text of R-phrases referred to under sections 2 and 3
No information available.

SECTION 16. OTHER INFORMATION

Revision Date 05-Dec-2011
Revision Summary Not applicable
This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006
Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet

SAFETY DATA SHEET

Version 5.8
Revision Date 02/02/2018
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[*a*]pyrene

Product Number : 48564
Brand : Supelco
Index-No. : 601-032-00-3

CAS-No. : 50-32-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin sensitisation (Category 1), H317
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 1B), H360
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	3,4-Benzpyrene 3,4-Benzopyrene Benzo[def]chrysene benzo[pqr]tetraphene
Formula	:	$C_{20}H_{12}$
Molecular weight	:	252.31 g/mol
CAS-No.	:	50-32-8
EC-No.	:	200-028-5
Index-No.	:	601-032-00-3

Hazardous components

Component	Classification	Concentration
Benzo[a]pyrene		
	Skin Sens. 1; Muta. 1B; Carc. 1B; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H317, H340, H350, H360, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low		

		as possible. Suspected human carcinogen		
		Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
Benzo[a]pyrene	50-32-8	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis

				specimen	
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: solid

b) Odour — No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 177 - 180 °C (351 - 356 °F)
f)	Initial boiling point and boiling range	495 °C (923 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.35 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5.97
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Subcutaneous - Rat - 50 mg/kg

Skin corrosion/irritation
Skin - Mouse
Result: Mild skin irritation

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
Chronic exposure may cause dermatitis.

Germ cell mutagenicity
May alter genetic material.
In vivo tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Benzo[a]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benzo[a]pyrene)
OSHA:	OSHA specifically regulated carcinogen (Benzo[a]pyrene)

Reproductive toxicity
May cause congenital malformation in the fetus.
Presumed human reproductive toxicant

May cause reproductive disorders.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.25 mg/l - 48 h
Toxicity to algae	EC50 - Pseudokirchneriella subcapitata (green algae) - 0.02 mg/l - 72 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 48 h - 0.0005 mg/l
	Bioconcentration factor (BCF): 3,208

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Benzo[a]pyrene)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[a]pyrene)
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[a]pyrene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date

Benzo[a]pyrene	50-32-8	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H317	May cause an allergic skin reaction.
H340	May cause genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Muta.	Germ cell mutagenicity

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 02/02/2018 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>b</>]fluoranthene

Product Number : 48490
Brand : Supelco
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzofluoranthene

Formula : C<SB>20</>H<SB>12</>
Molecular weight : 252.31 g/mol
CAS-No. : 205-99-2
EC-No. : 205-911-9
Index-No. : 601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benz[e]acephenanthrylene	205-99-2	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 163 - 165 °C (325 - 329 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
TDLo Oral - Mouse - 7.57 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[e]acephenanthrylene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[e]acephenanthrylene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	205-99-2	2007-09-28
Benz[e]acephenanthrylene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350 May cause cancer.

H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/16/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>k</>]fluoranthene

Product Number : 48492
Brand : Supelco
Index-No. : 601-036-00-5

CAS-No. : 207-08-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C<SB>20</>H<SB>12</>
Molecular weight	:	252.31 g/mol
CAS-No.	:	207-08-9
EC-No.	:	205-916-6
Index-No.	:	601-036-00-5

Hazardous components

Component	Classification	Concentration
Benzo[k]fluoranthene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[k]fluoranthene	207-08-9	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Personal protective equipment
Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Colour: yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 215 - 217 °C (419 - 423 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available

m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Carcinogenicity- Rat- Implant

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benzo[k]fluoranthene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benzo[k]fluoranthene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: DF6350000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benzo[k]fluoranthene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Reportable Quantity (RQ) : 5000 lbs

no
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[k]fluoranthene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	207-08-9	2007-09-28
Benzo[k]fluoranthene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information
Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/16/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benz[*a*]anthracene

Product Number : 48563
Brand : Supelco
Index-No. : 601-033-00-9

CAS-No. : 56-55-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,2-Benzanthracene Tetraphene
Formula	:	C<SB>18</>H<SB>12</>
Molecular weight	:	228.29 g/mol
CAS-No.	:	56-55-3
EC-No.	:	200-280-6
Index-No.	:	601-033-00-9

Hazardous components

Component	Classification	Concentration
Benz[a]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 157 - 159 °C (315 - 318 °F)
f)	Initial boiling point and boiling range	437.6 °C (819.7 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available

n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
LD50 Intravenous - Rat - > 200 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[a]anthracene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[a]anthracene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[a]anthracene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28
WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.7
Revision Date 02/07/2023
Print Date 02/17/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : BENZO(GHI)PERYLENE

Product Number : 12740
Brand : Sigma-Aldrich
CAS-No. : 191-24-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Warning

Hazard statement(s)
H410 Very toxic to aquatic life with long lasting effects.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Precautionary statement(s)

P273	Avoid release to the environment.
P391	Collect spillage.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,12-Benzoperylene

Formula : $C_{22}H_{12}$
Molecular weight : 276.33 g/mol
CAS-No. : 191-24-2
EC-No. : 205-883-8

Component	Classification	Concentration
Benzo[ghi]perylene		
	Aquatic Acute 1; Aquatic Chronic 1; H400, H410 M-Factor - Aquatic Acute: 1,000 - Aquatic Chronic: 1,000	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Consult a physician. Show this material safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Advice on protection against fire and explosion
Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place.

Light sensitive. Store under inert gas.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Storage class
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Benzo[ghi]perylene	191-24-2	PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[ghi]perylene	191-24-2	1-Hydroxypyrene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		3-hydroxybenzo(a)pyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 276 - 279 °C (529 - 534 °F)
f)	Initial boiling point and boiling range	> 500 °C > 932 °F - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available

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operates as MilliporeSigma in the US and Canada

m)	Density	No data available
	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 6.22 at 25 °C (77 °F)
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 0.0002 mg/l - 48 h
Toxicity to algae	Growth rate EC10 - Pseudokirchneriella subcapitata (green algae) - > 0.0016 mg/l - 72 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

12.7 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[ghi]perylene)
Marine pollutant : yes
Marine pollutant : no

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[ghi]perylene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2020-07-14

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2020-07-14

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2020-07-14

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.Benzo[ghi]perylene	191-24-2	2007-09-28

SECTION 16: Other information

Further information

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Version: 6.7 Revision Date: 02/07/2023 Print Date: 02/17/2023

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Safety Data Sheet
acc. to OSHA HCS

Printing date 02/10/2017 Reviewed on 02/10/2017

1 Identification

· **Product identifier**

· **Product Name: beta-BHC**

· **Part Number:** S-475
· **Application of the substance / the mixture** Certified Reference Material

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
SPEX CertiPrep, LLC.
203 Norcross Ave, Metuchen,
NJ 08840 USA

· **Information department:** product safety department
· **Emergency telephone number:**
Emergency Phone Number (24 hours)
CHEMTREC (800-424-9300)
Outside US: 703-527-3887

2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Tox. 3 H331 Toxic if inhaled.



GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
STOT SE 1 H370 Causes damage to organs.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS06 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
methanol
(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane
· **Hazard statements**
H225 Highly flammable liquid and vapor.
H331 Toxic if inhaled.
H351 Suspected of causing cancer.
H370 Causes damage to organs.
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dust/fume/gas/mist/vapors/spray.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
67-56-1	methanol	99.9%
319-85-7	(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane	0.1%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
· **After inhalation:**
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Do not induce vomiting; immediately call for medical help.
· **Information for Doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, sand, extinguishing powder. Do not use water.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents

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· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**		
67-56-1	methanol	530 ppm

· **PAC-2:**		
67-56-1	methanol	2,100 ppm

· **PAC-3:**		
67-56-1	methanol	7200* ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

67-56-1 methanol	
PEL	Long-term value: 260 mg/m³, 200 ppm
REL	Short-term value: 325 mg/m³, 250 ppm Long-term value: 260 mg/m³, 200 ppm Skin
TLV	Short-term value: 328 mg/m³, 250 ppm Long-term value: 262 mg/m³, 200 ppm Skin; BEI

· **Ingredients with biological limit values:**	
67-56-1 methanol	
BEI	15 mg/L Medium: urine Time: end of shift Parameter: Methanol (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.

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· **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	According to product specification
· **Odor:**	Characteristic
· **Odour Threshold:**	Not applicable.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	64 °C (147 °F)
· **Flash point:**	11 °C (52 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	455 °C (851 °F)
· **Decomposition temperature:**	Not applicable.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	5.5 Vol %
Upper:	44.0 Vol %
· **Vapor pressure at 20 °C (68 °F):**	128 hPa (96 mm Hg)
· **Density at 20 °C (68 °F)**	0.78921 g/cm³ (6.586 lbs/gal)
· **Relative density**	Not applicable.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not applicable.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	99.9 %

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VOC content:	99.9 %
Solids content:	0.1 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
67-56-1 methanol		
Oral	LD50	5628 mg/kg (rat)
Dermal	LD50	15800 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Toxic

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
319-85-7	(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane	2B

· **NTP (National Toxicology Program)**		
319-85-7	(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane	R

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

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· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**
· **DOT, ADR, IMDG, IATA** UN1230

· **UN proper shipping name**
· **DOT** Methanol
· **ADR** 1230 Methanol
· **IMDG, IATA** METHANOL

· **Transport hazard class(es)**

· **DOT**



· **Class** 3 Flammable liquids
· **Label** 3, 6.1

· **ADR**



· **Class** 3 Flammable liquids
· **Label** 3+6.1

· **IMDG**



· **Class** 3 Flammable liquids
· **Label** 3/6.1

· **IATA**



· **Class** 3 Flammable liquids
· **Label** 3 (6.1)

· **Packing group**
· **DOT, ADR, IMDG, IATA** II

· **Environmental hazards:** Not applicable.

· **Special precautions for user** Warning: Flammable liquids
· **Danger code (Kemler):** 336
· **EMS Number:** F-E,S-D
· **Stowage Category** B
· **Stowage Code** SW2 Clear of living quarters.

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

· **Transport/Additional information:**

· **ADR**
· **Excepted quantities (EQ)** Code: E2
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

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· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1230 METHANOL, 3 (6.1), II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

67-56-1	methanol

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

319-85-7	(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

67-56-1	methanol

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

319-85-7	(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane	C

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS06 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
methanol
(1alpha,2β,3alpha,4β,5alpha,6β)-1,2,3,4,5,6-hexachlorocyclohexane
· **Hazard statements**
H225 Highly flammable liquid and vapor.
H331 Toxic if inhaled.
H351 Suspected of causing cancer.
H370 Causes damage to organs.
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dust/fume/gas/mist/vapors/spray.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** product safety department
· **Contact:**
SPEX CertiPrep, LLC.
1-732-549-7144
· **Date of preparation / last revision** 02/10/2017 / -
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Carc. 2: Carcinogenicity – Category 2
STOT SE 1: Specific target organ toxicity (single exposure) – Category 1

SAFETY DATA SHEET

Version 8.1
Revision Date 07/16/2021
Print Date 03/01/2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Cadmium

Product Number : GF88365640
Brand : Aldrich
CAS-No. : 7440-43-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 1A), H350
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H350 May cause cancer.

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H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Molecular weight : 112.41 g/mol
CAS-No. : 7440-43-9

Component	Classification	Concentration
Cadmium		
	Carc. 1A; Aquatic Acute 1; Aquatic Chronic 1; H350, H400, H410 M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

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4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Cadmium/cadmium oxides
Not combustible.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

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7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Cadmium	7440-43-9	TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	0.3 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	0.6 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		PEL	0.005 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Remarks	Potential Occupational Carcinogen		
		TWA	0.01 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Suspected human carcinogen		
		TWA	0.002 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Suspected human carcinogen		
		PEL	0.005 mg/m3	OSHA Specifically Regulated Chemicals/Carcinogens
		OSHA specifically regulated carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Cadmium	7440-43-9	cadmium	5 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical			
		cadmium	5µg/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
		Not critical			

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8.2 Exposure controls

Appropriate engineering controls
Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Foil
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	()Not applicable

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h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The product is not flammable.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	No data available
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
acids

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: 1 - Group 1: Carcinogenic to humans (Cadmium)

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Damage to the lungs., Kidney injury may occur., prolonged or repeated exposure can cause:, Vomiting, Diarrhea, Lung irritation
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
The methods for determining the biological degradability are not applicable to inorganic substances.

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12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

Further information
Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Cadmium	7440-43-9	2007-07-01

Reportable Quantity : D006 lbs

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Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 8.1 Revision Date: 07/16/2021 Print Date: 03/01/2022

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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 2 Reviewed on 03/24/2019

*

1 Identification

· **Product identifier**

· **Trade name: Carbon Disulfide**

· **Part number:** RCC-175
· **CAS Number:**
75-15-0
· **EC number:**
200-843-6
· **Index number:**
006-003-00-3
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Repr. 2 H361 Suspected of damaging fertility or the unborn child.
STOT RE 1 H372 Causes damage to organs through prolonged or repeated exposure.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).

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Trade name: Carbon Disulfide

(Contd. of page 1)

· **Hazard pictograms**



GHS02 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
carbon disulphide

· **Hazard statements**
Highly flammable liquid and vapor.
Harmful if swallowed or if inhaled.
Causes skin irritation.
Causes serious eye irritation.
Suspected of damaging fertility or the unborn child.
Causes damage to organs through prolonged or repeated exposure.

· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Get medical advice/attention if you feel unwell.
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Carbon Disulfide

(Contd. of page 2)

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
75-15-0 carbon disulphide
· **Identification number(s)**
· **EC number:** 200-843-6
· **Index number:** 006-003-00-3

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

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5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
During heating or in case of fire poisonous gases are produced.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
13 ppm
· **PAC-2:**
160 ppm
· **PAC-3:**
480 ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.

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Safety Data Sheet
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(Contd. of page 4)

· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

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8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
75-15-0 carbon disulphide	
PEL	Long-term value: 20 ppm Ceiling limit value: 30; 100* ppm *30-min peak per 8-hr shift
REL	Short-term value: 30 mg/m³, 10 ppm Long-term value: 3 mg/m³, 1 ppm Skin
TLV	Long-term value: 3.13 mg/m³, 1 ppm Skin, BEI

· **Ingredients with biological limit values:**	
75-15-0 carbon disulphide	
BEI	0.5 mg/g creatinine Medium: urine Time: end of shift Parameter: 2-Thioxothiazolidine-4-carboxylic acid (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

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(Contd. of page 5)

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Unpleasant
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-111.5 °C (-168.7 °F)
Boiling point/Boiling range:	46.3 °C (115.3 °F)
· **Flash point:**	-30 °C (-22 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	95 °C (203 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	1 Vol %
Upper:	60 Vol %
· **Vapor pressure at 20 °C (68 °F):**	296.2 hPa (222.2 mm Hg)
· **Density at 20 °C (68 °F):**	1.266 g/cm³ (10.56477 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.

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Trade name: Carbon Disulfide

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· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	2.2 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	1,200 mg/kg (rat)
Inhalative	LC50/4 h	10.4 mg/L (rat)

75-15-0 carbon disulphide

Oral	LD50	1,200 mg/kg (rat)
Inhalative	LC50/4 h	10.35 mg/L (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

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Trade name: Carbon Disulfide

(Contd. of page 7)

· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1131
· **UN proper shipping name**	
· **DOT**	Carbon disulfide
· **IMDG, IATA**	CARBON DISULPHIDE
· **Transport hazard class(es)**	
· **DOT**	



· **Class**	3 Flammable liquids

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Safety Data Sheet
acc. to OSHA HCS

Trade name: Carbon Disulfide

(Contd. of page 8)

· **Label**	3, 6.1
· **IMDG**	
	
· **Class**	3 Flammable liquids
· **Label**	3/6.1
· **IATA**	
	
· **Class**	3 Flammable liquids
· **Label**	3 (6.1)
· **Packing group**	
· **DOT, IMDG, IATA**	I
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	336
· **EMS Number:**	3-01
· **Stowage Category**	D
· **Stowage Code**	SW2 Clear of living quarters.
· **Segregation Code**	SG63 Stow "separated longitudinally by an intervening complete compartment or hold from" Class 1.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: Forbidden On cargo aircraft only: Forbidden
· **Hazardous substance:**	100 lbs, 45.4 kg
· **IMDG**	
· **Limited quantities (LQ)**	0
· **Excepted quantities (EQ)**	Code: E0 Not permitted as Excepted Quantity
· **UN "Model Regulation":**	UN 1131 CARBON DISULPHIDE, 3 (6.1), I

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acc. to OSHA HCS

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is listed.

· **Chemicals known to cause developmental toxicity:**
Substance is listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)

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Trade name: Carbon Disulfide

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LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Repr. 2: Reproductive toxicity – Category 2
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.7
Revision Date 02/07/2023
Print Date 02/15/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Chloromethane

Product Number : 295507
Brand : Aldrich
Index-No. : 602-001-00-7
CAS-No. : 74-87-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, Liver, Urogenital tract, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



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Signal Word	Danger
Hazard statement(s)	
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs (Central nervous system, Liver, Urogenital tract) through prolonged or repeated exposure if inhaled.
Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P260	Do not breathe gas.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P405	Store locked up.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Methyl chloride
Formula	:	CH_3Cl
Molecular weight	:	50.49 g/mol
CAS-No.	:	74-87-3
EC-No.	:	200-817-4
Index-No.	:	602-001-00-7

Component	Classification	Concentration
methyl chloride		
	Flam. Gas 1; Press. Gas Liquefied gas; Carc. 2; Repr. 2; STOT RE 2; H220, H280, H351, H361, H373	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Hydrogen chloride gas
Combustible.
Pay attention to flashback.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe gas. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Stop flow of gas, move leaking cylinder to open air if without risk.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from combustible materials and sources of ignition.

Contents under pressure. Moisture sensitive.

Storage class
Storage class (TRGS 510): 2A: Gases

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
methyl chloride	74-87-3	TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		

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		Danger of cutaneous absorption		
		STEL	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Not classifiable as a human carcinogen Danger of cutaneous absorption		
		Potential Occupational Carcinogen		
		TWA	100 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		STEL	100 ppm 210 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	50 ppm 105 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/mists are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance — Form: compressed liquefied gas

b) Odor — No data available

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c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -97 °C (-143 °F) - lit.
f)	Initial boiling point and boiling range	-24.2 °C -11.6 °F - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 17.4 %(V) Lower explosion limit: 7 %(V)
k)	Vapor pressure	5,060.9 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	No data available
m)	Density	0.915 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	5.32 g/l at 25 °C (77 °F) - soluble
o)	Partition coefficient: n-octanol/water	log Pow: 0.91 at 25 °C (77 °F) - Bioaccumulation is not expected., (ECHA)
p)	Autoignition temperature	632.0 °C (1169.6 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	0.02 mN/m at 20 °C (68 °F)

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, flames and sparks.
no information available

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10.5 Incompatible materials
Strong oxidizing agents, Iron

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
LC50 Inhalation - Rat - male and female - 4 h - > 21,800 mg/m3 - vapor

(OECD Test Guideline 403)
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: gene mutation test
Test system: human lymphoblastoid cells
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 476
Result: positive

Carcinogenicity
Limited evidence of a carcinogenic effect.

IARC:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Suspected human reproductive toxicant Suspected of damaging fertility. Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Inhalation - May cause damage to organs through prolonged or repeated exposure.
- Central nervous system, Liver, Urogenital tract

Aspiration hazard
No data available

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11.2 Additional Information

RTECS: PA6300000
Dizziness, Drowsiness, Incoordination., Blurred vision, Headache, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

No data available

Toxicity to daphnia and other aquatic invertebrates	semi-static test EC50 - Daphnia magna (Water flea) - 200 mg/l - 48 h (OECD Test Guideline 202)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 h Result: 100 % - Readily biodegradable. Remarks: (ECHA)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. Pressurised gas bottle: dispose of only in empty condition!

SECTION 14: Transport information

DOT (US)

UN number: 1063 Class: 2.1

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Proper shipping name: Methyl chloride
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1063 Class: 2.1 EMS-No: F-D, S-U
Proper shipping name: METHYL CHLORIDE

IATA
UN number: 1063 Class: 2.1
Proper shipping name: Methyl chloride
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
methyl chloride	74-87-3	2013-02-08

SARA 311/312 Hazards
Fire Hazard, Sudden Release of Pressure Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
methyl chloride	74-87-3	2013-02-08

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
methyl chloride	74-87-3	2013-02-08

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.methyl chloride	74-87-3	2009-09-11

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See

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Version: 6.7 Revision Date: 02/07/2023 Print Date: 02/15/2023

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SAFETY DATA SHEET

Version 6.11
Revision Date 04/24/2025
Print Date 04/24/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Chromium

Product Number : 266264
Brand : Aldrich
CAS-No. : 7440-47-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a hazardous substance or mixture.

Other hazards

None known.

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GHS label elements

Not a hazardous substance or mixture.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
chromium	7440-47-3*	>= 90 - <= 100	-

* Indicates that the identifier is a CAS No.
Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : After inhalation: fresh air.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact : After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed : After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

Most important symptoms and effects, both acute and delayed : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Protection of first-aiders : For personal protection see section 8.

Notes to physician : No data available

SECTION 5. FIRE-FIGHTING MEASURES

Unsuitable extinguishing media : For this substance/mixture no limitations of extinguishing agents are given.

Hazardous combustion products : Chromium oxides

Specific extinguishing methods : No data available

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Further information	:	none
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	:	No special precautionary measures necessary.
Methods and materials for containment and cleaning up	:	Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Further information on storage conditions	:	Tightly closed. Dry.
Storage class	:	11, Combustible Solids
Recommended storage temperature	:	Recommended storage temperature see product label.
Further information on storage stability	:	Air sensitive.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
chromium	7440-47-3	TWA	0.5 mg/m3 (chromium)	ACGIH

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		TWA	1 mg/m3 (chromium)	OSHA Z-1

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
chromium	7440-47-3	Total chromium (chromium)	Urine	End of shift at end of workweek	0.7 µg/l	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P1

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Manufacturer : data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

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Remarks	:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Eye protection	:	Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Hygiene measures	:	Change contaminated clothing. Wash hands after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder
Color	:	light gray
Odor	:	odorless
Odor Threshold	:	No data available
pH	:	No data available
Melting point/ range	:	3,375 °F / 1,857 °C Method: lit.
Boiling point/boiling range	:	4,842 °F / 2,672 °C Method: lit.
Flash point	:	Not applicable
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Flammability (liquids)	:	No data available

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Burning rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	No data available
Density	:	7.14 g/mL (77 °F / 25 °C) Method: lit.
Solubility(ies) Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	Not applicable for inorganic substances
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	none
Molecular weight	:	52.00 g/mol
Particle characteristics Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No data available
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .

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Possibility of hazardous reactions	:	No data available
Conditions to avoid	:	no information available
Incompatible materials	:	Strong acids Strong oxidizing agents
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Remarks: No data available

Serious eye damage/eye irritation
Remarks: No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: GB4200000

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To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

chromium:

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): 14.3 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.07 mg/l Exposure time: 48 h

Persistence and degradability

Components:

chromium:

Biodegradability	:	Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Bioaccumulative potential

Components:

chromium:

Bioaccumulation	:	Species: Oncorhynchus mykiss (rainbow trout) Bioconcentration factor (BCF): 1.03 - 1.22 Exposure time: 30 d Concentration: 50 µg/l
Partition coefficient: n-octanol/water	:	Remarks: Not applicable for inorganic substances

Mobility in soil

Components:

chromium:

Stability in soil	:	Remarks: No data available

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Other adverse effects

Components:

chromium:

Additional ecological information	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to IMO instruments
Not applicable for product as supplied.

National regulation

49 CFR Road

UN/ID/NA number	:	UN 3077
Proper shipping name	:	Environmentally hazardous substance, solid, n.o.s. (chromium)
Class	:	9
Packing group	:	III
Labels	:	Class 9 - Miscellaneous dangerous substances and articles
ERG Code	:	171
Marine pollutant	:	no
Poison Inhalation Hazard	:	No

Special precautions for user

Remarks	:	Not classified as dangerous in the meaning of transport regulations.

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety

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Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
chromium	7440-47-3	5000	5000

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

chromium 7440-47-3 >= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

chromium 7440-47-3

Pennsylvania Right To Know

chromium 7440-47-3

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for

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Revision Date : 04/24/2025

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US / EN

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SAFETY DATA SHEET

Version 5.10
Revision Date 01/10/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : CHRYSENE, 98%

Product Number : 245186
Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H341	Suspected of causing genetic defects.
H350	May cause cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : $C_{18}H_{12}$

Molecular weight : 228.29 g/mol

Hazardous components

Component	Classification	Concentration
Chrysene		
	Muta. 2; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H341, H350, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Confirmed animal carcinogen with unknown relevance to humans		
Chrysene	218-01-9	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C		

		See Appendix A		
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

		Colour: white, light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	253.0 °C (487.4 °F)
f)	Initial boiling point and boiling range	448.0 °C (838.4 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 5.73
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - > 320 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Chrysene)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	OSHA specifically regulated carcinogen (Chrysene)

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1.90 mg/l - 2 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Chrysene)
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Chrysene)
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Chrysene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Chrysene	218-01-9	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10 Revision Date: 01/10/2018 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 03/12/2019
Print Date 06/22/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Copper

Product Number : 31284
Brand : Aldrich
CAS-No. : 7440-50-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : Cu
Molecular weight : 63.55 g/mol
CAS-No. : 7440-50-8
EC-No. : 231-159-6

Component	Classification	Concentration

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Copper,		
		<= 100 %

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Copper oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions
No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

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6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store under inert gas. Air sensitive.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Copper,	7440-50-8	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Irritation Gastrointestinal metal fume fever		
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		

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		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
General industrial hygiene practice.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
No special environmental precautions required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Wire Colour: light red
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,083.4 °C (1,982.1 °F)
f)	Initial boiling point and boiling range	2,567 °C 4,653 °F
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	8.940 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

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SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Copper oxides
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
LD50 Intraperitoneal - Mouse - 3.5 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

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Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: GL5325000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

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SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

New Jersey Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1 Revision Date: 03/12/2019 Print Date: 06/22/2019

The life science business of Merck KGaA, Darmstadt, Germany
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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: Cyclohexane**

· **Part number:** WRK-104D
· **CAS Number:**
110-82-7
· **EC number:**
203-806-2
· **Index number:**
601-017-00-1
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS08 Health hazard

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.


GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07 GHS08

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 03/25/2019

Trade name: Cyclohexane

(Contd. of page 1)

· **Signal word** Danger

· **Hazard-determining components of labeling:**
cyclohexane
· **Hazard statements**
Highly flammable liquid and vapor.
Harmful if inhaled.
Causes skin irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
Specific treatment (see on this label).
Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a poison center/doctor if you feel unwell.
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 3)

Safety Data Sheet
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(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
110-82-7 cyclohexane
· **Identification number(s)**
· **EC number:** 203-806-2
· **Index number:** 601-017-00-1

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

*
5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.

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(Contd. of page 3)

See Section 13 for disposal information.

· **Protective Action Criteria for Chemicals**

· **PAC-1:**
300 ppm
· **PAC-2:**
1700* ppm
· **PAC-3:**
10000** ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
110-82-7 cyclohexane	
PEL	Long-term value: 1050 mg/m³, 300 ppm
REL	Long-term value: 1050 mg/m³, 300 ppm
TLV	Long-term value: 344 mg/m³, 100 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the skin.
Avoid contact with the eyes and skin.

(Contd. on page 5)

(Contd. of page 4)

· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Sweetish
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	6.4 °C (43.5 °F)
Boiling point/Boiling range:	81 °C (177.8 °F)
· **Flash point:**	-20 °C (-4 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	260 °C (500 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

(Contd. on page 6)

(Contd. of page 5)

· **Explosion limits:**	
Lower:	1.2 Vol %
Upper:	8.3 Vol %
· **Vapor pressure at 20 °C (68 °F):**	75 hPa (56.3 mm Hg)
· **Density at 20 °C (68 °F):**	0.81 g/cm³ (6.75945 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.05 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 20 °C (68 °F):	0.94 mPas
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 %
	810.0 g/l / 6.76 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Dermal	LD50	>2,000 mg/kg (rabbit)
Inhalative	LC50/4 h	13.9 mg/L (rat)

110-82-7 cyclohexane		
Oral	LD50	>5,000 mg/kg (rat)
Dermal	LD50	>2,000 mg/kg (rabbit)
Inhalative	LC50/4 h	13.9 mg/L (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** No irritating effect.

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(Contd. of page 6)

· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **NTP (National Toxicology Program)**
Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1145

· **UN proper shipping name**	
· **DOT**	Cyclohexane
· **IMDG, IATA**	CYCLOHEXANE

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Trade name: Cyclohexane

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· **Transport hazard class(es)**

· **DOT, IMDG, IATA**



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-07
· **Stowage Category**	E
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	1000 lbs, 454 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1145 CYCLOHEXANE, 3, II, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

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Safety Data Sheet
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· **Proposition 65**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

· **Chemicals known to cause developmental toxicity:**

Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

I

· **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 2
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
Asp. Tox. 1: Aspiration hazard – Category 1
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.9
Revision Date 06/26/2025
Print Date 06/27/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Dibenzofuran

Product Number : 236373
Brand : Aldrich
CAS-No. : 132-64-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

Short-term (acute) aquatic hazard : Category 2

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Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H302 Harmful if swallowed.
H401 Toxic to aquatic life.

Precautionary statements :

Prevention:

P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Dibenzofuran	132-64-9*	>= 80 - <= 100	TSC

* Indicates that the identifier is a CAS No.
TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air.

In case of skin contact : In case of skin contact: Take off immediately all

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contaminated clothing. Rinse skin with water/ shower.

In case of eye contact	:	After eye contact: rinse out with plenty of water. Remove contact lenses.
If swallowed	:	After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
Most important symptoms and effects, both acute and delayed	:	The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11
Protection of first-aiders	:	For personal protection see section 8.
Notes to physician	:	No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water Foam Carbon dioxide (CO2) Dry powder
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Combustible. Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air on intense heating. Development of hazardous combustion gases or vapours possible in the event of fire.
Hazardous combustion products	:	Carbon oxides
Specific extinguishing methods	:	No data available

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Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	:	Do not let product enter drains.
Methods and materials for containment and cleaning up	:	Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Further information on storage conditions	:	Tightly closed. Dry.
Storage class	:	11, Combustible Solids
Recommended storage temperature	:	Recommended storage temperature see product label.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures : No data available

Personal protective equipment

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Respiratory protection	:	required when dusts are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Recommended Filter type:	:	Filter type P2

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Manufacturer	:	data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
Remarks	:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Eye protection	:	Use equipment for eye protection tested and

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		approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Skin and body protection	:	protective clothing
Hygiene measures	:	Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder, finecrystalline
Color	:	white, beige
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point/ range	:	176 - 180 °F / 80 - 82 °C Method: lit.
Boiling point/boiling range	:	309 - 311 °F / 154 - 155 °C (27 hPa) Method: lit.
Flash point	:	266 °F / 130 °C (1,013 hPa) Method: closed cup, closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Flammability (liquids)	:	No data available
Burning rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapour density	:	No data available

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Relative density	:	No data available
Density	:	1.3 g/cm3 (68 °F / 20 °C)
Solubility(ies) Water solubility	: :	 insoluble (68 °F / 20 °C)
Partition coefficient: n-octanol/water	:	log Pow: 4.12 Method: (experimental) (Lit.) Potential bioaccumulation
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	Not classified as explosive.
Oxidizing properties	:	none
Molecular weight	:	168.19 g/mol
Particle characteristics Particle size	: :	 No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Forms explosive mixtures with air on intense heating. A range from approx. 15 Kelvin below the flash point is to be rated as critical. The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Violent reactions possible with: Strong oxidizing agents
Conditions to avoid	:	Strong heating.

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Incompatible materials	:	No data available
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 500.1 mg/kg
(Expert judgement)
Remarks: The value / statement given is based on a (Q)SAR approach
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Hazardous properties cannot be excluded.

Handle in accordance with good industrial hygiene and safety practice.

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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Dibenzofuran:

Ecotoxicology Assessment

Acute aquatic toxicity	:	Toxic to aquatic life. Remarks: The value / statement given is based on a (Q)SAR approach
Chronic aquatic toxicity	:	This product has no known ecotoxicological effects. Remarks: The value / statement given is based on a (Q)SAR approach

Persistence and degradability

No data available

Bioaccumulative potential

Components:

Dibenzofuran:

Partition coefficient: n-octanol/water	:	log Pow: 4.12 Method: (experimental) Remarks: (Lit.) Potential bioaccumulation

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

Dibenzofuran:

Additional ecological information	:	No ecological problems are to be expected when the product is handled and used with due care and

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attention.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR Road

UN/ID/NA number	:	UN 3077
Proper shipping name	:	Environmentally hazardous substance, solid, n.o.s. (Dibenzofuran)
Class	:	9
Packing group	:	III
Labels	:	Class 9 - Miscellaneous dangerous substances and articles
ERG Code	:	171
Marine pollutant	:	no
Poison Inhalation Hazard	:	No

Special precautions for user

Remarks	:	Not classified as dangerous in the meaning of transport regulations.

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

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Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Dibenzofuran	132-64-9	100	100

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Dibenzofuran 132-64-9 >= 90 - <= 100 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

Dibenzofuran 132-64-9 >= 90 - <= 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

Dibenzofuran 132-64-9

Pennsylvania Right To Know

Dibenzofuran 132-64-9

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

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The components of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is

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applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
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Revision Date : 06/26/2025

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

US / EN

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1.Identification

Product name:	Dichlorodifluoromethane (CFC-12)
Catalog#:	9863AF
IUPAC name:	Not available.
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 3), Respiratory system

Pictogram(s)



Signal word:

Warning

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Precautionary statement(s):

P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a poison center or doctor if you feel unwell.
P321	Specific treatment (see supplemental first aid instructions on this label).
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	75-71-8
Purity:	Not available.
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.
Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.
Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.
Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.
Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.
Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Specific hazards arising from the chemical: .
Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.
Environmental precautions: Do not let product enter drains, other waterways, or soil.
Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.
Conditions for safe storage, including any incompatibilities: Store in a tightly-closed

container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: Not available.
NIOSH REL: Not available.
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes: Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.

Hands: Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.

Skin and body: Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.

Respiratory: Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Not available.
Molecular Formula:	Not Available.
Molecular Weight:	Not Available.
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	Not available.
Freezing/Melting Point:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	Not available.
Refractive Index:	Not available.
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	.

11. Toxicological Information

RTECS#	Not available.
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number:	Not hazardous material.
Proper shipping name:	Not available.
Transport hazard class:	Not available.
Packing group:	Not available.

IATA

UN Number:	Not dangerous good.
Proper shipping name:	Not available.
Transport hazard class:	Not available.
Packing group:	Not available.

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not Available..	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 02/25/2019
Printed Date: 02/14/2020

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Version 6.6
Revision Date 09/06/2022
Print Date 01/13/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Dieldrin

Product Number : 33491
Brand : Sigma-Aldrich
Index-No. : 602-049-00-9
CAS-No. : 60-57-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 2), H300
Acute toxicity, Dermal (Category 1), H310
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



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Signal Word	Danger
Hazard statement(s)	
H300 + H310	Fatal if swallowed or in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.
H410	Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P302 + P350 + P310	IF ON SKIN: Gently wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	1,2,3,4,10,10-Hexachloro-1,4,4a,5,6,7,8,8a-octahydro-6,7-epoxy-1,4:5,8-dimethanonaphthalene
Formula	:	$C_{12}H_8Cl_6O$
Molecular weight	:	380.91 g/mol
CAS-No.	:	60-57-1
EC-No.	:	200-484-5
Index-No.	:	602-049-00-9

Component	Classification	Concentration
Dieldrin		
	Acute Tox. 2; Acute Tox. 1; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H300, H310, H351, H372, H400, H410 M-Factor - Aquatic Acute: 100	<= 100 %

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	M-Factor - Aquatic Chronic: 10	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Hydrogen chloride gas
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

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5.4 Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class

Storage class (TRGS 510): 6.1A: Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

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Component	CAS-No.	Value	Control parameters	Basis
Dieldrin	60-57-1	TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	0.25 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen Potential for dermal absorption		
		TWA	0.25 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	0.25 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our

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customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
protective clothing

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 143 - 144 °C (289 - 291 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	No data available
	Relative density	No data available
n)	Water solubility	slightly soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available

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s) Explosive properties No data available

t) Oxidizing properties none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Strong oxidizing agents

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 38.3 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Acute toxicity estimate Dermal - 5.1 mg/kg
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Suspected of causing cancer.

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IARC: 2A - Group 2A: Probably carcinogenic to humans (Dieldrin)

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 Additional Information

RTECS: IO1750000
Discomfort, Headache, Nausea, Vomiting, Dizziness, Tremors, tonic convulsions, clonic spasms, Coma., respiratory failure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Blood - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Lepomis cyanellus - 0.011 mg/l - 96 h Remarks: (ECOTOX Database)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 2811 Class: 6.1 Packing group: I
Proper shipping name: Toxic solids, organic, n.o.s. (Dieldrin)
Reportable Quantity (RQ): 1 lbs
Marine pollutant: yes Poison Inhalation Hazard: No

IMDG
UN number: 2811 Class: 6.1 Packing group: I EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (Dieldrin)
Marine pollutant : yes

IATA
UN number: 2811 Class: 6.1 Packing group: I
Proper shipping name: Toxic solid, organic, n.o.s. (Dieldrin)
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to

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Version: 6.6 Revision Date: 09/06/2022 Print Date: 01/13/2024

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1.Identification

Product name:	Ethanol
Catalog#:	SOLVENT7
IUPAC name:	ethanol
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification

Flammable liquids (Category 2)
Eye irritation (Category 2A)

Pictogram:



Signal word:

Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.

Precautionary statement(s):

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353	-
P305 + P351 + P338	-
P337 + P313	-
P370 + P378	-
P403 + P235	-
P501	-

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	64-17-5

Purity:	Not available.
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.
Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.
Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.
Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.
Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.
Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Specific hazards arising from the chemical: Carbon oxides.
Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.
Environmental precautions: Do not let product enter drains, other waterways, or soil.
Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.
Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: Not available.
NIOSH REL: Not available.
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes: Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.

Hands: Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.

Skin and body: Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.

Respiratory: Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Pysical State:	Not available.
Molecular Formula:	C2H6O
Molecular Weight:	46.68
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	78 °C
Freezing/Melting Point:	-114 °C
Flash Point:	14.0 °C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	Not available.
Refractive Index:	Not available.
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.

Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	Not available.
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT(United States)

UN number:	UN1170
Proper shipping name:	Ethanol or Ethyl alcohol or Ethanol solutions or Ethyl alcohol solutions(Ethanol)
Transport hazard class:	3
Packing group:	II

IATA

UN Number:	UN1170
Proper shipping name:	Ethanol(Ethanol)
Transport hazard class:	3
Packing group:	II

15. Regulatory Information

TSCA Chemical Inventory:

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified

individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not listed.	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 02/25/2019
Printed Date: 3/28/2019

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Version 8.5
Revision Date 10/27/2023
Print Date 01/07/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Ethyl acetate

Product Number : W241415
Brand : Aldrich
Index-No. : 607-022-00-5
CAS-No. : 141-78-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



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Signal Word	Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing mist or vapors.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	$C_4H_8O_2$
Molecular weight	:	88.11 g/mol
CAS-No.	:	141-78-6
EC-No.	:	205-500-4
Index-No.	:	607-022-00-5

Component	Classification	Concentration
ethyl acetate		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319,	<= 100 %

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	H336 Concentration limits: 20 %: STOT SE 3, H336;	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

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5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
ethyl acetate	141-78-6	TWA	400 ppm	USA. ACGIH Threshold Limit Values (TLV)
		TWA	400 ppm 1,400 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	400 ppm 1,400 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	400 ppm 1,400 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Acute systemic effects	1468 mg/m3
Workers	Inhalation	Acute local effects	1468 mg/m3
Workers	Skin contact	Long-term systemic effects	63mg/kg BW/d
Workers	Inhalation	Long-term systemic effects	734 mg/m3
Workers	Inhalation	Long-term local effects	734 mg/m3
Consumers	Inhalation	Acute local effects, Acute systemic effects	734 mg/m3
Consumers	Skin contact	Long-term systemic effects	37mg/kg BW/d
Consumers	Inhalation	Long-term systemic effects	367 mg/m3
Consumers	Ingestion	Long-term systemic effects	4.5mg/kg BW/d
Consumers	Inhalation	Long-term local effects	367 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	0.24 mg/kg
Sea water	0.026 mg/l
Fresh water	0.26 mg/l
Sea sediment	0.125 mg/kg
Fresh water sediment	1.25 mg/kg

8.2 Exposure controls

Appropriate engineering controls

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

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Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 120 min
Material tested:Butoject® (KCL 898)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Color: colorless
b)	Odor	fruity
c)	Odor Threshold	0.1 ppm
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -84 °C (-119 °F) - lit.
f)	Initial boiling point and boiling range	76.5 - 77.5 °C 169.7 - 171.5 °F - lit.
g)	Flash point	-4 °C (25 °F) - closed cup
h)	Evaporation rate	No data available

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i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 11.5 %(V) Lower explosion limit: 2.1 %(V)
k)	Vapor pressure	No data available
l)	Vapor density	3.04
m)	Density	0.902 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 0.73 - Bioaccumulation is not expected., (Lit.)
p)	Autoignition temperature	No data available
q)	Decomposition temperature	Distillable in an undecomposed state at normal pressure.
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Relative vapor density	3.04

SECTION 10: Stability and reactivity

10.1 Reactivity

Vapors may form explosive mixture with air.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapours with:
Exothermic reaction with:
Fluorine
chlorosulfonic acid
Strong oxidizing agents
fuming sulfuric acid
Risk of explosion with:
lithium aluminium hydride
Alkali metals
hydrides
Alkaline earth metals
Violent reactions possible with:

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Strong acids and strong bases

10.4 Conditions to avoid
Warming.

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,620 mg/kg
Remarks: (RTECS)
Inhalation: No data available
LD50 Dermal - Rabbit - male - > 20,000 mg/kg
Remarks: (ECHA)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation
Remarks: (IUCLID)

Serious eye damage/eye irritation
Remarks: Causes serious eye irritation.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: UDS (Unscheduled DNA synthesis assay)
Test system: Escherichia coli
Metabolic activation: with and without metabolic activation
Method: US-EPA
Result: negative
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

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Test Type: Micronucleus test
Species: Chinese hamster
Cell type: Red blood cells (erythrocytes)
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness. - Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 92 Days - NOAEL (No observed adverse effect level) - 900 mg/kg - LOAEL (Lowest observed adverse effect level) - 3,600 mg/kg

RTECS: AH5425000
Inhalation of high concentrations may cause:, Headache, Drowsiness, Dizziness, Vomiting, narcosis, anemia, Central nervous system depression
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney - Irregularities - Based on Human Evidence

Kidney - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish flow-through test LC50 - Pimephales promelas (fathead minnow) -

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	230 mg/l - 96 h (US-EPA)
Toxicity to algae	static test NOEC - Desmodesmus subspicatus (green algae) - > 100 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Remarks: (IUCLID) (ethyl acetate)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - Daphnia magna (Water flea) - 2.4 mg/l - 21 d (OECD Test Guideline 211)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 20 d Result: ca.69 % - Readily biodegradable. Remarks: (ECHA)
Theoretical oxygen demand	1,820 mg/g Remarks: (Lit.)

12.3 Bioaccumulative potential

Bioaccumulation	Leuciscus idus melanotus - 3 Days at 22.5 °C(ethyl acetate) Bioconcentration factor (BCF): 30

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

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SECTION 14: Transport information

DOT (US)

UN number: 1173 Class: 3 Packing group: II
Proper shipping name: Ethyl acetate
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1173 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ETHYL ACETATE

IATA

UN number: 1173 Class: 3 Packing group: II
Proper shipping name: Ethyl acetate

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
ethyl acetate	141-78-6	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
ethyl acetate	141-78-6	1993-02-16

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See

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www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 8.5 Revision Date: 10/27/2023 Print Date: 01/07/2024

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SAFETY DATA SHEET

according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended

Creation Date 06-Aug-2010 **Revision Date** 11-Oct-2023 **Revision Number** 9

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Description:	**Ethylbenzene**
Cat No. :	**433800000; 433800010; 433801000**
Synonyms	Ethylbenzol; Phenylethane
Index No	601-023-00-4
CAS No	100-41-4
EC No	202-849-4
Molecular Formula	C8 H10
REACH registration number	-

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use	Laboratory chemicals.
Sector of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category	PC21 - Laboratory chemicals
Process categories	PROC15 - Use as a laboratory reagent
Environmental release category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against	No Information available

1.3. Details of the supplier of the safety data sheet

Company

UK entity/business name
Fisher Scientific UK
Bishop Meadow Road,
Loughborough, Leicestershire LE11 5RG, United Kingdom

EU entity/business name
Thermo Fisher Scientific
Janssen Pharmaceuticalaan 3a, 2440 Geel, Belgium

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No. **US:**001-800-424-9300 / **Europe:**001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Physical hazards

Flammable liquids	Category 2 (H225)
Health hazards	
Aspiration Toxicity	Category 1 (H304)
Acute Inhalation Toxicity - Vapors	Category 4 (H332)
Specific target organ toxicity - (repeated exposure)	Category 2 (H373)
Environmental hazards	
Chronic aquatic toxicity	Category 3 (H412)

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word **Danger**

Hazard Statements

H225 - Highly flammable liquid and vapor
H332 - Harmful if inhaled
H304 - May be fatal if swallowed and enters airways
H373 - May cause damage to organs through prolonged or repeated exposure
H412 - Harmful to aquatic life with long lasting effects

Precautionary Statements

P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331 - Do NOT induce vomiting
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P312 - Call a POISON CENTER or doctor if you feel unwell
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

Toxicity to Soil Dwelling Organisms
This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	CAS No	EC No	Weight %	CLP Classification - According to

				GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
Ethylbenzene	100-41-4	EEC No. 202-849-4	>95	Flam. Liq. 2 (H225) Asp. Tox. 1 (H304) Acute Tox. 4 (H332) STOT RE 2 (H373) Aquatic Chronic 3 (H412)

REACH registration number	-

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention. Aspiration into lungs can produce severe lung damage.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

4.2. Most important symptoms and effects, both acute and delayed

Difficulty in breathing. . Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: May cause central nervous system depression

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons
Water may be ineffective.

5.2. Special hazards arising from the substance or mixture

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Keep product and empty container away from heat and sources of ignition. Thermal decomposition can

lead to release of irritating gases and vapors.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO_2).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.

6.2. Environmental precautions

Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information. Collect spillage.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Flammables area.

Technical Rules for Hazardous Substances (TRGS) 510 Storage Class (LGK) (Germany) Class 3

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. **IRE -** 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
Ethylbenzene	STEL: 125 ppm 15 min STEL: 552 mg/m³ 15 min TWA: 100 ppm 8 hr TWA: 441 mg/m³ 8 hr Skin	TWA: 100 ppm (8h) TWA: 442 mg/m³ (8h) STEL: 200 ppm (15min) STEL: 884 mg/m³ (15min) Skin	TWA: 100 ppm 8 hr. TWA: 442 mg/m³ 8 hr. STEL: 200 ppm 15 min STEL: 884 mg/m³ 15 min Skin

Biological limit values
List source(s):

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)
See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
Ethylbenzene 100-41-4 (>95)				DNEL = 180mg/kg bw/day DNEL = 212mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Ethylbenzene 100-41-4 (>95)	DMEL = 884mg/m³ DNEL = 293mg/m³ DNEL = 442mg/m³	DMEL = 884mg/m³ DNEL = 442mg/m³	DMEL = 442mg/m³ DNEL = 221mg/m³	DMEL = 442mg/m³ DNEL = 77mg/m³ DNEL = 221mg/m³

Predicted No Effect Concentration (PNEC)
See values below.

Component	Fresh water	Fresh water sediment	Water Intermittent	Microorganisms in sewage treatment	Soil (Agriculture)
Ethylbenzene 100-41-4 (>95)	PNEC = 0.327mg/L	PNEC = 12.46mg/kg sediment dw	PNEC = 0.327mg/L	PNEC = 6.58mg/L	PNEC = 2.31mg/kg soil dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
Ethylbenzene 100-41-4 (>95)	PNEC = 0.327mg/L	PNEC = 12.46mg/kg sediment dw			

8.2. Exposure controls

Engineering Measures
Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting equipment.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber Neoprene Natural rubber PVC	See manufacturers recommendations	-	EN 374	(minimum requirement)

Skin and body protection Long sleeved clothing.

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Organic gases and vapours filter Type A Brown conforming to EN14387

Small scale/Laboratory use Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls Prevent product from entering drains. Do not allow material to contaminate ground water system.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State	Liquid	
Appearance	Colorless	
Odor	aromatic	
Odor Threshold	No data available	
Melting Point/Range	-95 °C / -139 °F	
Softening Point	No data available	
Boiling Point/Range	136 °C / 276.8 °F	
Flammability (liquid)	Highly flammable	On basis of test data
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	**Lower** 1 vol% **Upper** 7.8 vol%	
Flash Point	22 °C / 71 °F	**Method -** No information available

Autoignition Temperature	432 °C / 810 °F	
Decomposition Temperature	No data available	
pH	No information available	
Viscosity	No data available	
Water Solubility	0.2 g/L (20°C)	practically insoluble
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Component	**log Pow**	
Ethylbenzene	3.6	
Vapor Pressure	No data available	
Density / Specific Gravity	0.860	
Bulk Density	Not applicable	Liquid
Vapor Density	No data available	(Air = 1.0)
Particle characteristics	Not applicable (liquid)	

9.2. Other information

Molecular Formula	C8 H10
Molecular Weight	106.17
Explosive Properties	Vapors may form explosive mixtures with air

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

(a) acute toxicity;

Oral	Based on available data, the classification criteria are not met
Dermal	Based on available data, the classification criteria are not met
Inhalation	Category 4

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation

Ethylbenzene	3500 mg/kg (Rat)	15400 mg/kg (Rabbit)	17.2 mg/L (Rat) 4 h

(b) skin corrosion/irritation; Based on available data, the classification criteria are not met

(c) serious eye damage/irritation; Based on available data, the classification criteria are not met

(d) respiratory or skin sensitization;
Respiratory Based on available data, the classification criteria are not met
Skin Based on available data, the classification criteria are not met

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

(f) carcinogenicity; Based on available data, the classification criteria are not met

The table below indicates whether each agency has listed any ingredient as a carcinogen

Component	EU	UK	Germany	IARC
Ethylbenzene				Group 2B

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Based on available data, the classification criteria are not met

(i) STOT-repeated exposure; Category 2

Target Organs Ears.

(j) aspiration hazard; Category 1

Other Adverse Effects See actual entry in RTECS for complete information

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. May cause central nervous system depression.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects Do not empty into drains. The product contains following substances which are hazardous for the environment. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae
Ethylbenzene	LC50: 9.1 - 15.6 mg/L, 96h static (Pimephales promelas) LC50: 11.0 - 18.0 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 4.2 mg/L, 96h semi-static (Oncorhynchus	EC50: 1.8 - 2.4 mg/L, 48h (Daphnia magna)	EC50: 2.6 - 11.3 mg/L, 72h static (Pseudokirchneriella subcapitata) EC50: 1.7 - 7.6 mg/L, 96h static (Pseudokirchneriella subcapitata) EC50: > 438 mg/L, 96h

	mykiss) LC50: 7.55 - 11 mg/L, 96h flow-through (Pimephales promelas) LC50: = 32 mg/L, 96h static (Lepomis macrochirus) LC50: = 9.6 mg/L, 96h static (Poecilia reticulata)		(Pseudokirchneriella subcapitata) EC50: = 4.6 mg/L, 72h (Pseudokirchneriella subcapitata)

Component	Microtox	M-Factor
Ethylbenzene	EC50 = 9.68 mg/L 30 min EC50 = 96 mg/L 24 h	

12.2. Persistence and degradability

Persistence Insoluble in water, Persistence is unlikely, based on information available.

Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential May have some potential to bioaccumulate

Component	log Pow	Bioconcentration factor (BCF)
Ethylbenzene	3.6	15 dimensionless

12.4. Mobility in soil Spillage unlikely to penetrate soil The product is insoluble and floats on water The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

12.5. Results of PBT and vPvB assessment Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Endocrine disrupting properties

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be landfilled or incinerated, when in

compliance with local regulations. Do not let this chemical enter the environment. Do not empty into drains.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN1175
14.2. UN proper shipping name ETHYLBENZENE
14.3. Transport hazard class(es) 3
14.4. Packing group II

ADR

14.1. UN number UN1175
14.2. UN proper shipping name ETHYLBENZENE
14.3. Transport hazard class(es) 3
14.4. Packing group II

IATA

14.1. UN number UN1175
14.2. UN proper shipping name ETHYLBENZENE
14.3. Transport hazard class(es) 3
14.4. Packing group II

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
Ethylbenzene	100-41-4	202-849-4	-	-	X	X	KE-13532	X	X

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
Ethylbenzene	100-41-4	X	ACTIVE	X	-	X	X	X

Legend: X - Listed '-' - Not Listed **KECL** - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

Authorisation/Restrictions according to EU REACH Not applicable

Component	CAS No	REACH (1907/2006) -	REACH (1907/2006) -	REACH Regulation (EC

		Annex XIV - Substances Subject to Authorization	Annex XVII - Restrictions on Certain Dangerous Substances	1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Ethylbenzene	100-41-4	-	-	-

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Ethylbenzene	100-41-4	Not applicable	Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals
Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .
Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification See table for values

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
Ethylbenzene	WGK1	

Component	France - INRS (Tables of occupational diseases)
Ethylbenzene	Tableaux des maladies professionnelles (TMP) - RG 84

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
Ethylbenzene 100-41-4 (>95)	Prohibited and Restricted Substances	Group I	

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3
H225 - Highly flammable liquid and vapor

H304 - May be fatal if swallowed and enters airways
H332 - Harmful if inhaled
H373 - May cause damage to organs through prolonged or repeated exposure
H412 - Harmful to aquatic life with long lasting effects

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic
TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor
ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC - (Volatile Organic Compound)

Key literature references and sources for data
https://echa.europa.eu/information-on-chemicals
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.

Creation Date	06-Aug-2010
Revision Date	11-Oct-2023
Revision Summary	Not applicable.

This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended. .

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Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet

SAFETY DATA SHEET

Version 6.6
Revision Date 03/18/2023
Print Date 04/01/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Heptane

Product Number : 270512
Brand : Aldrich
Index-No. : 601-008-00-2
CAS-No. : 142-82-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Signal Word	Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_7H_{16}
Molecular weight	:	100.20 g/mol
CAS-No.	:	142-82-5
EC-No.	:	205-563-8
Index-No.	:	601-008-00-2

Component	Classification	Concentration
n-heptane		
	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1;	<= 100 %

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	Aquatic Acute 1; Aquatic Chronic 1; H225, H315, H336, H304, H400, H410 Concentration limits: 20 %: STOT SE 3, H336; M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Flash back possible over considerable distance.
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

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5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information

In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Store under inert gas.
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
n-heptane	142-82-5	TWA	85 ppm 350 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	440 ppm 1,800 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	500 ppm 2,000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	400 ppm 1,600 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	500 ppm 2,000 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	400 ppm	USA. ACGIH Threshold Limit Values (TLV)
		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 65 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

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data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 91 °C (196 °F) - lit.
f)	Initial boiling point and boiling range	98 °C 208 °F - lit. 98 °C (208 °F)
g)	Flash point	-4 °C (25 °F) - c.c.
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.1 %(V)
k)	Vapor pressure	48 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	No data available
m)	Density	0.684 g/mL at 25 °C (77 °F) - lit.
	Relative density	No data available

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n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: > 3 - Bioaccumulation is not expected.
p)	Autoignition temperature	223.0 °C (433.4 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	0.64 mm2/s at 20 °C (68 °F) -
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Vapors may form explosive mixture with air.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Risk of ignition or formation of inflammable gases or vapours with:
Strong oxidizing agents
phosphorus
in the presence of:
Chlorine

10.4 Conditions to avoid
Warming.

10.5 Incompatible materials
rubber, various plastics

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 5,000 mg/kg
(OECD Test Guideline 401)
Remarks: (in analogy to similar compounds)
The value is given in analogy to the following substances: isooctane
LC50 Inhalation - Rat - male and female - 4 h - > 29.29 mg/l - vapor

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(OECD Test Guideline 403)
LD50 Dermal - Rabbit - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)
Remarks: The value is given in analogy to the following substances: isooctane

Skin corrosion/irritation
Skin - Rabbit
Result: Irritating to skin. - 24 h
(OECD Test Guideline 404)
Remarks: The value is given in analogy to the following substances: isooctane
Remarks: Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)
Remarks: The value is given in analogy to the following substances: isooctane

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)
Remarks: **Germ cell mutagenicity**
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: rat hepatocytes
Method: OECD Test Guideline 473
Result: negative

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.
Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

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11.2 Additional Information

RTECS: MI7700000
Prolonged or repeated exposure to skin causes defatting and dermatitis., Central nervous system depression, narcosis, Damage to the lungs.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

No data available

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 10 d Result: 70 % - Readily biodegradable. Remarks: (ECHA)
Biochemical Oxygen Demand (BOD)	1,920 mg/g Remarks: (IUCLID)
Theoretical oxygen demand	3,500 mg/g Remarks: (Lit.)
Ratio BOD/ThBOD	55 % Remarks: (Lit.)

12.3 Bioaccumulative potential

Indication of bioaccumulation.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Additional ecological information	Do not empty into drains. Avoid release to the environment.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned

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containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1206 Class: 3 Packing group: II
Proper shipping name: Heptanes
Reportable Quantity (RQ):
Marine pollutant: yes Poison Inhalation Hazard: No

IMDG

UN number: 1206 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: HEPTANES
Marine pollutant : yes
Marine pollutant : yes

IATA

UN number: 1206 Class: 3 Packing group: II
Proper shipping name: Heptanes

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
n-heptane	142-82-5	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
n-heptane	142-82-5	1993-02-16

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any

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Version: 6.6 Revision Date: 03/18/2023 Print Date: 04/01/2023

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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: Hexachlorobutadiene**

· **Part number:** RHH-060
· **CAS Number:**
87-68-3
· **EC number:**
201-765-5
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 2 H310 Fatal in contact with skin.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.


GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Flam. Liq. 4 H227 Combustible liquid.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS06 GHS07 GHS08

· **Signal word** Danger

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Trade name: Hexachlorobutadiene

(Contd. of page 1)

· **Hazard-determining components of labeling:**
hexachlorobuta-1,3-diene
· **Hazard statements**
Combustible liquid.
Toxic if swallowed.
Fatal in contact with skin.
Causes skin irritation.
Suspected of causing cancer.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from flames and hot surfaces. – No smoking.
Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
Specific treatment (see on this label).
Rinse mouth.
If on skin: Wash with plenty of water.
IF exposed or concerned: Get medical advice/attention.
Take off immediately all contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 3
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 3
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**

· **PBT:**	
87-68-3	hexachlorobuta-1,3-diene

· **vPvB:**	
87-68-3	hexachlorobuta-1,3-diene

US

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Trade name: Hexachlorobutadiene

(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
87-68-3 hexachlorobuta-1,3-diene
· **Identification number(s)**
· **EC number:** 201-765-5

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
In case of irregular breathing or respiratory arrest provide artificial respiration.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

*
6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
1 ppm

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· **PAC-2:**
3 ppm

· **PAC-3:**
10 ppm

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7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Open and handle receptacle with care.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
87-68-3 hexachlorobuta-1,3-diene	
REL	Long-term value: 0.24 mg/m³, 0.02 ppm Skin; See Pocket Guide App. A
TLV	Long-term value: 0.21 mg/m³, 0.02 ppm Skin

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the skin.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

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· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:** Goggles recommended during refilling.

*
9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Not determined.
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-21 °C (-5.8 °F)
Boiling point/Boiling range:	215 °C (419 °F)
· **Flash point:**	≤93 °C (≤199.4 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Not determined.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	0.2 hPa (0.2 mm Hg)
· **Density at 20 °C (68 °F):**	1.665 g/cm³ (13.89443 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.5 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.

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· **Viscosity:**

Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 1,665.0 g/l / 13.90 lb/gal

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

*
11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)		
Oral	LD50	82 mg/kg (rat)
Dermal	LD50	100 mg/kg (rabbit)
Inhalative	LC50/4 h	370 mg/L (mouse)

87-68-3 hexachlorobuta-1,3-diene		
Oral	LD50	82 mg/kg (rat)
Dermal	LD50	100 mg/kg (rabbit)
Inhalative	LC50/4 h	370 mg/L (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
3

· **NTP (National Toxicology Program)**
Substance is not listed.

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· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**

· **PBT:**

87-68-3	hexachlorobuta-1,3-diene

· **vPvB:**

87-68-3	hexachlorobuta-1,3-diene

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

*
14 Transport information

· **UN-Number**
· **DOT, IMDG, IATA** UN2279

· **UN proper shipping name**
· **DOT** Hexachlorobutadiene
· **IMDG** HEXACHLOROBUTADIENE, MARINE POLLUTANT
· **IATA** HEXACHLOROBUTADIENE

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Hexachlorobutadiene

(Contd. of page 7)

· **Transport hazard class(es)**

· **DOT, IMDG**



· **Class**	6.1 Toxic substances
· **Label**	6.1

· **IATA**



· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	Yes (DOT) Symbol (fish and tree)
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	F-A,S-A
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	1 lbs, 0.454 kg
· **Remarks:**	Special marking with the symbol (fish and tree).
· **IMDG**	
· **Limited quantities (LQ)**	5 L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 2279 HEXACHLOROBUTADIENE, 6.1, III

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **TSCA new (21st Century Act): (Substances not listed)**
87-68-3 | hexachlorobuta-1,3-diene

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
C

· **TLV (Threshold Limit Value established by ACGIH)**
A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

Trade name: Hexachlorobutadiene

(Contd. of page 9)

NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 3: Acute toxicity – Category 3
Acute Tox. 2: Acute toxicity – Category 2
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Carc. 2: Carcinogenicity – Category 2
· *** Data compared to the previous version altered.**

1.Identification

Product name:	Hexane
Catalog#:	7548AF
IUPAC name:	hexane
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification

Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 3), Respiratory system

Pictogram:



Signal word:

Warning

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Precautionary statement(s):

P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a poison center or doctor if you feel unwell.
P321	Specific treatment (see supplemental first aid instructions on this label).
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	110-54-3
Purity:	98%
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.
Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.
Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.
Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.
Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.
Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Specific hazards arising from the chemical: Carbon oxides.
Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.
Environmental precautions: Do not let product enter drains, other waterways, or soil.
Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.
Conditions for safe storage, including any incompatibilities: Store in a tightly-closed

container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: Not available.
NIOSH REL: Not available.
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes: Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.

Hands: Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.

Skin and body: Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.

Respiratory: Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Pysical State:	Clear colorless liquid
Molecular Formula:	C6H14
Molecular Weight:	86.18
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	69 °C
Freezing/Melting Point:	Not available.
Flash Point:	-26.0 °C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Not available.
Relative Density:	Not available.
Refractive Index:	Not available.
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	Not available.
Acute toxicity:	Not available.
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	Not available.

13. Disposal Considerations

Disposal of waste:	Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.
Disposal of packaging:	Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT(United States)

UN number:	UN1208
Proper shipping name:	Hexanes(Hexane)
Transport hazard class:	3
Packing group:	II

IATA

UN Number:	not dangerous goods.
Proper shipping name:	Not available.
Transport hazard class:	Not available.
Packing group:	Not available.

15. Regulatory Information

TSCA Chemical Inventory:
This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not listed.	
NFPA Rating:	Health:	Not available.
	Flammability:	Not available.
	Instability:	Not available.

16. Additional Information

Revision Date: 02/25/2019
Printed Date: 3/28/2019

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall AK Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AK Scientific has been advised of the possibility of such damages.

SAFETY DATA SHEET

Version 5.6
Revision Date 12/11/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Indeno[1,2,3-*cd*]pyrene

Product Number : 48499
Brand : Supelco

CAS-No. : 193-39-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Warning

Hazard statement(s)
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{22}H_{12}$
Molecular weight	:	276.33 g/mol
CAS-No.	:	193-39-5
EC-No.	:	205-893-2

Hazardous components

Component	Classification	Concentration
Indeno[1,2,3-cd]pyrene		
	Carc. 2; H351	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Indeno[1,2,3-cd]pyrene	193-39-5	1-Hydroxypyrene (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the

sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	163.6 °C (326.5 °F)
f)	Initial boiling point and boiling range	536.0 °C (996.8 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Indeno[1,2,3-cd]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Indeno[1,2,3-cd]pyrene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Indeno[1,2,3-cd]pyrene	CAS-No. 193-39-5	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
H351	Suspected of causing cancer.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 12/11/2017 Print Date: 11/10/2018

ALADDIN SCIENTIFIC CORPORATION
14078 Meridian Parkway, Riverside, CA. 92518

SAFETY DATA SHEET

Version: v1
Revision Date: 2024-06-25
Print Date: 2024-06-26

SECTION 1:Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	: Iron
Product Number	: I433424
Brand	: aladdin
CAS-No.	: 7439-89-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	: Laboratory chemicals,Manufacture of substances.

1.3 Company

Company	: ALADDIN SCIENTIFIC CORPORATION
Address	: 14078 Meridian Parkway,
Riverside, CA. 92518	
Telephone	: +1 (833) 552-7181
Fax	: no data available

1.4 Emergency telephone number

CHEMTREC®, Inside the USA	: 1-800-424-9300
CHEMTREC®, Outside the USA	:

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Self-heating substances and mixtures Category 1

Combustible dust Yes

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H251 Self-heating; may catch fire

Precautionary statement(s)

ALADDIN SCIENTIFIC CORPORATION
14078 Meridian Parkway, Riverside, CA. 92518

P235	Keep cool.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P403	Store in a well-ventilated place.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	: Iron, FE005155
Formula	: Fe
Molecular weight	: 55.85
CAS No.	: 7439-89-6
EC-NO.	: 231-096-4

Component	Classification	Concentration
Iron		
	no data available	wire reel, 0.5m, diameter 0.5mm, hard, 99.99+%

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Show this material safety data sheet to the doctor in attendance.
If inhaled
Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention.
In case of skin contact
Wash off immediately with plenty of water for at least 15 minutes. Get medical attention.
In case of eye contact
RinseImmediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
If swallowed
Get medical attention if symptoms occur. Clean mouth with water and drink afterwards plenty of water.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

no data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water,Foam,Carbon dioxide (CO2),Dry powder
Unsuitable extinguishing media
no data available

5.2 Special hazards arising from the substance or mixture

no data available

5.3 Advice for firefighters

wear self-contained breathing and full protective gear.

5.4 Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Ensure adequate ventilation.

6.2 Environmental precautions

Should not be released into the environment. Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel into suitable containers for disposal. Do not let this chemical enter the environment. Avoid dust formation.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation.

7.2 Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place.

7.3 Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of Regulation (EU)2016/425 and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing.The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a fullface particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection,use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN(EU).

Control of environmental exposure

If safety requires, prevent further leakage or spillage. Do not let the product enter the sewer.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance	form: Powder Solid color: Grey
b) Odour	no data available
c) Odour Threshold	no data available
d) pH	no data available
e) Melting point/freezing point	no data available
f) Initial boiling point and boiling range	no data available
g) Flash point	no data available
h) Evaporation rate	no data available
i) Flammability (solid, gas)	no data available

j) Upper/lower flammability or explosive limits	no data available
k) Vapour pressure	no data available
l) Vapour density	no data available
m) Relative density	no data available
n) Water solubility	no data available
o) Partition coefficient: n-octanol/water	no data available
p) Auto-ignition temperature	no data available
q) Decomposition temperature	no data available
r) Viscosity	no data available
s) Explosive properties N	no data available
t) Oxidizing properties N	no data available

9.2 Other safety information

no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

Avoid dust formation. Excess heat. Exposure to moist air or water.

10.5 Incompatible materials

Strong oxidizing agents, Acids, Fluorine, halogenated agents, Halogens, oxygen, nitriles,Aldehydes

10.6 Hazardous decomposition products

Hydrogen

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
no data available
Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available
Respiratory or skin sensitisation
no data available
Germ cell mutagenicity
no data available
Carcinogenicity
no data available
Reproductive toxicity
no data available
Specific target organ toxicity - single exposure
no data available
Specific target organ toxicity - repeated exposure
no data available
Aspiration hazard
no data available
Additional Information
no data available

SECTION 12: Ecological information

12.1 Toxicity

no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

no data available

SECTION 13:

13.1 Disposal considerations

Product

ALADDIN SCIENTIFIC CORPORATION
14078 Meridian Parkway, Riverside, CA. 92518

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.
Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: UN3190	Packing group: no data available	Class: no data available
Proper shipping name: no data available	Reportable Quantity(RQ): no data available	Poison Inhalation Hazard: no data available
Environmental Hazards: no data available		

IMDG

UN number: UN3190	Packing group: no data available	EMS-No: no data available
Proper shipping name: no data available		

IATA

UN number: UN3190	Packing group: no data available	Class: no data available
Proper shipping name: no data available		

SECTION 15: Regulatory information

Please note that waste disposal should also meet local regulations. If applicable, the chemical meets the requirements of the Regulations on the Safety Management of Hazardous Chemicals (adopted by the State Council on December 4, 2013).

SECTION 16: Other information

Prepared By	Regulatory Affairs ALADDIN SCIENTIFIC CORPORATION Email: QualityAssurance@aladdinsci.com
Creation Date	27-Feb-2023
Revision Date	25-Jun-2024
Print Date	26-Jun-2024
Revision Summary	SDS sections updated v1

Disclaimer

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SAFETY DATA SHEET

Version 6.4
Revision Date 03/18/2023
Print Date 02/04/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Isopropyl alcohol

Product Number : W292907
Brand : Aldrich
Index-No. : 603-117-00-0
CAS-No. : 67-63-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

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Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Precautionary statement(s)

P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing mist or vapors.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

May form explosive peroxides.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	2-Propanol sec-Propyl alcohol Isopropyl alcohol Isopropanol
Formula	:	C_3H_8O
Molecular weight	:	60.10 g/mol
CAS-No.	:	67-63-0
EC-No.	:	200-661-7
Index-No.	:	603-117-00-0

Component	Classification	Concentration
2-Propanol		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319,	<= 100 %

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	H336 Concentration limits: >= 20 %: STOT SE 3, H336;	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

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5.4 Further information

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®).
Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Change contaminated clothing. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Handle and store under inert gas. hygroscopic

Storage class

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2-Propanol	67-63-0	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		
		STEL	400 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Not classifiable as a human carcinogen		
		ST	500 ppm 1,225 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	400 ppm 980 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	400 ppm 980 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	400 ppm 980 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	500 ppm 1,225 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
2-Propanol	67-63-0	Acetone	40 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Long-term systemic effects	500 mg/m3
Workers	Skin contact	Long-term systemic effects	888mg/kg BW/d
Consumers	Inhalation	Long-term systemic effects	89 mg/m3
Consumers	Skin contact	Long-term systemic effects	319mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	26mg/kg BW/d

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	28 mg/kg
Sea water	140.9 mg/l
Fresh water	140.9 mg/l
Sea sediment	552 mg/kg
Fresh water sediment	552 mg/kg

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8.2 Exposure controls

Appropriate engineering controls
Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Chloroprene
Minimum layer thickness: 0.65 mm
Break through time: 120 min
Material tested:KCL 720 Camapren®

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Color: colorless
b)	Odor	alcohol-like
c)	Odor Threshold	1 ppm
d)	pH	at 20 °C (68 °F)neutral
e)	Melting	Melting point/range: -89.5 °C (-129.1 °F) - lit.

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	point/freezing point	
f)	Initial boiling point and boiling range	82 °C 180 °F - lit.
g)	Flash point	12.0 °C (53.6 °F) - closed cup
h)	Evaporation rate	3.0
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13.4 %(V) Lower explosion limit: 2 %(V)
k)	Vapor pressure	43 hPa at 20 °C (68 °F)
l)	Vapor density	2.07
m)	Density	0.785 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	soluble
o)	Partition coefficient: n-octanol/water	log Pow: 0.05 - Bioaccumulation is not expected.
p)	Autoignition temperature	425.0 °C (797.0 °F)
q)	Decomposition temperature	Distillable in an undecomposed state at normal pressure.
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Minimum ignition energy	0.65 mJ
Conductivity	< 0.1 µS/cm
Surface tension	20.8 mN/m at 25.0 °C (77.0 °F)
Relative vapor density	2.07

SECTION 10: Stability and reactivity

10.1 Reactivity

Vapors may form explosive mixture with air.

10.2 Chemical stability

Reacts with air to form peroxides.
The product is chemically stable under standard ambient conditions (room temperature) .
Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.
Stable under recommended storage conditions.

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10.3 Possibility of hazardous reactions
Vapors may form explosive mixture with air.

10.4 Conditions to avoid
Warming.

10.5 Incompatible materials
rubber, various plastics, oils

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,840 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - 37.5 mg/l - vapor

(OECD Test Guideline 403)
LD50 Dermal - Rabbit - 12,800 mg/kg
Remarks: (RTECS)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation
(OECD Test Guideline 405)
Remarks: (Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitization
Buehler Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

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Test Type: In vivo micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
Inhalation, Oral - May cause drowsiness or dizziness. - Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: NT8050000
Central nervous system depression, prolonged or repeated exposure can cause:, Nausea, Headache, Vomiting, narcosis, Drowsiness, Overexposure may cause mild, reversible liver effects., Aspiration may lead to:, Lung edema, Pneumonia
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:

Headache
Dizziness
inebriation
Unconsciousness
narcosis

After uptake of large quantities:

Coma

Handle in accordance with good industrial hygiene and safety practice.

Kidney - Irregularities - Based on Human Evidence

Kidney - Irregularities - Based on Human Evidence

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SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 9,640 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 13,299 mg/l - 48 h Remarks: (IUCLID)
Toxicity to algae	IC50 - Desmodesmus subspicatus (green algae) - > 1,000 mg/l - 72 h Remarks: (IUCLID)
Toxicity to bacteria	EC5 - Pseudomonas putida - 1,050 mg/l - 16 h Remarks: (Lit.)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 5 d Result: 53 % - Readily biodegradable. (Directive 67/548/EEC, Annex V, C.6)
Theoretical oxygen demand	2,400 mg/g Remarks: (Lit.)
Ratio BOD/ThBOD	49 % Remarks: (IUCLID)

12.3 Bioaccumulative potential

No bioaccumulation is to be expected (log Pow <= 4).

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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SECTION 14: Transport information

DOT (US)

UN number: 1219 Class: 3 Packing group: II
Proper shipping name: Isopropanol
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG

UN number: 1219 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ISOPROPANOL

IATA

UN number: 1219 Class: 3 Packing group: II
Proper shipping name: Isopropanol

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
2-Propanol	67-63-0	2007-03-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2-Propanol	67-63-0	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2-Propanol	67-63-0	2007-03-01

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See

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www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.4 Revision Date: 03/18/2023 Print Date: 02/04/2024

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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 2 Reviewed on 03/24/2019

*
1 Identification

· **Product identifier**

· **Trade name: Isopropylbenzene**

· **Part number:** RAB-015
· **CAS Number:**
98-82-8
· **EC number:**
202-704-5
· **Index number:**
601-024-00-X
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07 GHS08

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Isopropylbenzene

(Contd. of page 1)

· **Signal word** Danger

· **Hazard-determining components of labeling:**
cumene
· **Hazard statements**
Flammable liquid and vapor.
Harmful if swallowed.
Suspected of causing cancer.
May cause respiratory irritation.
May be fatal if swallowed and enters airways.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
Rinse mouth.
Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Isopropylbenzene

(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
98-82-8 cumene
· **Identification number(s)**
· **EC number:** 202-704-5
· **Index number:** 601-024-00-X

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 4)

(Contd. of page 3)

· **Protective Action Criteria for Chemicals**

· **PAC-1:**
50 ppm
· **PAC-2:**
300 ppm
· **PAC-3:**
730 ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
98-82-8 cumene	
PEL	Long-term value: 245 mg/m³, 50 ppm Skin
REL	Long-term value: 245 mg/m³, 50 ppm Skin
TLV	Long-term value: (246) NIC-0.5 mg/m³, (50) NIC-0.1 ppm NIC-A3

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.

(Contd. on page 5)

(Contd. of page 4)

· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Unpleasant
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-96.9 °C (-142.4 °F)
Boiling point/Boiling range:	152 °C (305.6 °F)
· **Flash point:**	31 °C (87.8 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	420 °C (788 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

(Contd. on page 6)

(Contd. of page 5)

· **Explosion limits:**	
Lower:	0.8 Vol %
Upper:	6 Vol %
· **Vapor pressure at 20 °C (68 °F):**	3 hPa (2.3 mm Hg)
· **Density at 20 °C (68 °F):**	0.9 g/cm³ (7.5105 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.2 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 %
	900.0 g/l / 7.51 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	1,400 mg/kg (rat)
Dermal	LD50	>3,160 mg/kg (rabbit)
Inhalative	LC50/4 h	24.7 mg/L (mouse)

98-82-8 cumene		
Oral	LD50	1,400 mg/kg (rat)
Dermal	LD50	>3,160 mg/kg (rabbit)
Inhalative	LC50/4 h	24.7 mg/L (mouse)

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
2B

· **NTP (National Toxicology Program)**
R

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1918

· **UN proper shipping name**	
· **DOT**	Isopropylbenzene
· **IMDG, IATA**	ISOPROPYLBENZENE

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

· **Transport hazard class(es)**

· **DOT, IMDG, IATA**



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	30
· **EMS Number:**	3-07
· **Stowage Category**	A
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	5000 lbs, 2270 kg
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 1918 ISOPROPYLBENZENE, 3, III, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 8)

· **Proposition 65**

· **Chemicals known to cause cancer:**

Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

· **Chemicals known to cause developmental toxicity:**

Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

D, CBD

· **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Carc. 2: Carcinogenicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
Asp. Tox. 1: Aspiration hazard – Category 1
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 4.11
Revision Date 10/12/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Lead

Product Number : 391352
Brand : Aldrich

CAS-No. : 7439-92-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure (Category 2), H373
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Warning

Hazard statement(s)

H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Pb
Molecular weight	:	207.20 g/mol
CAS-No.	:	7439-92-1
EC-No.	:	231-100-4

Hazardous components

Component	Classification	Concentration
Lead		
	Acute Tox. 4; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H302, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	See 1910.1025		
Lead	7439-92-1	TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Confirmed animal carcinogen with unknown relevance to humans		
		TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Peripheral Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		See Appendix C		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Lead	200 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: powder

b) Odour — No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 327.4 °C (621.3 °F) - lit.
f)	Initial boiling point and boiling range	1,740 °C (3,164 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Lead oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity

Rat
Cytogenetic analysis

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Lead)
NTP:	RAHC - Reasonably anticipated to be a human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Lead)
OSHA:	OSHA specifically regulated carcinogen (Lead)

Reproductive toxicity

Reproductive toxicity - Rat - Inhalation
Effects on Newborn: Biochemical and metabolic.

Reproductive toxicity - Rat - Oral
Effects on Newborn: Behavioral.

Reproductive toxicity - Mouse - Oral
Effects on Fertility: Female fertility index (e.g., # females pregnant per females mated). Effects on Fertility: Pre-implantation mortality (e.g., reduction in numbe corpora lutea).

May damage fertility. May damage the unborn child.

Developmental Toxicity - Rat - Inhalation
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Developmental Toxicity - Rat - Oral
Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Developmental Toxicity - Rat - Oral
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Mouse - Oral
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OF7525000

anemia

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LOEC - Oncorhynchus mykiss (rainbow trout) - 1.19 mg/l - 96.0 h
	LC50 - Micropterus dolomieui - 2.2 mg/l - 96.0 h
	mortality NOEC - Salvelinus fontinalis - 1.7 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	mortality LOEC - Daphnia (water flea) - 0.17 mg/l - 24 h
	mortality NOEC - Daphnia (water flea) - 0.099 mg/l - 24 h
Toxicity to algae	mortality EC50 - Skeletonema costatum - 7.94 mg/l - 10 d

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus kisutch - 2 Weeks - 150 µg/l
	Bioconcentration factor (BCF): 12

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead)
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Lead	7439-92-1	2009-02-01

	CAS-No.	Revision Date
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Lead	7439-92-1	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.11 Revision Date: 10/12/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 6.7
Revision Date 15.04.2023
Print Date 03.06.2023
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	:	Lindane
Product Number	:	233390
Brand	:	Aldrich
Index-No.	:	602-043-00-6
REACH No.	:	A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No.	:	58-89-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 SPRUCE ST ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone

Emergency Phone #	:	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 4), H332
Acute toxicity, Dermal (Category 4), H312
Effects on or via lactation, H362
Specific target organ toxicity - repeated exposure (Category 2), H373

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Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal Word	Danger
Hazard statement(s)	
H301	Toxic if swallowed.
H312 + H332	Harmful in contact with skin or if inhaled.
H362	May cause harm to breast-fed children.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
P260	Do not breathe dust.
P263	Avoid contact during pregnancy and while nursing.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of water.Call a POISON CENTER/ doctor if you feel unwell.
Supplemental Hazard Statements	none

Reduced Labeling (<= 125 ml)

Pictogram



Signal Word	Danger
Hazard statement(s)	
H301	Toxic if swallowed.
H362	May cause harm to breast-fed children.
Precautionary statement(s)	
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
Supplemental Hazard Statements	none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1α,2α,3β,4α,5α,6β-Hexachlorocyclohexane
γ-BHC

Formula : $C_6H_6Cl_6$
Molecular weight : 290,83 g/mol
CAS-No. : 58-89-9
EC-No. : 200-401-2
Index-No. : 602-043-00-6

Component		Classification	Concentration
Gammaxene			
CAS-No. EC-No. Index-No.	58-89-9 200-401-2 602-043-00-6	Acute Tox. 3; Acute Tox. 4; Lact. ; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H301, H332, H312, H362, H373, H400, H410 M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Hydrogen chloride gas
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures

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Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
required when dusts are generated.

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Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Recommended Filter type: Filter type P3

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	solid
b)	Color	No data available
c)	Odor	No data available
d)	Melting point/freezing point	Melting point/range: 113 - 115 °C - lit.
e)	Initial boiling point and boiling range	323,4 °C at 1.013,25 hPa
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	No data available
i)	Autoignition temperature	No data available
j)	Decomposition temperature	No data available
k)	pH	No data available
l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	8,35 g/l at 25 °C
n)	Partition coefficient: n-octanol/water	Pow: 3,5 at 22 °C - Bioaccumulation is not expected.
o)	Vapor pressure	No data available
p)	Density	1,85 g/cm3
	Relative density	No data available
q)	Relative vapor density	No data available

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r)	Particle characteristics	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 88,0 mg/kg
Remarks: (IUCLID)
LC50 Inhalation - Rat - 4 h - 1.560 mg/m3 - dust/mist

Dermal: No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
Remarks: (IUCLID)

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Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
Studies indicating a hazard to babies during the lactation period

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

RTECS: GV4900000
Neurotoxic effects., Cyanosis, Headache, Nausea, Incoordination., Tremors, Vomiting, Dizziness, Seizures., Unconsciousness
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Reproductive system. - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	LC50 - Cyprinus carpio (Carp) - 0,2 mg/l - 96,0 h Remarks: (ECOTOX Database)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0,80 - 6,50 mg/l - 48 h Remarks: (ECOTOX Database)
	LOEC - Daphnia - 0,021 mg/l - 7 d Remarks: (ECOTOX Database)

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Toxicity to algae	EC50 - Algae - 4,00 mg/l - 72 h Remarks: (ECOTOX Database)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	Growth inhibition NOEC - Daphnia magna (Water flea) - 0,15 mg/l - 16 d Remarks: (ECOTOX Database)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
Bioaccumulation: Pimephales promelas (fathead minnow) - 304 d - 0,0091 mg/l(Gammaxene)

Bioconcentration factor (BCF): 674

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

14.1 UN number
ADR/RID: 2811 IMDG: 2811 IATA: 2811

14.2 UN proper shipping name
ADR/RID: TOXIC SOLID, ORGANIC, N.O.S. (Gammaxene)
IMDG: TOXIC SOLID, ORGANIC, N.O.S. (Gammaxene)

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IATA: Toxic solid, organic, n.o.s. (Gammaxene)

14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packaging group

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: yes IMDG Marine pollutant: yes IATA: no

14.6 Special precautions for user

Tunnel restriction code : (E)

Further information : No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorisations and/or restrictions on use

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Gammaxene

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. : ENVIRONMENTAL HAZARDS

Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H301	Toxic if swallowed.
H312	Harmful in contact with skin.
H312 + H332	Harmful in contact with skin or if inhaled.
H332	Harmful if inhaled.
H362	Toxic if swallowed.
H373	Harmful in contact with skin or if inhaled.
H400	May cause harm to breast-fed children.
H410	May cause damage to organs through prolonged or repeated exposure.

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Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Manganese

Product Number : 463728
Brand : Aldrich

CAS-No. : 7439-96-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H260 In contact with water releases flammable gases which may ignite spontaneously.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P223 Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232 Handle under inert gas. Protect from moisture.

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Mn
Molecular weight	:	54.94 g/mol
CAS-No.	:	7439-96-5
EC-No.	:	231-105-1

Hazardous components

Component	Classification	Concentration
Manganese		
	Water-react. 1; Aquatic Acute 3; Aquatic Chronic 3; H260, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Carbon dioxide (CO2)

Unsuitable extinguishing media
Water

5.2 Special hazards arising from the substance or mixture
Manganese/manganese oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Moisture sensitive. Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Manganese	7439-96-5	TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC)		
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		C	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		

		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) varies		
		TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	0.020000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		
		TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Impervious clothing, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,244 °C (2,271 °F) - lit.
f)	Initial boiling point and boiling range	1,962 °C (3,564 °F) - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	7.3 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
acids, Halogens, Bases, Phosphorus, Sulphur oxides, Peroxides

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Manganese/manganese oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 9,000 mg/kg(Manganese)
Inhalation: No data available(Manganese)
Dermal: No data available(Manganese)
No data available(Manganese)

Skin corrosion/irritation
Skin - Rabbit(Manganese)
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit(Manganese)
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
No data available(Manganese)

Germ cell mutagenicity

No data available(Manganese)

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Manganese)

May cause reproductive disorders.(Manganese)

Specific target organ toxicity - single exposure
No data available(Manganese)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Manganese)

Additional Information
RTECS: OO9275000

Men exposed to manganese dusts showed a decrease in fertility. Chronic man system. Early symptoms include languor, sleepiness and weakness in the le disturbances such as uncontrollable laughter and a spastic gait with tend cases. High incidence of pneumonia has been found in workers exposed to t(Manganese)

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence(Manganese)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 40 mg/l - 48 h(Manganese)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Manganese)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3208 Class: 4.3 Packing group: I
Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)
Poison Inhalation Hazard: No

IMDG
UN number: 3208 Class: 4.3 Packing group: I EMS-No: F-G, S-N
Proper shipping name: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S. (Manganese)

IATA
UN number: 3208 Class: 4.3 Packing group: I
Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

SARA 311/312 Hazards
Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H260	In contact with water releases flammable gases which may ignite spontaneously.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	2

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	2
Special hazard.I:	W

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling

or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 3.15
Revision Date 03/05/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mercury

Product Number : 215457
Brand : Sigma-Aldrich
Index-No. : 080-001-00-0

CAS-No. : 7439-97-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2), H330
Reproductive toxicity (Category 1B), H360
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Hg
Molecular weight	:	200.59 g/mol
CAS-No.	:	7439-97-6
EC-No.	:	231-106-7
Index-No.	:	080-001-00-0

Hazardous components

Component	Classification	Concentration
Mercury		
	Acute Tox. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H360, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. In some instances, a mercury spill kit may be used. Please consult with your site EHS representative to determine the most appropriate clean up method.Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Mercury	7439-97-6	C	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
	Remarks	Potential for dermal absorption		
		CEIL	1.0mg/10m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.05 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: silver, white

b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -38.87 °C (-37.97 °F) - lit.
f)	Initial boiling point and boiling range	356.6 °C (673.9 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	< 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)
l)	Vapour density	6.93 - (Air = 1.0)
m)	Relative density	13.55 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.00006 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	6.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Ammonia, Azides, Nitrates, Chlorates, Copper

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Mercury/mercury oxides.
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - male - 2 h - < 27 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Presumed human reproductive toxicant

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OV4550000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Cyprinus carpio (Carp) - 0.160 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Carassius auratus (goldfish) - 1,789 d - 0.25 µg/l

Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: A. W. Mercury
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

IATA
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: Mercury

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Mercury	CAS-No. 7439-97-6	Revision Date 2013-12-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.5
Revision Date 10/02/2021
Print Date 02/05/2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Methyl Isobutyl Ketone

Product Number : PHR1556
Brand : Sigma-Aldrich
Index-No. : 606-004-00-4
CAS-No. : 108-10-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C6H12O
Molecular weight	:	100.16 g/mol
CAS-No.	:	108-10-1
EC-No.	:	203-550-1
Index-No.	:	606-004-00-4

Component	Classification	Concentration

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4-methylpentan-2-one		
	Flam. Liq. 2; Acute Tox. 4; Eye Irrit. 2A; Carc. 2; STOT SE 3; H225, H332, H319, H351, H335 Concentration limits: 20 %: STOT SE 3, H335;	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

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5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store at Room Temperature.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
4-methylpentan-2-one	108-10-1	STEL	75 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans		
		TWA	50 ppm 205 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	75 ppm 300 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	100 ppm 410 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	20 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Confirmed animal carcinogen with unknown relevance to humans		
		TWA	50 ppm 205 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	75 ppm 300 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	50 ppm 205 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	75 ppm 300 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
4-methylpentan-2-one	108-10-1	methyl isobutyl ketone	1 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

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Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 240 min
Material tested:Butoject® (KCL 898)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Color: colorless
b)	Odor	characteristic
c)	Odor Threshold	0.1 ppm
d)	pH	at 20 °C (68 °F)neutral
e)	Melting point/freezing point	Melting point: -85 °C (-121 °F)
f)	Initial boiling point and boiling range	115.8 °C 240.4 °F at 1,013.25 hPa
g)	Flash point	14 °C (57 °F) - closed cup - DIN 51755 Part 1
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 8 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapor pressure	20 hPa at 20 °C (68 °F)
l)	Vapor density	3.46 - (Air = 1.0)

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m)	Density	0.80 g/cm3 at 20 °C (68 °F)
	Relative density	No data available
n)	Water solubility	14.1 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - completely soluble
o)	Partition coefficient: n-octanol/water	log Pow: 1.9 - Bioaccumulation is not expected.
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Surface tension	23.6 mN/m at 20 °C (68 °F)
Relative vapor density	3.46 - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.
Vapors may form explosive mixture with air.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Violent reactions possible with:
Strong oxidizing agents
Reducing agents
Bases

10.4 Conditions to avoid

May form peroxides on contact with air.
Warming.

10.5 Incompatible materials

rubber, various plastics, Copper

10.6 Hazardous decomposition products

In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,080 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male - 4 h - 11.6 mg/l
(OECD Test Guideline 403)
Dermal: No data available
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Causes serious eye irritation. - 72 h
(OECD Test Guideline 405)
(Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: rat hepatocytes
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

IARC:	2B - Group 2B: Possibly carcinogenic to humans (4-methylpentan-2-one)
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

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OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause respiratory irritation. - Respiratory system

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 90 d - NOAEL (No observed adverse effect level) - 250 mg/kg - LOAEL (Lowest observed adverse effect level) - 1,000 mg/kg
Remarks: Subchronic toxicity

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Blurred vision, Dermatitis
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Danio rerio (zebra fish) - > 179 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - > 200 mg/l - 48 h (OECD Test Guideline 202)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 83 % - Readily biodegradable. (OECD Test Guideline 301F)
Theoretical oxygen demand	2,720 mg/g Remarks: (Lit.)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

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12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1245 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHYL ISOBUTYL KETONE

IATA

UN number: 1245 Class: 3 Packing group: II
Proper shipping name: Methyl isobutyl ketone

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
4-methylpentan-2-one	108-10-1	2007-03-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

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SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.5 Revision Date: 10/02/2021 Print Date: 02/05/2022

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SAFETY DATA SHEET

Creation Date 27-Jan-2010 **Revision Date** 13-Aug-2024 **Revision Number** 9

1. Identification

Product Name **Methylene chloride**

Cat No. : **D37-1; D37-4; D37-20; D37-200; D37-200LC; D37-500; D37FB-19; D37FB-50; D37FB-115; D37FB-200; D37POP-19; D37POPB-50; D37POPB-200; D37RB-19; D37RB-50; D37RB-115; D37RB-200; D37RS-19; D37RS-28; D37RS-50; D37RS-115; D37RS-200; D37SK-4; D37SK-4LC; D37SS-28; D37SS-50; D37SS-115; D37SS-200; D37SS-1350; D37RS1000ASME; NC1485726; D37RE200ASME; NC1568702; NC1641358; XXMECLDOW2000; XXMECLDOW200LI; NC1870181; D37ETSS1350; XXD37ET200LI; NC1948847; D37SS-19; NC2047457; NC1561768; NC2373916; D37RS200ASME; D37RS1350ASME; NC2575075**

CAS No 75-09-2
Synonyms Dichloromethane; DCM

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.
After February 3, 2025, this chemical substance (as defined in TSCA section 3(2))/ product cannot be distributed in commerce to retailers. After January 28, 2026, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of methylene chloride equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant; (2) Processing for incorporation into a formulation, mixture, or reaction product; (3) Processing for repackaging; (4) Processing for recycling; (5) Industrial or commercial use as a laboratory chemical; (6) Industrial or commercial use as a bonding agent for solvent welding; (7) Industrial and commercial use as a paint and coating remover from safety critical, corrosion sensitive components of aircraft and spacecraft; (8) Industrial and commercial use as a processing aid; (9) Industrial and commercial use for plastic and rubber products manufacturing; (10) Industrial and commercial use as a solvent that becomes part of a formulation or mixture, where that formulation or mixture will be used inside a manufacturing process, and the solvent (methylene chloride) will be reclaimed; (11) Industrial and commercial use in the refinishing for wooden furniture, decorative pieces, and architectural fixtures of artistic, cultural or historic value until May 8, 2029; (12) Industrial and commercial use in adhesives and sealants in aircraft, space vehicle, and turbine applications for structural and safety critical non-structural applications until May 8, 2029; (13) Disposal; and (14) Export.

Details of the supplier of the safety data sheet

Company
Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Liver, Kidney, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Response
IF exposed or concerned: Get medical attention/advice
Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin

IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention

Storage

Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Other hazards

Contains a known or suspected endocrine disruptor.
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Methylene chloride	75-09-2	>99.5

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects . Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Causes central nervous system depression: Continued or high exposures by inhalation will cause anaesthetic effects. This may result in a loss of consciousness and could prove fatal: Causes formation of carbon monoxide in the blood. Carbon monoxide may cause adverse effects on the cardiovascular system and the central nervous system

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature 556 °C / 1032.8 °F

Explosion Limits

Upper	23 vol %
Lower	13 vol %
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2). Phosgene. Hydrogen chloride gas.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Ensure adequate ventilation.
Environmental Precautions Should not be released into the environment.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Vapors are heavier than air and may spread along floors. Handle product only in closed system or provide appropriate exhaust ventilation. Reacts with aluminum and its alloys.

Storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store in aluminum containers. Incompatible Materials. Strong oxidizing agents. Strong acids. Amines.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH	Mexico OEL (TWA)
Methylene chloride	TWA: 50 ppm	(Vacated) TWA: 500 ppm (Vacated) STEL: 2000 ppm (Vacated) Ceiling: 1000 ppm TWA: 25 ppm STEL: 125 ppm	IDLH: 2300 ppm	TWA: 50 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.
Respiratory Protection	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Recommended Filter type:	low boiling organic solvent. Type AX. Brown. conforming to EN371.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-97 °C / -142.6 °F
Boiling Point/Range	39 °C / 102.2 °F
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	23 vol %
Lower	13 vol %
Vapor Pressure	350 mbar @ 20°C
Vapor Density	2.93 (Air = 1.0)
Specific Gravity	1.33
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	556 °C / 1032.8 °F
Decomposition Temperature	No information available
Viscosity	0.42 mPas @ 25°C
Molecular Formula	C H2 Cl2
Molecular Weight	84.93

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions. Decomposes on exposure to light.
Conditions to Avoid	Excess heat. Protect from direct sunlight.
Incompatible Materials	Strong oxidizing agents, Strong acids, Amines
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO_2), Phosgene, Hydrogen chloride gas
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	Forms a detonable mixture with nitric acid.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methylene chloride	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rat)	53 mg/L (Rat) 6 h 76000 mg/m³ (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Methylene chloride	75-09-2	Group 2A	Reasonably Anticipated	A3	X	A3

IARC (International Agency for Research on Cancer)

IARC (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

Mexico - Occupational Exposure Limits - Carcinogens
A1 - Confirmed Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Confirmed Animal Carcinogen
A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects Mutagenic effects have occured in microorganisms.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Liver Kidney Blood

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Causes central nervous system depression: Continued or high exposures by inhalation will cause anaesthetic effects. This may result in a loss of consciousness and could prove fatal: Causes formation of carbon monoxide in the blood. Carbon monoxide may cause adverse effects on the cardiovascular system and the central nervous system

Endocrine Disruptor Information No information available

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Methylene chloride	EC50:>660 mg/L/96h	Pimephales promelas: LC50:193 mg/L/96h	EC50: 1 mg/L/24 h EC50: 2.88 mg/L/15 min	EC50: 140 mg/L/48h

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

Component	log Pow
Methylene chloride	1.25

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Methylene chloride - 75-09-2	U080	-

14. Transport information

DOT

UN-No UN1593
Proper Shipping Name DICHLOROMETHANE
Hazard Class 6.1
Packing Group III

TDG

UN-No UN1593
Proper Shipping Name DICHLOROMETHANE
Hazard Class 6.1
Packing Group III

IATA

UN-No UN1593
Proper Shipping Name Dichloromethane
Hazard Class 6.1
Packing Group III

IMDG/IMO

UN-No UN1593
Proper Shipping Name Dichloromethane
Hazard Class 6.1
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Methylene chloride	75-09-2	X	ACTIVE	R

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

Section 6(a) of the Toxic Substances Control Act (TSCA)
This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in

TSCA section 3(13)) for consumer paint or coating removal.
After February 3, 2025, this chemical substance (as defined in TSCA section 3(2))/ product cannot be distributed in commerce to retailers. After January 28, 2026, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of methylene chloride equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant; (2) Processing for incorporation into a formulation, mixture, or reaction product; (3) Processing for repackaging; (4) Processing for recycling; (5) Industrial or commercial use as a laboratory chemical; (6) Industrial or commercial use as a bonding agent for solvent welding; (7) Industrial and commercial use as a paint and coating remover from safety critical, corrosion sensitive components of aircraft and spacecraft; (8) Industrial and commercial use as a processing aid; (9) Industrial and commercial use for plastic and rubber products manufacturing; (10) Industrial and commercial use as a solvent that becomes part of a formulation or mixture, where that formulation or mixture will be used inside a manufacturing process, and the solvent (methylene chloride) will be reclaimed; (11) Industrial and commercial use in the refinishing for wooden furniture, decorative pieces, and architectural fixtures of artistic, cultural or historic value until May 8, 2029; (12) Industrial and commercial use in adhesives and sealants in aircraft, space vehicle, and turbine applications for structural and safety critical non-structural applications until May 8, 2029; (13) Disposal; and (14) Export.

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

Component	CAS No	**TSCA 12(b)** - Notices of Export
Methylene chloride	75-09-2	Section 6

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Methylene chloride	75-09-2	X	-	200-838-9	X	X	X	X	X	KE-23893

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Component	CAS No	Weight %	SARA 313 - Threshold Values %	SARA 313 - Reporting threasholds
Methylene chloride	75-09-2	>99.5	0.1 %	-

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Methylene chloride	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Methylene chloride	X		-

OSHA - Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Methylene chloride	125 ppm STEL 12.5 ppm Action Level	-

	25 ppm TWA	

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

Component	Hazardous Substances RQs	CERCLA Extremely Hazardous Substances RQs	SARA Reportable Quantity (RQ)
Methylene chloride	1000 lb	-	1000 lb 454 kg

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS No	California Prop. 65	Prop 65 NSRL	Category
Methylene chloride	75-09-2	Carcinogen	200 µg/day 50 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Methylene chloride	X	X	X	X	X

U.S. Department of Transportation
Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Methylene chloride	75-09-2	-	Use restricted. See entry 59. (see link for restriction details) Use restricted. See entry 75. (see link for restriction details)	-

REACH links
https://echa.europa.eu/substances-restricted-under-reach

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Methylene chloride	75-09-2	Listed	Not applicable	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Methylene chloride	75-09-2	Not applicable	Not applicable	Not applicable	Annex I - Y45

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 27-Jan-2010
Revision Date 13-Aug-2024
Print Date 13-Aug-2024
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

Version 6.5
Revision Date 02/07/2023
Print Date 01/13/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Naphthalene

Product Number : 184500
Brand : Aldrich
Index-No. : 601-052-00-2
CAS-No. : 91-20-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable solids (Category 2), H228
Acute toxicity, Oral (Category 4), H302
Carcinogenicity (Category 2), H351
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Warning

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Hazard statement(s)

H228	Flammable solid.
H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C10H8
Molecular weight	:	128.17 g/mol
CAS-No.	:	91-20-3
EC-No.	:	202-049-5
Index-No.	:	601-052-00-2

Component	Classification	Concentration
Naphthalene		
	Flam. Sol. 2; Acute Tox. 4; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H228, H302, H351, H400, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

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For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from heat and sources of ignition.

Storage class
Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Naphthalene	91-20-3	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		

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		TWA	10 ppm 50 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	15 ppm 75 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	10 ppm 50 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.1 ppm 0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Naphthalene	91-20-3	1-Naphthol + 2-Naphthol			ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

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Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when dusts are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: flakes, granules Color: white
b)	Odor	aromatic
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 80 - 82 °C (176 - 180 °F) - lit.
f)	Initial boiling point and boiling range	218 °C 424 °F - lit.
g)	Flash point	78.5 °C (173.3 °F) - closed cup - ISO 2719
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 2. - Flammability (solids)
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 5.9 %(V) Lower explosion limit: 0.9 %(V)
k)	Vapor pressure	0.072 hPa at 20 °C (68 °F) - OECD Test Guideline 104
l)	Vapor density	No data available
m)	Density	1.08 g/cm3 at 24.7 °C (76.5 °F) - OECD Test Guideline 109
	Relative density	No data available
n)	Water solubility	0.0308 g/l at 25 °C (77 °F) - OECD Test Guideline 105 - slightly soluble
o)	Partition coefficient: n-octanol/water	log Pow: 3.4 at 25 °C (77 °F) - OECD Test Guideline 107 - Bioaccumulation is not expected.
p)	Autoignition temperature	526 - 587 °C (979 - 1089 °F) at 1,013 hPa - DIN 51794
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

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9.2 Other safety information

Surface tension	31.8 mN/m at 100.0 °C (212.0 °F)

SECTION 10: Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Violent reactions possible with:
Oxidizing agents
chromium(VI) oxide
benzoyl chloride
aluminium chloride
Risk of explosion with:
nitrogen oxides

10.4 Conditions to avoid

Heat, flames and sparks.
Strong heating.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Mouse - female - 710 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - > 0.4 mg/l - vapor

(OECD Test Guideline 403)
LD50 Dermal - Rabbit - 20,000 mg/kg
Remarks: (RTECS)
No data available

Skin corrosion/irritation

Skin - Rabbit
Result: No skin irritation - 24 h
Remarks: (ECHA)

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Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation - 24 h
Remarks: (ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster ovary cells
Metabolic activation: Metabolic activation
Method: OECD Test Guideline 473
Result: positive
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: unscheduled DNA synthesis assay
Species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: US-EPA
Result: negative
Remarks: (ECHA)

Carcinogenicity
Suspected of causing cancer.

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Naphthalene)
	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. (Naphthalene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Naphthalene)
	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. (Naphthalene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

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Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 91 Days - NOAEL (No observed adverse effect level) - 200 mg/kg - LOAEL (Lowest observed adverse effect level) - 400 mg/kg

Repeated dose toxicity - Mouse - male and female - Oral - 90 Days - NOAEL (No observed adverse effect level) - 100 mg/kg

Repeated dose toxicity - Rat - male and female - Dermal - 90 Days - NOAEL (No observed adverse effect level) - 1,000 mg/kg

Repeated dose toxicity - Rat - male and female - inhalation (vapor) - 90 Days - NOAEL (No observed adverse effect level) - 300 mg/kg

RTECS: QJ0525000
Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer., Naphthalene is retinotoxic and systemic absorption of its vapors above 15ppm, may result in:, cataracts, optic neuritis, corneal injury, Eye irritation, Ingestion may provoke the following symptoms:, hemolytic anemia, hemoglobinuria, Nausea, Headache, Vomiting, Gastrointestinal disturbance, Convulsions, anemia, Kidney injury may occur., Seizures., Coma.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Heart -

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Oncorhynchus mykiss (rainbow trout) - 1.6 mg/l - 96 h (OECD Test Guideline 203)
	flow-through test LC50 - Pimephales promelas (fathead minnow) - 7.9 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 2.16 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata (green algae) - 2.96 mg/l - 4 h Remarks: (ECHA)
Toxicity to	flow-through test LC50 - Oncorhynchus kisutch (coho salmon) - 2.1

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fish(Chronic toxicity)	mg/l - 96 h Remarks: (ECHA)	

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 2 % - Not readily biodegradable. (OECD Test Guideline 302C)

12.3 Bioaccumulative potential

Bioaccumulation	Cyprinus carpio (Carp) - 56 d at 25 °C(Naphthalene) Bioconcentration factor (BCF): 36.5 - 168 (OECD Test Guideline 305) Remarks: Bioaccumulation is unlikely.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1334 Class: 4.1 Packing group: III
Proper shipping name: Naphthalene, refined
Reportable Quantity (RQ): 100 lbs
Marine pollutant: yes Poison Inhalation Hazard: No

IMDG

UN number: 1334 Class: 4.1 Packing group: III EMS-No: F-A, S-G
Proper shipping name: NAPHTHALENE, REFINED
Marine pollutant : yes

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IATA
UN number: 1334 Class: 4.1 Packing group: III
Proper shipping name: Naphthalene, refined

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Naphthalene	91-20-3	

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.5 Revision Date: 02/07/2023 Print Date: 01/13/2024

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SAFETY DATA SHEET

Revision Date 24-Dec-2021 **Revision Number** 4

1. Identification

Product Name **n-Butylbenzene**

Cat No. : **AC107850000; AC107850010; AC107850050; AC107850500; AC107852500**

CAS No 104-51-8
Synonyms 1-Phenylbutane

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3

Label Elements

Signal Word
Warning

Hazard Statements
Flammable liquid and vapor



Precautionary Statements
Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store in a well-ventilated place. Keep cool
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Butyl benzene	104-51-8	> 99

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention.

Inhalation Remove from exposure, lie down. Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion Do NOT induce vomiting. Clean mouth with water. Aspiration hazard. Get medical attention.

Most important symptoms and effects Difficulty in breathing. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Water mist may be used to cool closed containers. Chemical foam.

Unsuitable Extinguishing Media No information available

Flash Point	59 °C / 138.2 °F
Method -	No information available
Autoignition Temperature	412 °C / 773.6 °F

Explosion Limits

Upper	5.80%
Lower	.80%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Combustible material. Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
0	2	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment as required.
Environmental Precautions	See Section 12 for additional Ecological Information.
Methods for Containment and Clean Up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Avoid contact with skin and eyes. Do not breathe dust. Do not breathe mist/vapors/spray. Use spark-proof tools and explosion-proof equipment. Use only non-sparking tools.
Storage.	Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat, sparks and flame. Incompatible Materials. Strong oxidizing agents. oxygen.

8. Exposure controls / personal protection

Exposure Guidelines	This product does not contain any hazardous materials with occupational exposure limitsestablished by the region specific regulatory bodies.
Engineering Measures	Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.
Respiratory Protection	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard

EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-88 °C / -126.4 °F
Boiling Point/Range	183 °C / 361.4 °F @ 760 mmHg
Flash Point	59 °C / 138.2 °F
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	5.80%
Lower	.80%
Vapor Pressure	1.33 hPa @ 23 °C
Vapor Density	4.6
Specific Gravity	0.860
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	412 °C / 773.6 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C10 H14
Molecular Weight	134.22

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Incompatible products.

Incompatible Materials Strong oxidizing agents, oxygen

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Butyl benzene	104-51-8	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Butyl benzene	Group III Chemical	Not applicable	Not applicable

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity
Do not empty into drains.

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility .

Component	log Pow
Butyl benzene	4.6

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT
UN-No UN2709
Hazard Class 3
Packing Group III

TDG
UN-No UN2709
Hazard Class 3
Packing Group III

IATA
UN-No UN2709
Proper Shipping Name BUTYLBENZENES
Hazard Class 3

Packing Group III

IMDG/IMO

UN-No UN2709
Proper Shipping Name BUTYLBENZENES
Hazard Class 3
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Butyl benzene	104-51-8	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Butyl benzene	104-51-8	X	-	203-209-7	X	X	X	X	X	-

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Butyl benzene	X	X	X	-	-

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland This product does not contain any DHS chemicals.

Security

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Butyl benzene	104-51-8	Not applicable	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Butyl benzene	104-51-8	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date 24-Dec-2021
Print Date 24-Dec-2021
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

Creation Date 14-Sep-2009 **Revision Date** 28-Dec-2021 **Revision Number** 5

1. Identification

Product Name **N-HEPTANE**

Cat No. : **AC610361000**

CAS No 142-82-5
Synonyms Normal heptane.; Heptane

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	
Aspiration Toxicity	Category 1

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
May cause drowsiness or dizziness
May be fatal if swallowed and enters airways
Causes skin irritation
Causes serious eye irritation
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements
Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Take precautionary measures against static discharge
Keep cool
Response
Get medical attention/advice if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
If skin irritation occurs: Get medical advice/attention
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects

3. Composition/Information on Ingredients

Component	CAS No	Weight %

n-Heptane	142-82-5	>95

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention.

Inhalation Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention. Risk of serious damage to the lungs (by aspiration). If not breathing, give artificial respiration.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.

Most important symptoms and effects Difficulty in breathing. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO_2, dry chemical, dry sand, alcohol-resistant foam. Water mist may be used to cool closed containers.

Unsuitable Extinguishing Media Water may be ineffective

Flash Point -4 °C / 24.8 °F

Method - No information available

Autoignition Temperature 215 °C / 419 °F

Explosion Limits

Upper 6.7 vol %

Lower 1.05 vol %

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products

Carbon monoxide (CO). Carbon dioxide (CO_2).

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
3	3	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment and Clean Up Remove all sources of ignition. Soak up with inert absorbent material. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Do not breathe mist/vapors/spray. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. Wash hands before breaks and immediately after handling the product. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Flammables area. Incompatible Materials. Strong oxidizing agents.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
n-Heptane	TWA: 400 ppm STEL: 500 ppm	(Vacated) TWA: 400 ppm (Vacated) TWA: 1600 mg/m³ (Vacated) STEL: 500 ppm (Vacated) STEL: 2000 mg/m³ TWA: 500 ppm TWA: 2000 mg/m³	IDLH: 750 ppm TWA: 85 ppm TWA: 350 mg/m³ Ceiling: 440 ppm Ceiling: 1800 mg/m³	TWA: 400 ppm STEL: 500 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures None under normal use conditions.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Petroleum distillates
Odor Threshold	No information available

pH	No information available
Melting Point/Range	-91 °C / -131.8 °F
Boiling Point/Range	98 °C / 208.4 °F
Flash Point	-4 °C / 24.8 °F
Evaporation Rate	2.8 (Butyl Acetate = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	6.7 vol %
Lower	1.05 vol %
Vapor Pressure	48 mbar @ 20 °C
Vapor Density	3.5
Specific Gravity	0.683
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	215 °C / 419 °F
Decomposition Temperature	No information available
Viscosity	0.4 mPa s at 20 °C
Molecular Formula	C7 H16
Molecular Weight	100.20

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Heat, flames and sparks. Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
n-Heptane	>2000 mg/kg (rat)	LD50 = 3000 mg/kg (Rabbit)	LC50 > 73.5 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
n-Heptane	142-82-5	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)
STOT - repeated exposure Kidney Liver Blood

Aspiration hazard Aspiration hazard

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
n-Heptane	Not listed	LC50: = 375.0 mg/L, 96h (Cichlid fish)	Not listed	EC50: >10 mg/L/24h

Persistence and Degradability Persistence is unlikely

Bioaccumulation/ Accumulation No information available.

Mobility The product is insoluble and floats on water. Is not likely mobile in the environment due its low water solubility.

Component	log Pow
n-Heptane	4.66

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1206
Proper Shipping Name HEPTANES
Hazard Class 3
Packing Group II

TDG

UN-No UN1206
Proper Shipping Name HEPTANES
Hazard Class 3
Packing Group II

IATA

UN-No UN1206
Proper Shipping Name Heptanes
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No UN1206

Proper Shipping Name	Heptanes
Hazard Class	3
Packing Group	II

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
n-Heptane	142-82-5	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
n-Heptane	142-82-5	X	-	205-563-8	X	X	X	X	X	KE-18271

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
n-Heptane	X	X	X	-	X

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade Serious risk, Grade 3

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
n-Heptane	-	Use restricted. See item 75. (see link for restriction details)	-

https://echa.europa.eu/substances-restricted-under-reach

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
n-Heptane	142-82-5	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
n-Heptane	142-82-5	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 14-Sep-2009
Revision Date 28-Dec-2021
Print Date 28-Dec-2021
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
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End of SDS

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 01/29/2019

1 Identification

· **Product identifier**

· **Trade name: n-Hexane**

· **Part number:** RNA-018
· **CAS Number:**
110-54-3
· **EC number:**
203-777-6
· **Index number:**
601-037-00-0
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Repr. 2 H361 Suspected of damaging fertility or the unborn child.
STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.
Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 3 Reviewed on 01/29/2019

Trade name: n-Hexane

(Contd. of page 1)

· **Hazard pictograms**



GHS02 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
n-hexane

· **Hazard statements**
Highly flammable liquid and vapor.
Causes skin irritation.
Suspected of damaging fertility or the unborn child.
May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.

· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
Specific treatment (see on this label).
Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
Get medical advice/attention if you feel unwell.
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

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Printing date 03/25/2019 Version Number 3 Reviewed on 01/29/2019

Trade name: n-Hexane

(Contd. of page 2)

· **HMIS-ratings (scale 0 - 4)**



Health = 1
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
110-54-3 n-hexane
· **Identification number(s)**
· **EC number:** 203-777-6
· **Index number:** 601-037-00-0

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
During heating or in case of fire poisonous gases are produced.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

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6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
260 ppm

· **PAC-2:**
2900* ppm

· **PAC-3:**
8600** ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

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· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
110-54-3 n-hexane	
PEL	Long-term value: 1800 mg/m³, 500 ppm
REL	Long-term value: 180 mg/m³, 50 ppm
TLV	Long-term value: 176 mg/m³, 50 ppm Skin; BEI

· **Ingredients with biological limit values:**	
110-54-3 n-hexane	
BEI	0.4 mg/L Medium: urine Time: end of shift at end of workweek Parameter: 2.5-Hexanedione without hydrolysis

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the skin.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

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· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-95 °C (-139 °F)
Boiling point/Boiling range:	69 °C (156.2 °F)
· **Flash point:**	-22 °C (-7.6 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	240 °C (464 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	1.2 Vol %
Upper:	7.4 Vol %
· **Vapor pressure at 20 °C (68 °F):**	110 hPa (82.5 mm Hg)
· **Density at 20 °C (68 °F):**	0.7 g/cm³ (5.8415 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.1 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 700.0 g/l / 5.84 lb/gal

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· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	5,000 mg/kg (rat)
Dermal	LD50	3,000 mg/kg (rabbit)

110-54-3 n-hexane		
Oral	LD50	5,000 mg/kg (rat)
Dermal	LD50	3,000 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **NTP (National Toxicology Program)**
Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.

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· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1208
· **UN proper shipping name**	
· **DOT**	Hexanes
· **IMDG, IATA**	HEXANES
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	
· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-07
· **Stowage Category**	E
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

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· **Transport/Additional information:**

· **DOT**

· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	5000 lbs, 2270 kg

· **IMDG**

· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1208 HEXANES, 3, II, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
II

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 2
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Repr. 2: Reproductive toxicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2
Asp. Tox. 1: Aspiration hazard – Category 1
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.10
Revision Date 09/06/2024
Print Date 09/07/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Nickel

Product Number : 203904
Brand : Aldrich
Index-No. : 028-002-01-4
CAS-No. : 7440-02-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Skin sensitization (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Lungs, H372

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Short-term (acute) aquatic hazard (Category 3), H402
Long-term (chronic) aquatic hazard (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard Statements

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs (Lungs) through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing must not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	Ni
Molecular weight	:	58.69 g/mol
CAS-No.	:	7440-02-0
EC-No.	:	231-111-4
Index-No.	:	028-002-01-4

Component	Classification	Concentration
nickel powder; [particle diameter < 1 mm]		
	Skin Sens. 1; Carc. 2;	<= 100 %

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	STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; H317, H351, H372, H402, H412	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Nickel/nickel oxides
Not combustible.
Ambient fire may liberate hazardous vapours.

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5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Keep in a dry place. Handle and store under inert gas.

Storage class
Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

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7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
nickel powder; [particle diameter < 1 mm]	7440-02-0	TWA	1.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not suspected as a human carcinogen		
		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.015 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
nickel powder; [particle diameter < 1 mm]	7440-02-0	Nickel	5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Nickel	30 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

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Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter type P3
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Color: gray
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point: 1,455 °C (2,651 °F)
f)	Initial boiling point and boiling range	2,730 °C 4,946 °F

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g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 2.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	1 hPa at 1,810 °C (3,290 °F)
l)	Vapor density	No data available
m)	Density	8.9 g/mL at 25 °C (77 °F)
	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
acids, Oxidizing agents, Sulfur compounds, Hydrogen gas, Oxygen, Methanol, organic solvents, Aluminum, Fluorine, Ammonia

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 9,000 mg/kg
(OECD Test Guideline 401)
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available
Test Type: gene mutation test
Test system: Chinese hamster fibroblasts
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Micronucleus test
Test system: Chinese hamster fibroblasts
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

Carcinogenicity
Suspected of causing cancer.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

1 - Group 1: Carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

IARC: 2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

1 - Group 1: Carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle

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diameter < 1 mm])

NTP: RAHC - Reasonably anticipated to be a human carcinogen (nickel powder; [particle diameter < 1 mm])

RAHC - Reasonably anticipated to be a human carcinogen (nickel powder; [particle diameter < 1 mm])

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Inhalation - Causes damage to organs through prolonged or repeated exposure.
- Lungs

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 728 d - NOAEL (No observed adverse effect level) - 2.2 mg/kg - LOAEL (Lowest observed adverse effect level) - 6.7 mg/kg

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - 15.3 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	static test LC50 - Ceriodaphnia dubia (water flea) - 0.074 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata (green algae) - > 81.5 - 148 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to daphnia	semi-static test EC10 - Ceriodaphnia dubia (water flea) - > 2.8 - 53.6

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and other aquatic invertebrates(Chronic toxicity)	µg/l	- 7 d (US-EPA)

12.2 Persistence and degradability
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powders, flammable, n.o.s.
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3089 Class: 4.1 Packing group: II EMS-No: F-G, S-G
Proper shipping name: METAL POWDER, FLAMMABLE, N.O.S. (nickel powder; [particle diameter < 1 mm])
Marine pollutant : yes

IATA
UN number: 3089 Class: 4.1 Packing group: II

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Proper shipping name: Metal powder, flammable, n.o.s.

SECTION 15: Regulatory information

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

nickel powder; [particle diameter < 1 mm]	7440-02-0	>= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

nickel powder; [particle diameter < 1 mm]	7440-02-0	>= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

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nickel powder; [particle diameter < 1 mm] 7440-02-0

Maine Chemicals of High Concern

nickel powder; [particle diameter < 1 mm] 7440-02-0

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including nickel powder; [particle diameter < 1 mm], which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16: Other information

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.10 Revision Date: 09/06/2024 Print Date: 09/07/2024

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SAFETY DATA SHEET

Creation Date 26-Sep-2009 **Revision Date** 29-Mar-2024 **Revision Number** 3

1. Identification

Product Name **n-Propylbenzene**

Cat No. : **B21468**

CAS No 103-65-1
Synonyms 1-Phenyl Propane.

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757

Emergency Telephone Number
For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No. **US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	
Aspiration Toxicity	Category 1

Label Elements

Signal Word
Danger

Hazard Statements
Flammable liquid and vapor
May be fatal if swallowed and enters airways
May cause respiratory irritation



Precautionary Statements
Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Keep cool
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Toxic to aquatic life with long lasting effects

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Propyl benzene	103-65-1	>95

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention. Risk of serious damage to the lungs (by aspiration).

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting

occurs naturally, have victim lean forward.

Most important symptoms and effects Difficulty in breathing. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Water mist may be used to cool closed containers. Chemical foam. Water mist may be used to cool closed containers.

Unsuitable Extinguishing Media No information available

Flash Point 47 °C / 116.6 °F

Method - No information available

Autoignition Temperature 450 °C / 842 °F

Explosion Limits

Upper	6.00%
Lower	.80%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
3	2	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Ensure adequate ventilation. Wear personal protective equipment/face protection. Avoid contact with skin and eyes. Do not breathe mist/vapors/spray. Use spark-proof tools and explosion-proof equipment. Use only non-sparking tools. Wash hands before breaks and immediately after handling the product. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges.

Storage. Keep away from heat, sparks and flame. Flammables area. Keep container tightly closed in a dry and well-ventilated place. Incompatible Materials. Strong oxidizing agents.

8. Exposure controls / personal protection

Exposure Guidelines This product does not contain any hazardous materials with occupational exposure limitsestablished by the region specific regulatory bodies.

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting equipment.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Light yellow
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-99 °C / -146.2 °F
Boiling Point/Range	158 °C / 316.4 °F @ 760 mmHg
Flash Point	47 °C / 116.6 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	6.00%
Lower	.80%
Vapor Pressure	No information available
Vapor Density	4.1
Specific Gravity	0.860
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	450 °C / 842 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C9 H12
Molecular Weight	120.19

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability No information available.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Propyl benzene	LD50 = 6040 mg/kg (Rat)	Not listed	LC50 = 65000 ppm (Rat) 2 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation May cause irritation of respiratory tract

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Propyl benzene	103-65-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard Category 1

Symptoms / effects,both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Persistence and Degradability Persistence is unlikely

Bioaccumulation/ Accumulation No information available.

Mobility Is not likely mobile in the environment due its low water solubility.

Component	log Pow
Propyl benzene	3.68

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN2364
Proper Shipping Name N-PROPYL BENZENE
Hazard Class 3
Packing Group III

TDG

UN-No UN2364
Proper Shipping Name N-PROPYL BENZENE
Hazard Class 3
Packing Group III

IATA

UN-No UN2364
Proper Shipping Name n-PROPYLBENZENE
Hazard Class 3
Packing Group III

IMDG/IMO

UN-No UN2364
Proper Shipping Name PROPYLBENZENE
Hazard Class 3
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Propyl benzene	103-65-1	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Propyl benzene	103-65-1	X	-	203-132-9	X	X	X	X	X	KE-29781

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Propyl benzene	X	X	X	-	-

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH Not applicable

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Propyl benzene	103-65-1	-	-	-

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Propyl benzene	103-65-1	Listed	Not applicable	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Propyl benzene	103-65-1	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By
Health, Safety and Environmental Department
Email: chem.techinfo@thermofisher.com
www.thermofisher.com

Creation Date 26-Sep-2009
Revision Date 29-Mar-2024
Print Date 29-Mar-2024
Revision Summary New emergency telephone response service provider.

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

Safety Data Sheet
acc. to OSHA HCS

Date of issue: 05/07/2025 Revision date 05/07/2025

*
1 Identification

· **Product identifier**

· **Trade name: Perfluorooctanesulfonic Acid**
· **Synonym**
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonic acid; Heptadecafluorooctanesulfonic Acid; Perfluorooctane sulfonate;Perfluorooctylsulfonic Acid;
· **Other means of identification**

· **Article number:** 37233
· **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA

· **Information department:** Product safety department
· **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

*
2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flammable liquids 2	H225 Highly flammable liquid and vapor.


GHS08 Health hazard

Carcinogenicity 2	H351 Suspected of causing cancer.
Reproductive toxicity 1B	H360 May damage fertility or the unborn child.
Specific target organ toxicity (repeated exposure) 1	H372 Causes damage to organs through prolonged or repeated exposure.


GHS07

Eye irritation 2A	H319 Causes serious eye irritation.

(Contd. on page 2)

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Trade name: Perfluorooctanesulfonic Acid

(Contd. from page 1)

· **Label elements**
· **GHS label elements**
The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
perfluorooctane sulfonic acid
· **Hazard statements**
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
· **Precautionary statements**

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground / bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharge.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use CO2, powder or water spray to extinguish.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Information pertaining to particular dangers for man and environment:**
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

(Contd. on page 3)

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Trade name: Perfluorooctanesulfonic Acid

(Contd. from page 2)

· **HMIS-ratings (scale 0 - 4)**

HEALTH *2	Health = *2
FIRE 3	Fire = 3
REACTIVITY 0	Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Classification according to (d)(1)(ii) of § 1910.1200**
The SDS issuer does not object to the classifications provided by importers or manufacturers of precursor products.
· **Hazards not otherwise classified**
There are no adverse physical or health effects known that are not covered by the hazard classes of the Hazard Communications Standard.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
CAS: 64-17-5 RTECS: KQ6300000	ethanol	99.0%
CAS: 1763-23-1	perfluorooctane sulfonic acid	1.0%

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Special hazards arising from the substance or mixture**
67-56-1During heating or in case of fire poisonous gases are produced.

(Contd. on page 4)

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Trade name: Perfluorooctanesulfonic Acid

(Contd. from page 3)

· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**		
64-17-5	ethanol	1,800 ppm

· **PAC-2:**		
64-17-5	ethanol	3300* ppm

· **PAC-3:**		
64-17-5	ethanol	15000* ppm

· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:** Store in accordance with information listed on the product insert.
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

Date of issue: 05/07/2025 Revision date 05/07/2025

Trade name: Perfluorooctanesulfonic Acid

(Contd. from page 4)

*
8 Exposure controls/personal protection

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

64-17-5 ethanol	
PEL	Long-term value: 1900 mg/m³, 1000 ppm
REL	Long-term value: 1900 mg/m³, 1000 ppm
TLV	Short-term value: 1880 mg/m³, 1000 ppm A3

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Appropriate engineering controls** No further data; see section 7.
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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Safety Data Sheet
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Trade name: Perfluorooctanesulfonic Acid

(Contd. from page 5)

· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Physical state**	Liquid
· **Color:**	According to product specification
· **Odor:**	Alcohol-like
· **Structural Formula**	C8HF17O3S
· **Molecular Weight**	500.1 g/mol
· **Storage Buffer**	
· **Odor threshold:**	Not determined.
· **Formulation**	A solution in ethanol
· **Melting point/Melting range:**	-114 °C (-173.2 °F)
· **Boiling point/Boiling range:**	78 °C (172.4 °F)
· **Flammability:**	Highly flammable.
· **Explosion limits:**	
· **Lower:**	3.3 Vol %
· **Upper:**	19 Vol %
· **Flash point:**	13 °C (55.4 °F)
· **Auto igniting:**	425 °C (797 °F)
· **Decomposition temperature:**	Not determined.
· **pH-value:**	Not determined.
· **Viscosity:**	
· **Kinematic:**	Not determined.
· **SOLUBILITY**	
· **Dynamic at 20 °C (68 °F):**	1.2 mPas
· **Solubility in / Miscibility with**	
· **Water at 20 °C (68 °F):**	1,000 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	59 hPa (44.3 mm Hg)
· **Vapor pressure at 50 °C (122 °F):**	280 hPa (210 mm Hg)
· **Density at 20 °C (68 °F):**	0.79 g/cm³ (6.59255 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Particle characteristics**	Not applicable.

· **Other information**	
· **Appearance:**	
· **Form:**	Liquid
· **Important information on protection of health and environment, and on safety.**	
· **Ignition temperature:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

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Trade name: Perfluorooctanesulfonic Acid

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· **Solvent content:**	
· **Organic solvents:**	99.0 %
· **VOC content:**	99.00 % 990.0 g/l / 8.26 lb/gal
· **Solids content:**	0.0 %
· **Change in condition**	
· **Evaporation rate**	Not determined.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

*
11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	50,000 mg/kg
Inhalative	LC50/4 h	150 mg/l

64-17-5 ethanol		
Oral	LD50	10,470 mg/kg (rat) OECD Test Guideline 401
Inhalative	LC50/4 h	117–125 mg/l (rat) OECD 403 (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant
· **Interactive effects** No interactive effects between components are known.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
64-17-5	ethanol	1
1763-23-1	perfluorooctane sulfonic acid	2B

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

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· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Alternative sources for toxicological information**
No non-standard sources for toxicological information where used.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects**
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1993
· **UN proper shipping name**	
· **DOT**	Flammable liquids, n.o.s. (Ethanol)
· **IMDG**	FLAMMABLE LIQUID, N.O.S. (ETHANOL (ETHYL ALCOHOL))
· **IATA**	Flammable liquid, n.o.s. (ETHANOL)

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Trade name: Perfluorooctanesulfonic Acid

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· **Transport hazard class(es)**

· **DOT**



· **Class**	3 Flammable liquids
· **Label**	3

· **IMDG, IATA**



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **IATA**	
· **Remarks:**	When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.
· **Special precautions for user**	Warning: Flammable liquids
· **Hazard identification number (Kemler code):**	33
· **EMS Number:**	F-E,S-E
· **Stowage Category**	B
· **UN "Model Regulation":**	UN 1993 FLAMMABLE LIQUID, N.O.S. (ETHANOL (ETHYL ALCOHOL)), 3, II

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

1763-23-1	perfluorooctane sulfonic acid

· **TSCA (Toxic Substances Control Act):**
All components have the value ACTIVE.

· **Hazardous Air Pollutants**
None of the ingredients is listed.

· **Chemicals known to cause cancer:**

1763-23-1	perfluorooctane sulfonic acid

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
All ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value)**

64-17-5	ethanol	A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

· **Department issuing SDS:** Environment protection department.
· **Contact:** -
· **Date of previous version** 01/20/2023
· **Date of preparation** 05/07/2025
· **Abbreviations and acronyms:**
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation

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IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flammable liquids 2: Flammable liquids – Category 2
Eye irritation 2A: Serious eye damage/eye irritation – Category 2A
Carcinogenicity 2: Carcinogenicity – Category 2
Reproductive toxicity 1B: Reproductive toxicity – Category 1B
Specific target organ toxicity (repeated exposure) 1: Specific target organ toxicity (repeated exposure) – Category 1

· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.21
Revision Date 05/20/2025
Print Date 05/21/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Perfluorooctanoic acid

Product Number : 171468
Brand : Aldrich
Index-No. : 607-704-00-2
CAS-No. : 335-67-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

Acute toxicity : Category 4

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(Inhalation)

Skin corrosion	:	Sub-category 1C
Serious eye damage	:	Category 1
Carcinogenicity	:	Category 2
Reproductive toxicity	:	Category 1B
Effects on or via lactation		
Specific target organ toxicity - repeated exposure	:	Category 1 (Liver)

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H302 + H332 Harmful if swallowed or if inhaled.
H314 Causes severe skin burns and eye damage.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H362 May cause harm to breast-fed children.
H372 Causes damage to organs (Liver) through prolonged or repeated exposure.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P263 Avoid contact during pregnancy and while nursing.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.

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P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
pentadecafluorooctanoic acid	335-67-1*	>= 80 - <= 100	TSC

* Indicates that the identifier is a CAS No.
TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : First aiders need to protect themselves.
Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Immediately call in physician.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

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In case of eye contact	:	After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.
If swallowed	:	After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.
Most important symptoms and effects, both acute and delayed	:	The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11
Protection of first-aiders	:	For personal protection see section 8.
Notes to physician	:	No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water Foam Carbon dioxide (CO2) Dry powder
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Combustible. Development of hazardous combustion gases or vapours possible in the event of fire.
Hazardous combustion products	:	Carbon oxides Hydrogen fluoride
Specific extinguishing methods	:	No data available
Further information	:	Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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Special protective equipment for fire-fighters	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	:	Do not let product enter drains.
Methods and materials for containment and cleaning up	:	Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on safe handling	:	Work under hood. Do not inhale substance/mixture.
Further information on storage conditions	:	Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.
Storage class	:	6.1C, Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects
Recommended storage temperature	:	Recommended storage temperature see product label.
Packaging material	:	Suitable material: Amber Glass Bottle/Jar

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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P3

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	KCL 741 Dermatril® L

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	KCL 741 Dermatril® L

Remarks : This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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Tightly fitting safety goggles

Skin and body protection	:	Acid-resistant protective clothing
Hygiene measures	:	Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	flakes
Color	:	colourless
Odor	:	stinging
Odor Threshold	:	No data available
pH	:	2.6 (68 °F / 20 °C) Concentration: 1 g/l
Melting point/ range	:	131 - 133 °F / 55 - 56 °C Method: lit.
Boiling point/boiling range	:	372 °F / 189 °C (981 hPa) Method: lit.
Flash point	:	No data available
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Flammability (liquids)	:	No data available
Burning rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	0.69 hPa (77 °F / 25 °C)
Relative vapour density	:	No data available
Relative density	:	No data available

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Density	:	1.8 g/cm3 (68 °F / 20 °C)
Solubility(ies)		
Water solubility	:	3.4 g/l (68 °F / 20 °C)
Partition coefficient: n-octanol/water	:	log Pow: 6.30 Method: (calculated) Potential bioaccumulation (Lit.)
Autoignition temperature	:	No data available
Decomposition temperature	:	> 572 °F / > 300 °C
Viscosity		
Viscosity, dynamic	:	5.72 mPa.s (140 °F / 60 °C)
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	Not classified as explosive.
Oxidizing properties	:	none
Molecular weight	:	414.07 g/mol
Particle characteristics		
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Violent reactions possible with: Strong oxidizing agents Strong acids Bases
Conditions to avoid	:	no information available
Incompatible materials	:	No data available
Hazardous decomposition	:	In the event of fire: see section 5

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SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 500.1 mg/kg
(Expert judgement)
Acute toxicity estimate Inhalation - 4 h - 11.1 mg/l - vapour

(Expert judgement)
Dermal: No data available

Skin corrosion/irritation
Remarks: Severe skin irritation

Serious eye damage/eye irritation
Remarks: Causes serious eye damage.

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Suspected of causing cancer.

IARC:	1 - Group 1: Carcinogenic to humans (pentadecafluorooctanoic acid)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
May damage the unborn child.
Studies indicating a hazard to babies during the lactation period

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.
- Liver

Aspiration hazard
No data available

11.2 Additional Information

RTECS: RH0781000
Cough, Shortness of breath, Headache, Nausea, Vomiting
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:

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gastric pain
Nausea
Vomiting
Drowsiness
somnolence

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

pentadecafluorooctanoic acid:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae/aquatic plants	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: No data available

Persistence and degradability

Components:

pentadecafluorooctanoic acid:

Biodegradability	:	Remarks: No data available

Bioaccumulative potential

Components:

pentadecafluorooctanoic acid:

Bioaccumulation	:	Remarks: No data available
Partition coefficient: n-octanol/water	:	log Pow: 6.30 Method: (calculated) Remarks: Potential bioaccumulation

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(Lit.)

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

pentadecafluorooctanoic acid:

Additional ecological information	:	Discharge into the environment must be avoided.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3261
Proper shipping name	:	Corrosive solid, acidic, organic, n.o.s. (pentadecafluorooctanoic acid)
Class	:	8
Packing group	:	III
Labels	:	Class 8 - Corrosive substances
Packing instruction (cargo aircraft)	:	864
Packing instruction (passenger aircraft)	:	860

IMDG-Code

UN number	:	UN 3261
Proper shipping name	:	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (pentadecafluorooctanoic acid)

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Class	:	8
Packing group	:	III
Labels	:	8
EmS Code	:	F-A, S-B
Marine pollutant	:	no

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR Road

UN/ID/NA number	:	UN 3261
Proper shipping name	:	Corrosive solid, acidic, organic, n.o.s. (pentadecafluorooctanoic acid)
Class	:	8
Packing group	:	III
Labels	:	Class 8 - Corrosive substances
ERG Code	:	154
Marine pollutant	:	no
Poison Inhalation Hazard	:	No

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
pentadecafluorooctanoic acid	335-67-1	1	1

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

pentadecafluorooctanoic acid	335-67-1	>= 90 - <= 100 %

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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

pentadecafluorooctanoic acid	335-67-1

Washington Chemicals of High Concern

pentadecafluorooctanoic acid	335-67-1

California Prop. 65

WARNING: This product can expose you to chemicals including pentadecafluorooctanoic acid, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

International Regulations

Rotterdam Convention (Prior Informed Consent)	:	pentadecafluorooctanoic acid
Stockholm Convention (Persistent Organic Pollutants)	:	pentadecafluorooctanoic acid

The components of this product are reported in the following inventories:

TSCA	:	All substances listed as active on the TSCA inventory

TSCA list

The following substance(s) is/are subject to a Significant New Use Rule:

pentadecafluorooctanoic acid	335-67-1	See 40 CFR § 721.10536; Proposed Rule

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The following substance(s) is/are subject to TSCA 12(b) export notification requirements:
pentadecafluorooctanoic acid 335-67-1

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Revision Date : 05/20/2025

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SAFETY DATA SHEET

Version 8.6
Revision Date 03/20/2023
Print Date 01/07/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Phenol

Product Number : W322340
Brand : Aldrich
Index-No. : 604-001-00-2
CAS-No. : 108-95-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Germ cell mutagenicity (Category 2), H341
Specific target organ toxicity - repeated exposure (Category 2), Nervous system, Kidney, Liver, Skin, H373
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

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2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard statement(s)

H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H314	Causes severe skin burns and eye damage.
H341	Suspected of causing genetic defects.
H373	May cause damage to organs (Nervous system, Kidney, Liver, Skin) through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Hydroxybenzene
Formula	:	C_6H_6O
Molecular weight	:	94.11 g/mol
CAS-No.	:	108-95-2
EC-No.	:	203-632-7

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Index-No. : 604-001-00-2

Component	Classification	Concentration
Phenol		
	Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Muta. 2; STOT RE 2; Aquatic Acute 2; Aquatic Chronic 2; H301, H331, H311, H314, H318, H341, H373, H401, H411 Concentration limits: >= 3 %: Skin Corr. 1B, H314; 1 - < 3 %: Skin Irrit. 2, H315; 1 - < 3 %: Eye Irrit. 2, H319;	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
After contact with skin: rinse out with polyethylene glycol 400 or a mixture of polyethylene glycol 300/ethanol 2:1 and wash with plenty of water. If neither is available wash with plenty of water. Immediately take off contaminated clothing. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

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Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Handle and store under inert gas. Light sensitive.

Storage class
Storage class (TRGS 510): 6.1A: Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Phenol	108-95-2	TWA	5 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	5 ppm 19 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		C	15.6 ppm 60 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	5 ppm 19 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	5 ppm 19 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Phenol	108-95-2	Phenol	250mg/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

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8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Body Protection

Flame retardant antistatic protective clothing.

Respiratory protection

required when dusts/vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure

Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	stinging
c)	Odor Threshold	0.005 ppm
d)	pH	ca.5 at 50 g/l at 20 °C (68 °F)

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e)	Melting point/freezing point	Melting point/range: 38 - 43 °C (100 - 109 °F)
f)	Initial boiling point and boiling range	181.8 °C 359.2 °F at 1,013 hPa
g)	Flash point	81 °C (178 °F) at ca.1,013 hPa - closed cup - DIN 51758
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	0.53 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	3.2 at 20 °C(68 °F) - (Air = 1.0)
m)	Density	1.13 g/cm3 at 25 °C (77 °F) - DIN 51757
	Relative density	No data available
n)	Water solubility	87 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 1.47 at 30 °C (86 °F) - (ECHA), Bioaccumulation is not expected.
p)	Autoignition temperature	715 °C (1319 °F) at 1,013 hPa
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information

Surface tension	38.2 mN/m at 50.0 °C (122.0 °F)
Relative vapor density	3.2 at 20 °C (68 °F) - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Exothermic reaction with:

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Aluminum
Aldehydes
halogens
hydrogen peroxide
iron(III) compounds
Oxidizing agents
Strong acids
Strong bases
formaldehyde
Risk of explosion with:
nitrites
nitrates
salts of oxyhalogenic acids
peroxi compounds

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
rubber, various plastics, various alloys, various metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 100.1 mg/kg
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Acute toxicity estimate Inhalation - 4 h - 0.51 mg/l - dust/mist

(Expert judgment)
Symptoms: Irritation, Lung edema
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
LD50 Dermal - Rat - female - 660 mg/kg
(OECD Test Guideline 402)
No data available

Skin corrosion/irritation
Skin - In vitro study
Result: Causes burns.
(OECD Test Guideline 431)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Corrosive
(OECD Test Guideline 405)
Remarks: Causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
Sensitisation test: - Guinea pig

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Result: negative
Remarks: (IUCLID)

Germ cell mutagenicity
Suspected of causing genetic defects.
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster ovary cells
Metabolic activation: Metabolic activation
Method: OECD Test Guideline 473
Result: positive
Test Type: Mutagenicity (mammal cell test): micronucleus.
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: positive

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- Nervous system, Kidney, Liver, Skin
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 Additional Information

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Circulatory collapse, tachypnea, paralysis, Convulsions, Coma., necrosis of mouth and G.I. Tract, Jaundice, respiratory failure, cardiac arrest
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Onchorhynchus clarki - 8.9 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Ceriodaphnia dubia (water flea) - 3.1 mg/l - 48 h (US-EPA)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata (algae) - 61.1 mg/l - 96 h (US-EPA)
Toxicity to bacteria	static test IC50 - microorganisms - 21 mg/l - 24 h Remarks: (ECHA)
Toxicity to fish(Chronic toxicity)	semi-static test NOEC - Fish - 0.077 mg/l - 60 d Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - Daphnia magna (Water flea) - 0.16 mg/l - 16 d Remarks: (ECHA)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 100 h Result: 62 % - Readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation	Danio rerio (zebra fish) - 5 h at 25 °C - 2 mg/l(Phenol) Bioconcentration factor (BCF): 17.5 (OECD Test Guideline 305) Remarks: Does not bioaccumulate.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1671 Class: 6.1 Packing group: II
Proper shipping name: Phenol, solid
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1671 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: PHENOL, SOLID
Marine pollutant : yes

IATA

UN number: 1671 Class: 6.1 Packing group: II
Proper shipping name: Phenol, solid

SECTION 15: Regulatory information

SARA 302 Components

	CAS-No.	Revision Date
Phenol	108-95-2	2007-07-01

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Phenol	108-95-2	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Phenol	108-95-2	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Phenol	108-95-2	2007-07-01

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SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 8.6 Revision Date: 03/20/2023 Print Date: 01/07/2024

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Safety Data Sheet
acc. to OSHA HCS

Printing date 09/20/2016 *Reviewed on 09/20/2016*

1 Identification

· **Product identifier**

· **Product Name: p-Isopropyltoluene**

· **Part Number:** S-2320
· **Application of the substance / the mixture** Certified Reference Material

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
SPEX CertiPrep, LLC.
203 Norcross Ave, Metuchen,
NJ 08840 USA

· **Information department:** product safety department
· **Emergency telephone number:**
Emergency Phone Number (24 hours)
CHEMTREC (800-424-9300)
Outside US: 703-527-3887

2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Tox. 3 H331 Toxic if inhaled.



GHS08 Health hazard

STOT SE 1 H370 Causes damage to organs.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS06 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
methanol
· **Hazard statements**
H225 Highly flammable liquid and vapor.
H331 Toxic if inhaled.
H370 Causes damage to organs.
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dust/fume/gas/mist/vapors/spray.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 3
Fire = 3
Reactivity = 0

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Product Name: p-Isopropyltoluene

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· **HMIS-ratings (scale 0 - 4)**



*Health = *3*
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
67-56-1	methanol	99.9%

· **Chemical identification of the substance/preparation**		
99-87-6	Cymol	0.1%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
· **After inhalation:**
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Do not induce vomiting; immediately call for medical help.
· **Information for Doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** CO2, sand, extinguishing powder. Do not use water.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.

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Safety Data Sheet
acc. to OSHA HCS

Product Name: p-Isopropyltoluene

(Contd. of page 2)

See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
67-56-1 methanol	
PEL	Long-term value: 260 mg/m³, 200 ppm
REL	Short-term value: 325 mg/m³, 250 ppm Long-term value: 260 mg/m³, 200 ppm Skin
TLV	Short-term value: 328 mg/m³, 250 ppm Long-term value: 262 mg/m³, 200 ppm Skin; BEI

· **Ingredients with biological limit values:**	
67-56-1 methanol	
BEI	15 mg/L Medium: urine Time: end of shift Parameter: Methanol (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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Product Name: p-Isopropyltoluene

(Contd. of page 3)

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	According to product specification
· **Odor:**	Characteristic
· **Odour Threshold:**	Not applicable.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	64 °C (147 °F)
· **Flash point:**	11 °C (52 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	455 °C (851 °F)
· **Decomposition temperature:**	Not applicable.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	5.5 Vol %
Upper:	44.0 Vol %
· **Vapor pressure at 20 °C (68 °F):**	128 hPa (96 mm Hg)
· **Density at 20 °C (68 °F)**	0.79007 g/cm³ (6.593 lbs/gal)
· **Relative density**	Not applicable.
· **Vapor density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not applicable.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	100.0 %
VOC content:	100.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.

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acc. to OSHA HCS

Product Name: p-Isopropyltoluene

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· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· LD/LC50 values that are relevant for classification:		
67-56-1 methanol		
Oral	LD50	5628 mg/kg (rat)
Dermal	LD50	15800 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Toxic

· **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)
None of the ingredients is listed.

· NTP (National Toxicology Program)
None of the ingredients is listed.

· OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· UN-Number	
· DOT, ADR, IMDG, IATA	UN1230
· UN proper shipping name	
· DOT	Methanol
· ADR	1230 Methanol
· IMDG, IATA	METHANOL

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acc. to OSHA HCS

Printing date 09/20/2016 *Reviewed on 09/20/2016*

Product Name: p-Isopropyltoluene

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· **Transport hazard class(es)**

· **DOT**



· **Class**	3 Flammable liquids
· **Label**	3, 6.1

· **ADR**



· **Class**	3 Flammable liquids
· **Label**	3+6.1

· **IMDG**



· **Class**	3 Flammable liquids
· **Label**	3/6.1

· **IATA**



· **Class**	3 Flammable liquids
· **Label**	3 (6.1)
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	336
· **EMS Number:**	F-E,S-D
· **Stowage Category**	B
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1230 METHANOL, 3 (6.1), II

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Safety Data Sheet
acc. to OSHA HCS

Product Name: p-Isopropyltoluene

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

67-56-1	methanol

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

67-56-1	methanol

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **Protective Action Criteria for Chemicals**

· **PAC-1:**

67-56-1	methanol	530 ppm
99-87-6	Cymol	120 mg/m3

· **PAC-2:**

67-56-1	methanol	2,100 ppm
99-87-6	Cymol	1,300 mg/m3

· **PAC-3:**

67-56-1	methanol	7200* ppm
99-87-6	Cymol	1,900 mg/m3

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS06 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
methanol
· **Hazard statements**
H225 Highly flammable liquid and vapor.
H331 Toxic if inhaled.
H370 Causes damage to organs.
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dust/fume/gas/mist/vapors/spray.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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Safety Data Sheet
acc. to OSHA HCS

Product Name: p-Isopropyltoluene

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· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** product safety department
· **Contact:**
SPEX CertiPrep, LLC.
1-732-549-7144
· **Date of preparation / last revision** 09/20/2016 / -
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 3: Acute toxicity – Category 3
STOT SE 1: Specific target organ toxicity (single exposure) – Category 1

SAFETY DATA SHEET

Version 6.0
Revision Date 10/24/2019
Print Date 02/15/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Propylene

Product Number : 295663
Brand : Aldrich
Index-No. : 601-011-00-9
CAS-No. : 115-07-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Simple Asphyxiant,

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

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Hazard statement(s)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Propene
Formula	:	C_3H_6
Molecular weight	:	42.08 g/mol
CAS-No.	:	115-07-1
EC-No.	:	204-062-1
Index-No.	:	601-011-00-9

Component	Classification	Concentration
Propene		
	Flam. Gas 1; Press. Gas Liquefied gas; SA ; H220, H280,	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

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If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Clean up promptly by sweeping or vacuum.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Contents under pressure.

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Storage class (TRGS 510): 2A: Gases

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 60 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387)

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respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: gaseous, liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -185 °C (-301 °F) - lit.
f)	Initial boiling point and boiling range	-47.7 °C -53.9 °F - lit.
g)	Flash point	-108 °C (-162 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 11.1 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	15,604 hPa at 37.7 °C (99.9 °F)
l)	Vapour density	1.45 - (Air = 1.0)
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	1.45 - (Air = 1.0)

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SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

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Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: UC6740000

Dizziness, Headache, Central nervous system depression
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 1077 Class: 2.1
Proper shipping name: Propylene

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Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 1077 Class: 2.1 EMS-No: F-D, S-U
Proper shipping name: PROPYLENE

IATA
UN number: 1077 Class: 2.1
Proper shipping name: Propylene
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Propene	115-07-1	

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Propene	115-07-1	

Pennsylvania Right To Know Components

Propene	CAS-No. 115-07-1	Revision Date

New Jersey Right To Know Components

Propene	CAS-No. 115-07-1	Revision Date

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to

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appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.0 Revision Date: 10/24/2019 Print Date: 02/15/2023

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SAFETY DATA SHEET

Revision Date 24-Dec-2021 **Revision Number** 4

1. Identification

Product Name **sec-Butylbenzene**

Cat No. : **AC107860000; AC107860050; AC107860500; AC107862500**

CAS No 135-98-8
Synonyms 2-Phenylbutane

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2

Label Elements

Signal Word
Warning

Hazard Statements
Flammable liquid and vapor
Causes skin irritation
Causes serious eye irritation



Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Skin
If skin irritation occurs: Get medical advice/attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store in a well-ventilated place. Keep cool
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS No	Weight %
sec-Butylbenzene	135-98-8	> 99

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention.

Inhalation Remove from exposure, lie down. Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion Clean mouth with water. Get medical attention.

Most important symptoms and effects Difficulty in breathing. . Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Water mist may be used to cool closed containers. Chemical foam. Water mist may be used to cool closed containers.

Unsuitable Extinguishing Media No information available

Flash Point 45 °C / 113 °F

Method - No information available

Autoignition Temperature 415 °C / 779 °F

Explosion Limits

Upper	6.90%
Lower	0.80%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	2	0	N/A

6. Accidental release measures

Personal Precautions Remove all sources of ignition. Take precautionary measures against static discharges.
Environmental Precautions See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Avoid contact with skin and eyes. Do not breathe mist/vapors/spray. Take precautionary measures against static discharges. Use spark-proof tools and explosion-proof equipment. Use only non-sparking tools. Keep away from open flames, hot surfaces and sources of ignition.

Storage. Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat, sparks and flame. Flammables area. Keep container tightly closed in a dry and well-ventilated place. Incompatible Materials. Strong oxidizing agents.

8. Exposure controls / personal protection

Exposure Guidelines This product does not contain any hazardous materials with occupational exposure limitsestablished by the region specific regulatory bodies.

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting equipment.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-75 °C / -103 °F
Boiling Point/Range	173 - 174 °C / 343.4 - 345.2 °F @ 760 mmHg
Flash Point	45 °C / 113 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	6.90%
Lower	0.80%
Vapor Pressure	1.33 hPa @ 19 °C
Vapor Density	4.62
Specific Gravity	0.860
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	415 °C / 779 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C10 H14
Molecular Weight	134.22

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization No information available.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
sec-Butylbenzene	LD50 = 2240 µL/kg (Rat)	Not listed	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
sec-Butylbenzene	135-98-8	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity
Do not empty into drains.

Persistence and Degradability Insoluble in water May persist based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility.

Component	log Pow
sec-Butylbenzene	4.24

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN2709
Hazard Class 3

Packing Group III

TDG

UN-No UN2709
Hazard Class 3
Packing Group III

IATA

UN-No UN2709
Proper Shipping Name BUTYLBENZENES
Hazard Class 3
Packing Group III

IMDG/IMO

UN-No UN2709
Proper Shipping Name BUTYLBENZENES
Hazard Class 3
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
sec-Butylbenzene	135-98-8	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
sec-Butylbenzene	135-98-8	X	-	205-227-0	X	X	X	X	X	KE-04204

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
sec-Butylbenzene	X	-	X	-	-

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
sec-Butylbenzene	135-98-8	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
sec-Butylbenzene	135-98-8	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date 24-Dec-2021
Print Date 24-Dec-2021
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

Version 6.15
Revision Date 05/06/2025
Print Date 05/07/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Selenium

Product Number : 229865
Brand : Aldrich
Index-No. : 034-001-00-2
CAS-No. : 7782-49-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 3

Acute toxicity : Category 3

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(Inhalation)

Specific target organ toxicity - repeated exposure	:	Category 2
Long-term (chronic) aquatic hazard	:	Category 4

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H301 + H331 Toxic if swallowed or if inhaled.
H373 May cause damage to organs through prolonged or repeated exposure.
H413 May cause long lasting harmful effects to aquatic life.

Precautionary Statements :

Prevention:

P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response:

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
P314 Get medical advice/ attention if you feel unwell.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Selenium	7782-49-2*	>= 90 - <= 100	-

* Indicates that the identifier is a CAS No.
Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : First aiders need to protect themselves.
Show this material safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Immediately call in physician.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist.
Remove contact lenses.

If swallowed : If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

Most important symptoms and effects, both acute and delayed : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Protection of first-aiders : For personal protection see section 8.

Notes to physician : No data available

SECTION 5. FIRE-FIGHTING MEASURES

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Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Not combustible. Ambient fire may liberate hazardous vapours.
Hazardous combustion products	:	Selenium/selenium oxides
Specific extinguishing methods	:	No data available
Further information	:	Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	:	Do not let product enter drains.
Methods and materials for containment and cleaning up	:	Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10).

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Take up carefully. Dispose of properly. Clean up affected area.
Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on safe handling	:	Work under hood. Do not inhale substance/mixture.
Further information on storage conditions	:	Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Storage class	:	6.1C, Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects
Recommended storage temperature	:	Recommended storage temperature see product label.
Further information on storage stability	:	Store under inert gas.
Packaging material	:	Suitable material: LDPE Bottle/Jar

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Selenium	7782-49-2	TWA	0.2 mg/m3 (selenium)	OSHA Z-1
		TWA	0.2 mg/m3 (selenium)	ACGIH
		TWA	0.2 mg/m3 (selenium)	NIOSH REL

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN

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EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P3

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	KCL 741 Dermatril® L

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	KCL 741 Dermatril® L

Remarks : This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Safety glasses

Skin and body protection : protective clothing

Hygiene measures : Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : powder

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Color	:	light gray
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point/ range	:	423 °F / 217 °C Method: lit.
Boiling point/boiling range	:	1264.8 °F / 684.9 °C Method: lit.
Flash point	:	Not applicable
Evaporation rate	:	No data available
Burning rate	:	No data available
Self-ignition	:	428 - 482 °F / 220 - 250 °C 1,013.25 hPa Method: Relative self-ignition temperature for solids
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	> 0.001 hPa (68 °F / 20 °C)
Relative vapor density	:	No data available
Relative density	:	4.8 (77 °F / 25 °C)
Density	:	4.81 g/cm3 (77 °F / 25 °C) Method: lit.
Solubility(ies) Water solubility	:	0.1 g/l insoluble (69.6 °F / 20.9 °C) pH: 6 GLP: yes
Partition coefficient: n-octanol/water	:	log Pow: 5 Not applicable for inorganic substances
Autoignition temperature	:	No data available

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Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	Not classified as explosive.
Oxidizing properties	:	none
Molecular weight	:	78.96 g/mol
Particle characteristics Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No data available
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Risk of explosion with: alkali amides Metals Oxygen amides cadmium Potassium sodium nitrogen oxides Tin nitrogen trichloride Risk of ignition or formation of inflammable gases or vapours with: carbides peroxi compounds halogen-halogen compounds halogen oxides Fluorine lithium silicide barium peroxide Uranium Generates dangerous gases or fumes in contact with: hydrochloric acid sulfuric acid Exothermic reaction with:

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powdered aluminium
Beryllium
bromates
chromium(VI) oxide
chlorates
Nickel
Oxidizing agents
phosphorus
platinum
Nitric acid
silver oxide
Zinc
Alkali metals

Conditions to avoid	:	no information available
Incompatible materials	:	No data available
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - Expert judgment - 100.1 mg/kg
Symptoms: Gastrointestinal disturbance
Acute toxicity estimate Inhalation - Expert judgment - 4 h - 0.51 mg/l - dust/mist

Dermal: No data available
No data available

Skin corrosion/irritation
Skin - reconstructed human epidermis (RhE)
Result: No skin irritation
(OECD Test Guideline 431)

Serious eye damage/eye irritation
Eyes - Bovine cornea
Result: No eye irritation - 4 h
(OECD Test Guideline 437)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

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Test Type: Chromosome aberration test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal

Result: negative
Remarks: (ECHA)

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 13 Weeks - NOAEL (No observed adverse effect level) - 0.4 mg/kg
Remarks: (in analogy to similar products)
The value is given in analogy to the following substances: Sodium selenite

RTECS: VS7700000
anemia, Vomiting, Diarrhea, Cough, Difficulty in breathing, Acute selenium poisoning produces central nervous system effects, which include nervousness, convulsions, and drowsiness. Other signs of intoxication can include skin eruptions, lassitude, gastrointestinal distress, teeth that are discolored or decayed, odorous ("garlic") breath, and partial loss of hair and nails. Chronic exposure by inhalation can produce symptoms that include pallor, coating of the tongue, anemia, irritation of the mucosa, lumbar pain, liver and spleen damage, as well as any of the other previously mentioned symptoms. Chronic contact with selenium compounds may cause garlic odor of breath and sweat, dermatitis, and moderate emotional instability., Dermatitis, garlic-like breath odor, pallor, nervousness, depression
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:

CNS disorders

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Dizziness
muscular weakness
Headache
cardiovascular disorders
Shortness of breath
somnolence
Cough
Unconsciousness

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Selenium:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l End point: mortality Exposure time: 96 h Test Type: semi-static test Analytical monitoring: yes Method: OECD Test Guideline 203 GLP: yes Remarks: (above the solubility limit in the test medium)
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes Remarks: (above the solubility limit in the test medium)
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (algae)): > 100 mg/l Exposure time: 72 h Test Type: static test

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Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: (above the solubility limit in the test medium)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 100 mg/l End point: reproduction rate Exposure time: 21 d Test Type: semi-static test Analytical monitoring: yes Method: OECD Test Guideline 211 GLP: yes Remarks: (above the solubility limit in the test medium)
Toxicity to microorganisms	:	EC50 (activated sludge): > 3,200 mg/l Exposure time: 3 h Test Type: static test Method: OECD Test Guideline 209 GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity	:	This product has no known ecotoxicological effects.
Chronic aquatic toxicity	:	May cause long lasting harmful effects to aquatic life.

Persistence and degradability

Components:

Selenium:

Biodegradability	:	Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

Bioaccumulative potential

Components:

Selenium:

Bioaccumulation	:	Species: Lepomis macrochirus Bioconcentration factor (BCF): 7.7 Exposure time: 60 d Concentration: 640 µg/l
Partition coefficient: n-octanol/water	:	log Pow: 5 Remarks: Not applicable for inorganic substances

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Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

Selenium:

Additional ecological information	:	Discharge into the environment must be avoided.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3288
Proper shipping name	:	Toxic solid, inorganic, n.o.s. (Selenium)
Class	:	6.1
Packing group	:	III
Labels	:	Division 6.1 - Toxic substances
Packing instruction (cargo aircraft)	:	677
Packing instruction (passenger aircraft)	:	670

IMDG-Code

UN number	:	UN 3288
Proper shipping name	:	TOXIC SOLID, INORGANIC, N.O.S. (Selenium)
Class	:	6.1
Packing group	:	III

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Labels	:	6.1
EmS Code	:	F-A, S-A
Marine pollutant	:	no

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National regulation

49 CFR Road

UN/ID/NA number	:	UN 3288
Proper shipping name	:	Toxic solid, inorganic, n.o.s. (Selenium)
Class	:	6.1
Packing group	:	III
Labels	:	Division 6.1 - Toxic substances
ERG Code	:	151
Marine pollutant	:	no
Poison Inhalation Hazard	:	No

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Selenium	7782-49-2	100	100
Selenium	7782-49-2	100	100
Selenium	7782-49-2	10	10 (D010)

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Selenium 7782-49-2 >= 90 - <= 100 %

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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

Selenium	7782-49-2	>= 90 - <= 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Selenium	7782-49-2	>= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

Selenium	7782-49-2	>= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

Selenium	7782-49-2

Pennsylvania Right To Know

Selenium	7782-49-2

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

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NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
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Revision Date : 05/06/2025

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US / EN

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SAFETY DATA SHEET

Version 6.14
Revision Date 11/04/2024
Print Date 11/05/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Sodium

Product Number : 71172
Brand : Aldrich
Index-No. : 011-001-00-0
CAS-No. : 7440-23-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Chemicals which, in contact with water, emit flammable gases (Category 1), H260
Skin corrosion (Category 1B), H314

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Serious eye damage (Category 1), H318
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Long-term (chronic) aquatic hazard (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard Statements

H260	In contact with water releases flammable gases which may ignite spontaneously.
H304	May be fatal if swallowed and enters airways.
H314	Causes severe skin burns and eye damage.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements

P223	Do not allow contact with water.
P231 + P232	Handle under inert gas. Protect from moisture.
P261	Avoid breathing mist or vapors.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P402 + P404	Store in a dry place. Store in a closed container.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Reacts violently with water.

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SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	Na
Molecular weight	:	22.99 g/mol
CAS-No.	:	7440-23-5
EC-No.	:	231-132-9
Index-No.	:	011-001-00-0

Component	Classification	Concentration
sodium		
	1; Skin Corr. 1B; Eye Dam. 1; H260, H314, H318	>= 70 - < 90 %

Kerosine		
	Flam. Liq. 4; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Chronic 2; H227, H315, H336, H304, H411	>= 20 - < 30 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Pulmonary failure possible after aspiration of vomit. Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
Water Foam

5.2 Special hazards arising from the substance or mixture
Sodium oxides
Combustible.
May not get in touch with: Water
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

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Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols. Keep workplace dry. Do not allow product to come into contact with water.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from heat and sources of ignition.
Never allow product to get in contact with water during storage.

Handle and store under inert gas. Air sensitive.

Storage class
Storage class (TRGS 510): 4.3: Hazardous materials, which set free flammable gases upon contact with water

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Kerosine	8008-20-6	TWA	200 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	100 mg/m3	USA. NIOSH Recommended Exposure Limits

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact

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with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 30 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

required

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter type ABEK
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Pieces Color: gray
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting	Melting point/ range: 97.8 °C (208.0 °F) - lit.

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	point/freezing point	
f)	Initial boiling point and boiling range	883 °C 1621 °F - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	No data available
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
sensitive to moisture
Contains the following stabilizer(s):
Kerosine (20 %)

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Moisture.

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10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Acute toxicity estimate Oral - > 5,000 mg/kg
(Calculation method)
Oral: No data available
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Inhalation: No data available

Dermal: No data available

No data available
No data available

Skin corrosion/irritation
Remarks: No data available
Remarks: No data available

Serious eye damage/eye irritation
Remarks: No data available
Remarks: No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

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Aspiration hazard
May be fatal if swallowed and enters airways.

11.2 Additional Information

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. (sodium)

Decomposition of the substance with tissue moisture.
(sodium)
Handle in accordance with good industrial hygiene and safety practice.
(sodium)

SECTION 12: Ecological information

12.1 Toxicity

No data available

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1,640 mg/l - 48 h (sodium) Remarks: (ECOTOX Database)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Biological effects:
Harmful effect due to pH shift.
Possible decomposition products in case of hydrolyzis are:
Sodium hydroxide
Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 1428 Class: 4.3 Packing group: I
Proper shipping name: Sodium
Reportable Quantity (RQ): 12 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1428 Class: 4.3 Packing group: I EMS-No: F-G, S-N
Proper shipping name: SODIUM

IATA
UN number: 1428 Class: 4.3 Packing group: I
Proper shipping name: Sodium
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
sodium	7440-23-5	10	12

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Reactivity Hazard
Acute Health Hazard

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

sodium	7440-23-5	>= 70 - < 90 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

sodium	7440-23-5	>= 70 - < 90 %

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

sodium	7440-23-5
Kerosine	8008-20-6

Pennsylvania Right To Know

sodium	7440-23-5
Kerosine	8008-20-6

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SECTION 16: Other information

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.14 Revision Date: 11/04/2024 Print Date: 11/05/2024

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

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1 Identification

· **Product identifier**

· **Trade name: tert-Butanol**

· **Part number:** WRK-120H
· **CAS Number:**
75-65-0
· **EC number:**
200-889-7
· **Index number:**
603-005-00-1
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
2-methylpropan-2-ol
· **Hazard statements**
Highly flammable liquid and vapor.

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Safety Data Sheet
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Trade name: tert-Butanol

(Contd. of page 1)

Harmful if inhaled.
Causes serious eye irritation.
May cause respiratory irritation.

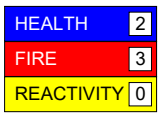
· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a poison center/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
75-65-0 2-methylpropan-2-ol
· **Identification number(s)**
· **EC number:** 200-889-7
· **Index number:** 603-005-00-1

(Contd. on page 3)

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4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
150 ppm

· **PAC-2:**
1,300 ppm

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Safety Data Sheet
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· **PAC-3:**
8000* ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
75-65-0 2-methylpropan-2-ol	
PEL	Long-term value: 300 mg/m³, 100 ppm
REL	Short-term value: 450 mg/m³, 150 ppm Long-term value: 300 mg/m³, 100 ppm
TLV	Long-term value: 303 mg/m³, 100 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

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· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Crystalline
Color:	Colorless
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	26 °C (78.8 °F)
Boiling point/Boiling range:	83 °C (181.4 °F)
· **Flash point:**	11 °C (51.8 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	2.3 Vol %
Upper:	8 Vol %
· **Vapor pressure at 20 °C (68 °F):**	41 hPa (30.8 mm Hg)
· **Density at 20 °C (68 °F):**	0.775 g/cm³ (6.46738 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.

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(Contd. of page 5)

· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with Water:**	Fully miscible.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Oral	LD50	2,743 mg/kg (rat)
Dermal	LD50	>2,000 mg/kg (rabbit)
Inhalative	LC50/4 h	11 mg/L

75-65-0 2-methylpropan-2-ol

Oral	LD50	2,743 mg/kg (rat)
Dermal	LD50	>2,000 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

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· **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1120
· **UN proper shipping name**	
· **DOT**	Butanols
· **IMDG, IATA**	BUTANOLS
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	3 Flammable liquids
· **Label**	3

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Safety Data Sheet
acc. to OSHA HCS

Trade name: tert-Butanol

(Contd. of page 7)

· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-06
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1120 BUTANOLS, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

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(Contd. of page 8)

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 4: Acute toxicity – Category 4
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 4 Reviewed on 03/25/2019

*
1 Identification

· **Product identifier**

· **Trade name: Tetrachloroethene**

· **Part number:** RHH-023
· **CAS Number:**
127-18-4
· **EC number:**
204-825-9
· **Index number:**
602-028-00-4
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

*
2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS08 Health hazard

Carc. 1B H350 May cause cancer.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**




GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
tetrachloroethylene
· **Hazard statements**
Causes skin irritation.
May cause an allergic skin reaction.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Tetrachloroethene

(Contd. of page 1)

May cause cancer.

· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 1
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *1
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
127-18-4 tetrachloroethylene
· **Identification number(s)**
· **EC number:** 204-825-9
· **Index number:** 602-028-00-4

*
4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 2)

· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

*
6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
35 ppm
· **PAC-2:**
230 ppm
· **PAC-3:**
1,200 ppm

*
7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
127-18-4 tetrachloroethylene	
PEL	Long-term value: 100 ppm Ceiling limit value: 200; 300* ppm *5-min peak in any 3 hrs
REL	Minimize workplace exp. concs.;Pocket Guide App. A
TLV	Short-term value: 685 mg/m³, 100 ppm Long-term value: 170 mg/m³, 25 ppm BEI

· **Ingredients with biological limit values:**	
127-18-4 tetrachloroethylene	
BEI	3 ppm Medium: end-exhaled air Time: prior to shift Parameter: Tetrachloroethylene 0.5 mg/L Medium: blood Time: prior to shift Parameter: Tetrachloroethylene

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the skin.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 4)

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

*
9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Like chlorine
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-23.5 °C (-10.3 °F)
Boiling point/Boiling range:	121.1 °C (250 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	13 hPa (9.8 mm Hg)
· **Density at 20 °C (68 °F):**	1.6 g/cm³ (13.352 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	0.4 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Viscosity:**

Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

*
11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,629 mg/kg (rat)
Inhalative	LC50/4 h	4,000 mg/L (rat)

127-18-4 tetrachloroethylene		
Oral	LD50	2,629 mg/kg (rat)
Inhalative	LC50/4 h	4,000 mg/L (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** No irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
2A

· **NTP (National Toxicology Program)**
R

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

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12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

*
14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1897
· **UN proper shipping name**	
· **DOT**	Tetrachloroethylene
· **IMDG**	TETRACHLOROETHYLENE, MARINE POLLUTANT
· **IATA**	TETRACHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IATA**	
· **Class**	6.1 Toxic substances

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Tetrachloroethene

(Contd. of page 7)

· **Label**	6.1
· **IMDG**	
	
· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	6.1-02
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	100 lbs, 45.4 kg
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 1897 TETRACHLOROETHYLENE, 6.1, III

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

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Safety Data Sheet
acc. to OSHA HCS

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· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
L

· **TLV (Threshold Limit Value established by ACGIH)**
A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **National regulations:**

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 3
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit

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Safety Data Sheet
acc. to OSHA HCS

Trade name: Tetrachloroethene

(Contd. of page 9)

BEI: Biological Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Skin Sens. 1: Skin sensitisation – Category 1
Carc. 1B: Carcinogenicity – Category 1B

· *** Data compared to the previous version altered.**

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 3 Reviewed on 01/29/2019

1 Identification

· **Product identifier**

· **Trade name: Tetrahydrofuran**

· **Part number:** RCC-199
· **CAS Number:**
109-99-9
· **EC number:**
203-726-8
· **Index number:**
603-025-00-0
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.


GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS02 GHS07 GHS08

· **Signal word** Danger

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 3 Reviewed on 01/29/2019

Trade name: Tetrahydrofuran

(Contd. of page 1)

· **Hazard-determining components of labeling:**
tetrahydrofuran
· **Hazard statements**
Highly flammable liquid and vapor.
Causes serious eye irritation.
Suspected of causing cancer.
May cause respiratory irritation.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

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Safety Data Sheet
acc. to OSHA HCS

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Trade name: Tetrahydrofuran

(Contd. of page 2)

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
109-99-9 tetrahydrofuran
· **Identification number(s)**
· **EC number:** 203-726-8
· **Index number:** 603-025-00-0

4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 4)

(Contd. of page 3)

· **Protective Action Criteria for Chemicals**

· **PAC-1:**
100 ppm
· **PAC-2:**
500 ppm
· **PAC-3:**
5000* ppm

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
109-99-9 tetrahydrofuran	
PEL	Long-term value: 590 mg/m³, 200 ppm
REL	Short-term value: 735 mg/m³, 250 ppm Long-term value: 590 mg/m³, 200 ppm
TLV	Short-term value: 295 mg/m³, 100 ppm Long-term value: 147 mg/m³, 50 ppm Skin

· **Ingredients with biological limit values:**	
109-99-9 tetrahydrofuran	
BEI	2 mg/L Medium: urine Time: end of shift Parameter: Tetrahydrofuran

(Contd. on page 5)

(Contd. of page 4)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours
· **Eye protection:**



Tightly sealed goggles

*

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Ether-like
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-108.5 °C (-163.3 °F)
Boiling point/Boiling range:	65.5 °C (149.9 °F)

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Safety Data Sheet
acc. to OSHA HCS

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· **Flash point:**	-21 °C (-5.8 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	230 °C (446 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	1.5 Vol %
Upper:	12 Vol %
· **Vapor pressure at 20 °C (68 °F):**	150 hPa (112.5 mm Hg)
· **Density at 20 °C (68 °F):**	0.89 g/cm³ (7.42705 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Fully miscible.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 890.0 g/l / 7.43 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,500 mg/kg (rat)

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Safety Data Sheet
acc. to OSHA HCS

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109-99-9 tetrahydrofuran		
Oral	LD50	2,500 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)
Substance is not listed.

· NTP (National Toxicology Program)
Substance is not listed.

· OSHA-Ca (Occupational Safety & Health Administration)
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN2056
· **UN proper shipping name**	
· **DOT**	Tetrahydrofuran
· **IMDG, IATA**	TETRAHYDROFURAN
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	3-06
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	1000 lbs, 454 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 2056 TETRAHYDROFURAN, 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

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Safety Data Sheet
acc. to OSHA HCS

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· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
SC

· **TLV (Threshold Limit Value established by ACGIH)**
A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 2
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit

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Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 3 Reviewed on 01/29/2019

Trade name: Tetrahydrofuran

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REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.16
Revision Date 05/15/2024
Print Date 07/13/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Toluene

Product Number : 270377
Brand : Aldrich
Index-No. : 601-021-00-3
CAS-No. : 108-88-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, H373
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word: Danger

Hazard Statements

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs (Central nervous system) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe mist or vapors.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_7H_8
Molecular weight	:	92.14 g/mol
CAS-No.	:	108-88-3
EC-No.	:	203-625-9
Index-No.	:	601-021-00-3

Component	Classification	Concentration
Toluene		
	Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 3; H225, H315, H361, H336, H373, H304, H401, H412 Concentration limits: 20 %: STOT SE 3, H336;	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

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If swallowed
After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Toluene	108-88-3	TWA	100 ppm 375 mg/m3	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
		STEL	150 ppm 560 mg/m3	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
		TWA	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
	Remarks	Z37.12-1967		
		CEIL	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.12-1967		

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		Peak	500 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.12-1967		
		TWA	20 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Visual impairment Female reproductive Pregnancy loss 2023 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	100 ppm 375 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	150 ppm 560 mg/m3	USA. NIOSH Recommended Exposure Limits

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Toluene	108-88-3	Toluene	0.02 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to last shift of workweek			
		Toluene	0.03 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			
		o-Cresol	0.3mg/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Inhalation	Acute systemic effects	384 mg/m3
Workers	Inhalation	Acute local effects	384 mg/m3
Workers	Skin contact	Long-term systemic effects	384mg/kg BW/d
Workers	Inhalation	Long-term systemic effects	192 mg/m3
Workers	Inhalation	Long-term local effects	192 mg/m3
Consumers	Inhalation	Acute systemic effects	226 mg/m3
Consumers	Inhalation	Acute local effects	226 mg/m3
Consumers	Skin contact	Long-term systemic effects	226mg/kg BW/d
Consumers	Inhalation	Long-term systemic effects	56.5 mg/m3
Consumers	Ingestion	Long-term systemic effects	8.13mg/kg BW/d

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Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	2.89 mg/kg
Sea water	0.68 mg/l
Fresh water	0.68 mg/l
Sea sediment	16.39 mg/kg
Fresh water sediment	16.39 mg/kg
Sewage treatment plant	13.61 mg/l
Aquatic intermittent release	0.68 mg/l

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

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required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odor	benzene-like
c)	Odor Threshold	0.2 ppm
d)	pH	Not applicable
e)	Melting point/freezing point	Melting point/range: -93 °C (-135 °F) - lit.
f)	Initial boiling point and boiling range	110 - 111 °C 230 - 232 °F - lit.
g)	Flash point	4.4 °C (39.9 °F) - closed cup - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7.1 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapor pressure	30.88 hPa at 21.1 °C (70.0 °F)
l)	Vapor density	3.18
m)	Density	0.865 g/mL at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	0.58 g/l at 25 °C (77 °F) - partly soluble
o)	Partition coefficient: n-octanol/water	log Pow: 2.73 at 20 °C (68 °F) - Bioaccumulation is not expected.
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	none

9.2 Other safety information

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Conductivity	< 0.01 µS/cm
Surface tension	27.73 mN/m at 0.516g/l at 25 °C (77 °F)
Relative vapor density	3.18

SECTION 10: Stability and reactivity

10.1 Reactivity

Vapors may form explosive mixture with air.
Vapors may form explosive mixture with air.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Risk of explosion with:
fuming sulfuric acid
Nitric acid
silver
perchlorates
nitrogen dioxide
nonmetallic halides
halogen-halogen compounds
uranium hexafluoride
organic nitro compounds
Violent reactions possible with:
Strong acids
Strong oxidizing agents
sulfur
with
Heat.

10.4 Conditions to avoid

Warming.
Warming.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 5,580 mg/kg
(Directive 67/548/EEC, Annex V, B.1.)
LC50 Inhalation - Rat - male - 4 h - 25.7 mg/l - vapor

(OECD Test Guideline 403)
LD50 Dermal - Rabbit - male - > 5,000 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: irritating - 4 h
(Regulation (EC) No. 440/2008, Annex, B.4)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(Regulation (EC) No. 440/2008, Annex, B.6)

Germ cell mutagenicity
Test Type: In vitro mammalian cell gene mutation test
Test system: Mouse lymphoma test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: Regulation (EC) No. 440/2008, Annex, B.13/14 (Ames test)
Result: negative

Test Type: Chromosome aberration test
Species: Rat
Cell type: Bone marrow
Application Route: Intraperitoneal

Result: negative
Remarks: (ECHA)

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

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OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure
Inhalation - May cause drowsiness or dizziness. - Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure
Inhalation - May cause damage to organs through prolonged or repeated exposure.
- Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
Aspiration may cause pulmonary edema and pneumonitis.

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 13 Weeks - NOAEL (No observed adverse effect level) - 625 mg/kg - LOAEL (Lowest observed adverse effect level) - 1,250 mg/kg

RTECS: XS5250000
Drowsiness, irritant effects, Dizziness, Convulsions, Headache, Nausea, Vomiting, Circulatory collapse, somnolence, inebriation, Unconsciousness, respiratory arrest, CNS disorders, respiratory paralysis, death
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Oncorhynchus kisutch (coho salmon) - 5.5 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Ceriodaphnia dubia (water flea) - 3.78 mg/l - 48 h (US-EPA)
Toxicity to bacteria	static test EC50 - Bacteria - 84 mg/l - 24 h Remarks: (ECHA)
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - Oncorhynchus kisutch (coho salmon) - 1.39 mg/l - 40 d Remarks: (ECHA)

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Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	NOEC - Ceriodaphnia dubia (water flea) - 0.74 mg/l - 7 d (US-EPA)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 20 d Result: 86 % - Readily biodegradable. Remarks: (IUCLID)

12.3 Bioaccumulative potential

Bioaccumulation	Leuciscus idus (Golden orfe) - 3 d - 0.05 mg/l(Toluene) Bioconcentration factor (BCF): 90

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)

UN number: 1294 Class: 3 Packing group: II
Proper shipping name: Toluene
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

IMDG

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UN number: 1294 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: TOLUENE

IATA
UN number: 1294 Class: 3 Packing group: II
Proper shipping name: Toluene

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Toluene	108-88-3	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.Toluene	108-88-3	2009-02-01

SECTION 16: Other information

Further information
The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.
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Version: 6.16 Revision Date: 05/15/2024 Print Date: 07/13/2024

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Chemical Safety Data Sheet MSDS / SDS

Polychlorinated Biphenyls (PCBs)

Revision Date:2025-01-11 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name	: Polychlorinated Biphenyls (PCBs)
CBnumber	: CB7160460
CAS	: 1336-36-3
EINECS Number	: 215-648-1
Synonyms	: PYRANOL,polychlorinated biphenyls

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	: For R&D use only. Not for medicinal, household or other use.
Uses advised against	: none

Company Identification

Company	: Chemicalbook
Address	: Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone	: 010-86108875

SECTION 2: Hazards identification

Classification of the substance or mixture

Specific target organ toxicity – repeated exposure, Category 2

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

Label elements

Pictogram(s)

Signal word	Warning

Hazard statement(s)

H373 May cause damage to organs through prolonged or repeated exposure

H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P273 Avoid release to the environment.

Response

P319 Get medical help if you feel unwell.

P391 Collect spillage.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Polychlorinated Biphenyls (PCBs)
Synonyms	: PYRANOL,polychlorinated biphenyls
CAS	: 1336-36-3
EC number	: 215-648-1
MF	: N/A
MW	: 0

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

no data available

Indication of any immediate medical attention and special treatment needed

If PCB-containing substances have been ingested recently, gastric decontamination may be reasonable. Activated charcoal has not been proven beneficial, but is not contraindicated.

SECTION 5: Firefighting measures

Extinguishing media

Use dry chemical, carbon dioxide, or alcohol foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors, or shows any signs of deforming), withdraw immediately to a secure position ... The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive pressure mode.

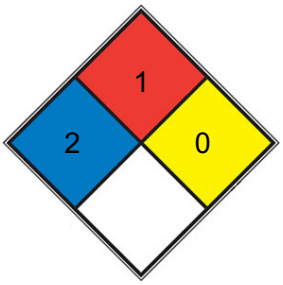
Specific Hazards Arising from the Chemical

no data available

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



■	HEALTH	2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. diethyl ether, ammonium phosphate, iodine)
■	FIRE	1	Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. mineral oil, ammonia)
■	REACT	0	Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium,N2)
□	SPEC. HAZ.		

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours.Avoid contacting with skin and eye. Use personal protective equipment.Wear chemical impermeable gloves. Ensure adequate ventilation.Remove all sources of ignition. Evacuate personnel to safe areas.Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Dry sand or earth should be spread on the leak, or spill area. ...

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

PCB material should be stored in closed containers, in ventilated areas ... PCB's should be handled in isolated areas of the plant, where efficient ventilation systems remove airborne PCB's. ...

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	1,1'-Biphenyl, chloro derivs.			
CAS No.	1336-36-3			
	Limit value - Eight hours		**Limit value - Short term**	
	ppm	**mg/m^3**	**ppm**	**mg/m^3**
Canada - Ontario	?	0,05 (1)	?	?
Denmark	?	0,01	?	0,02
Finland	?	0,003 (1)	?	?
Germany (DFG)	?	0,003 (1)(2)(3)(5)	?	0,024 (1)(2)(3)(4)(5)
Hungary	?	POP	?	?
Ireland	?	0,1	?	?
Japan	?	0,01	?	?
Japan - JSOH	?	0,01	?	?
Latvia	?	1	?	?
New Zealand	?	0,1	?	?
Poland	?	1	?	?
Sweden	?	0,01	?	0,03 (1)
Switzerland	0,05	0,5	0,4	4
United Kingdom	?	0,1	?	?
	Remarks			
Canada - Ontario	(1) as sum of components assayed by chromatographic procedure with reference of the bulk sample			
Finland	(1) Total PCB = 5*([PCB 28] + [PCB 52] + [PCB 101] + [PCB 138] + [PCB 153] + [PCB 180])			

Germany (AGS)	(1) 42% Chlorine (CAS-No. 53469-21-9) (2) 54% Chlorine (CAS-No. 11097-69-1)
Germany (DFG)	(1) Only for chlorinated biphenyls with Cl
Hungary	POP Persistent Organic Pollutant
Sweden	(1) Short-term value, 15 minutes average value

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	no data available
Colour	Vary from mobile oily liquids to white crystalline solids and hard noncrystalline resins.
Odour	Practically odorless; mild aromatic odor
Melting point/freezing point	no data available
Boiling point or initial boiling point and boiling range	340～375
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	195(O.C)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Solubility in water is extremely low; soluble in oils and organic solvents.
Partition coefficient n-octanol/water	... literature Kow values will vary. These increase with increasing chlorination. log Kow values at 25 deg C: 3.76 (biphenyl); 5.7 (Cl4-PCB's); 6.0 (Cl5-PCB's); 7.0 (Cl6-PCB's); 8.26 (Cl10-PCB's).

Vapour pressure	2.04E-07mmHg at 25°C
Density and/or relative density	1.44(30°C)
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

Chemical stability

PCB's are chemically very inert and are stable to conditions of hydrolysis and oxidation in industrial use. Photochemical degradation may be one route of their breakdown in the environment. ...

Possibility of hazardous reactions

Flame resistant.

Conditions to avoid

no data available

Incompatible materials

Liquid chlorine reacts exothermically with polychlorinated biphenyl heat transfer liquid. Polychlorinated biphenyl

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of Chloride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Mouse (C57B1/6J) male oral 19 mg/kg/28 day
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA: Possibly carcinogenic to humans, IARC: Probably carcinogenic to humans, NTP: Known to be a human carcinogen

Reproductive toxicity

An epidemiological study of women occupationally exposed to high levels of PCBs suggested a relationship between PCB exposure and reduced birth weight and shortened gestational age of their babies; however, limitations of the study limit the strength of the conclusion. Two series of human studies that investigated exposure to PCBs through the consumption of contaminated fish suggest that exposure to PCBs may cause developmental effects in humans. Both studies reported an association between consumption of fish with high PCB levels by pregnant women and an increased incidence of neurodevelopmental effects, such as motor deficits at birth, impaired psychomotor index, impaired visual recognition, and deficits in short-term memory in infants. Human studies are not conclusive on the reproductive effects of PCBs. One study of men who were occupationally exposed to PCBs showed no fertility abnormalities, while another study of men with low sperm counts found elevated levels of PCBs in the blood and an association between certain PCB compounds in semen and decreased sperm motility. Animal studies have reported developmental effects, such as learning deficits, impaired immune functions, focal liver necrosis, and cellular alterations of the thyroid, in the offspring of animals exposed orally to PCBs. Reproductive effects, such as decreased fertility, decreased conception, and prolonged menstruation have also been noted in animal studies of dietary PCB exposures.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: EC50; Species: Pseudokirchneriella subcapitata (green algae); Conditions: freshwater, static, 22 deg C; Concentration: 182 nmol/L for 48 hr; Effect: decreased population biomass />98% pure

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: The microbial mineralization of three chlorophenols and a PCB mixture was studied using natural bacterial assemblages in laboratory model systems. The systems consisted of water and surface sediment from two lake types: one with a high content of humic substances and the other with a low content. Final PCB concentration in the model systems was 38 ug/L. Aerobic mineralization of the (14)C-ring-labelled compounds was determined as production of (14)CO2 in the systems over the course of 60 days. Mineralization of PCBs in the systems was low compared to the aromatics. The breakdown of PCB was 0.047 nM in the humic cultures and 0.052 nM in cultures from the clear water lake. The avg mineralization rates of PCBs over the 60 day test period for the clear-water and humic cultures were 1.1 and 1.2

pM/day. More than 90% of the PCBs adsorbed to the sediment, while <1% was found in the water phase.

Bioaccumulative potential

Polychlorinated biphenyls (PCBs) are highly lipophilic and bioconcentrate in tissue from concentrations in water ...

Mobility in soil

PCB mobility in aqueous soil-sediment systems has reported experimental Koc values ranging from 510 to 13,300,000 for a variety of Aroclors and PCB congeners; reported Koc values were mostly above 5000(1). Reviews of the PCB mobility literature have found that adsorption of PCBs to soil and sediment generally increases with an increase in the degree of chlorination(2,3). Organic solvents, found at hazardous waste sites, will also increase the solubility and mobility of PCBs(3). Using soil TLC, column leaching and five different soils, PCBs were found to be generally immobile when leached with water or aqueous landfill leachate, but highly mobile when leached with organic solvents(4). PCB fluids can penetrate and travel through the cracks and other connected void spaces found in soil formations(5). In the presence of organic material dissolved from soil, the water solubility of PCBs increases which may augment its leachability. Environmental releases of PCBs often accompany releases of carrier materials from utility equipment. The PCBs that are present in the mineral oil-PCB mixture become even less water soluble than before. This is due to the PCB partitioning into the mineral oil and the reduced interaction of the PCBs with precipitation or groundwater caused by the hydrophobic nature of the oil matrix. The volatility of PCBs also affects their migration through the soil profile. Researchers have carried out simulations that indicate that PCBs can volatilize beneath the soil surface and potentially migrate through several meters of soil cover(5).

Toxics Screening Level

The Initial Risk Screening Level (IRSL) for polychlorinated biphenyls is 0.01 µg/m3 based on an annual averaging time.

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Disclaimer:
The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/25/2019 Version Number 2 Reviewed on 03/25/2019

*

1 Identification

· **Product identifier**

· **Trade name: Trichloroethene**

· **Part number:** RHH-022
· **CAS Number:**
79-01-6
· **EC number:**
201-167-4
· **Index number:**
602-027-00-9
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS08 Health hazard

Muta. 2	H341	Suspected of causing genetic defects.
Carc. 1B	H350	May cause cancer.



GHS07

Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2A	H319	Causes serious eye irritation.
STOT SE 3	H336	May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS07



GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
trichloroethylene

(Contd. on page 2)

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Trade name: Trichloroethene

(Contd. of page 1)

· **Hazard statements**
Causes skin irritation.
Causes serious eye irritation.
Suspected of causing genetic defects.
May cause cancer.
May cause drowsiness or dizziness.
· **Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Call a poison center/doctor if you feel unwell.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *2
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
79-01-6 trichloroethylene
· **Identification number(s)**
· **EC number:** 201-167-4

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· **Index number:** 602-027-00-9

4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Not required.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
130 ppm
· **PAC-2:**
450 ppm
· **PAC-3:**
3,800 ppm

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 3)

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
79-01-6 trichloroethylene	
PEL	Long-term value: 100 ppm Ceiling limit value: 200; 300* ppm *5-min peak in any 2 hrs
REL	See Pocket Guide Apps. A and C
TLV	Short-term value: 135 mg/m³, 25 ppm Long-term value: 54 mg/m³, 10 ppm BEI

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acc. to OSHA HCS

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· **Ingredients with biological limit values:**

79-01-6 trichloroethylene

BEI	15 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Trichloroacetic acid (nonspecific) 0.5 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethanol without hydrolysis (nonspecific) - Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative) - Medium: end-exhaled air Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.
· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.
· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

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· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Like chlorine
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-86.4 °C (-123.5 °F)
Boiling point/Boiling range:	87 °C (188.6 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	410 °C (770 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	7.9 Vol %
Upper:	90 Vol %
· **Vapor pressure at 20 °C (68 °F):**	60 hPa (45 mm Hg)
· **Density at 20 °C (68 °F):**	1.46 g/cm³ (12.1837 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water at 20 °C (68 °F):	1 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 1,460.0 g/l / 12.18 lb/gal

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· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,402 mg/kg (mouse)

79-01-6 trichloroethylene		
Oral	LD50	2,402 mg/kg (mouse)
		4,290 mg/kg (rat)
Dermal	LD50	8,450 mg/kg (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
1

· **NTP (National Toxicology Program)**
K

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.

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· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (Assessment by list): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1710
· **UN proper shipping name**	
· **DOT**	Trichloroethylene
· **IMDG, IATA**	TRICHLOROETHYLENE
· **Transport hazard class(es)**	
· **DOT, IMDG, IATA**	



· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	6.1-02
· **Segregation groups**	Liquid halogenated hydrocarbons
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

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· **Transport/Additional information:**

· **DOT**

· **Quantity limitations**	On passenger aircraft/rail: 60 L On cargo aircraft only: 220 L
· **Hazardous substance:**	100 lbs, 45.4 kg

· **IMDG**

· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 1710 TRICHLOROETHYLENE, 6.1, III

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is listed.

· **Chemicals known to cause developmental toxicity:**
Substance is listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
CaH

· **TLV (Threshold Limit Value established by ACGIH)**
A2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is listed.

· **National regulations:**
· **Additional classification according to Decree on Hazardous Materials:**
Carcinogenic hazardous material group I (extremely dangerous).

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Trade name: Trichloroethene

(Contd. of page 9)

Carcinogenic hazardous material group II (very dangerous).
Carcinogenic hazardous material group III (dangerous).

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/25/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Muta. 2: Germ cell mutagenicity – Category 2
Carc. 1B: Carcinogenicity – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

SAFETY DATA SHEET

Version 6.4
Revision Date 05/31/2021
Print Date 01/13/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Trichlorofluoromethane

Product Number : 254991
Brand : Aldrich
CAS-No. : 75-69-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Hazardous to the ozone layer (Category 1), H420

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Warning

Hazard statement(s)
H420 Harms public health and the environment by destroying ozone in the upper atmosphere.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Precautionary statement(s)

P502	Refer to manufacturer/ supplier for information on recovery/ recycling.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Fluorotrichloromethane CFC-11
Formula	:	CCl3F
Molecular weight	:	137.37 g/mol
CAS-No.	:	75-69-4
EC-No.	:	200-892-3

Component	Classification	Concentration
Trichlorofluoromethane		
	Ozone 1; H420	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Hydrogen chloride gas
Hydrogen fluoride
Not combustible.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed.

Storage stability
Recommended storage temperature
2 - 8 °C

Contents under pressure.
Storage class (TRGS 510): 10: Combustible liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Trichlorofluoromethane	75-69-4	C	1,000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		
		C	1,000 ppm 5,600 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1,000 ppm 5,600 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		C	1,000 ppm 5,600 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Respiratory protection
Not required; except in case of aerosol formation.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Color: colorless
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -111.0 - -110.0 °C (-167.8 - -166.0 °F)
f)	Initial boiling point and boiling range	23.7 °C 74.7 °F - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid,	No data available

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gas)

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	885.7 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	No data available
m)	Relative density	No data available
n)	Water solubility	1 g/l
o)	Partition coefficient: n-octanol/water	log Pow: 2.53 - Bioaccumulation is not expected.
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension 18.0 mN/m at 25.0 °C (77.0 °F)

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

no information available

10.5 Incompatible materials

Strong oxidizing agents, Sodium/sodium oxides, Potassium, Magnesium, Aluminum, Zinc

10.6 Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - > 15,000 mg/kg

Inhalation: No data available

Dermal: No data available

No data available

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Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: PB6125000
Nausea, Dizziness, Headache, Vomiting, Diarrhea, Abdominal pain, Weakness, Unconsciousness
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

The life science business of Merck KGaA, Darmstadt, Germany
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12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 3082 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Trichlorofluoromethane)
Reportable Quantity (RQ): 5000 lbs
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Trichlorofluoromethane	75-69-4	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard

Reportable Quantity : F002 lbs

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

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SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.4 Revision Date: 05/31/2021 Print Date: 01/13/2024

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SAFETY DATA SHEET

Version 6.7
Revision Date 08/23/2023
Print Date 08/23/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Vinyl acetate

Product Number : V1503
Brand : Aldrich
Index-No. : 607-023-00-0
CAS-No. : 108-05-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Short-term (acute) aquatic hazard (Category 3), H402
Long-term (chronic) aquatic hazard (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

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Pictogram	
Signal Word	Danger

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing mist or vapors.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Acetoxyethylene
Formula	:	$C_4H_6O_2$
Molecular weight	:	86.09 g/mol
CAS-No.	:	108-05-4
EC-No.	:	203-545-4

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Index-No. : 607-023-00-0

Component	Classification	Concentration
vinyl acetate		
	Flam. Liq. 2; Acute Tox. 4; Carc. 2; STOT SE 3; Aquatic Acute 3; Aquatic Chronic 3; H225, H332, H351, H335, H402, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Foam Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

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5.2 Special hazards arising from the substance or mixture

Carbon oxides
Flash back possible over considerable distance., Container explosion may occur under fire conditions.
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.
Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

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7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage stability
Recommended storage temperature
2 - 8 °C

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
vinyl acetate	108-05-4	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans		
		STEL	15 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Confirmed animal carcinogen with unknown relevance to humans		
		C	4 ppm 15 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	10 ppm 30 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	15 ppm 45 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

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Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 240 min
Material tested:Butoject® (KCL 898)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Color: colorless
b)	Odor	fruity
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -93 °C (-135 °F) - lit.
f)	Initial boiling point and boiling range	72 - 73 °C 162 - 163 °F - lit.
g)	Flash point	-8 °C (18 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13.4 %(V) Lower explosion limit: 2.6 %(V)

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k)	Vapor pressure	113 hPa at 20 °C (68 °F)
l)	Vapor density	No data available
m)	Density	0.934 g/cm3 at 25 °C (77 °F) - lit.
	Relative density	No data available
n)	Water solubility	20 g/l at 20 °C (68 °F) - completely soluble
o)	Partition coefficient: n-octanol/water	log Pow: 0.73 at 25 °C (77 °F) - Bioaccumulation is not expected.
p)	Autoignition temperature	402 °C (756 °F) at 1,013 hPa
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Vapors may form explosive mixture with air.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Unstable upon depletion of inhibitor.

10.4 Conditions to avoid
Warming.

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 2,900 mg/kg
(Calculation method)
LD50 Oral - Rat - 2,900 mg/kg
Remarks: (RTECS)
Symptoms: Gastrointestinal disturbance, Risk of aspiration upon vomiting., Pulmonary failure possible after aspiration of vomit.
Acute toxicity estimate Inhalation - 4 h - 11.4 mg/l - vapor(Calculation method)

LC50 Inhalation - Rat - 4 h - 11.4 mg/l - vapor

Remarks: (RTECS)
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
LD50 Dermal - Rabbit - male - 7,440 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)
Remarks: Drying-out effect resulting in rough and chapped skin.
Possible damages:
slight irritation

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Human lymphocytes
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: positive
Test Type: Micronucleus test
Test system: human lymphoblastoid cells
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 487
Result: negative

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Test Type: In vitro mammalian cell gene mutation test
Test system: human lymphoblastoid cells
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 490
Result: positive

Test Type: Genotoxicity in vivo
Species: Mouse
Cell type: sperm
Application Route: Intraperitoneal

Result: negative
Remarks: (ECHA)

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: OECD Test Guideline 474
Result: Positive results were obtained in some in vivo tests.

Carcinogenicity
Suspected of causing cancer.

IARC:	2B - Group 2B: Possibly carcinogenic to humans (vinyl acetate)
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause respiratory irritation. - Respiratory system

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Mouse - female - Oral - 3 Months - NOAEL (No observed adverse effect level) - 281 mg/kg

RTECS: AK0875000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After uptake:

Systemic effects:

Dizziness

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somnolence
Unconsciousness

Absorption can result in damage to:

Liver
Kidney

Effect potentiated by: ethanol

This substance should be handled with particular care.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 12.6 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	ErC50 - Pseudokirchneriella subcapitata - 12.7 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - Pimephales promelas (fathead minnow) - 0.55 mg/l - 34 d (OECD Test Guideline 210)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 14 d Result: 82 - 98 % - Readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)

UN number: 1301 Class: 3 Packing group: II
Proper shipping name: Vinyl acetate, stabilized
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1301 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: VINYL ACETATE, STABILIZED

IATA

UN number: 1301 Class: 3 Packing group: II
Proper shipping name: Vinyl acetate, stabilized

SECTION 15: Regulatory information

SARA 302 Components

	CAS-No.	Revision Date
vinyl acetate	108-05-4	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
vinyl acetate	108-05-4	2008-11-03

Massachusetts Right To Know Components

	CAS-No.	Revision Date
vinyl acetate	108-05-4	2008-11-03
hydroquinone	123-31-9	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
vinyl acetate	108-05-4	2008-11-03

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SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.7 Revision Date: 08/23/2023 Print Date: 08/23/2023

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SAFETY DATA SHEET

Version 5.10
Revision Date 08/06/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Xylenes

Product Number : 214736
Brand : Aldrich
Index-No. : 601-022-00-9

CAS-No. : 1330-20-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 3), H226
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, Liver, Kidney, H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs (Central nervous system, Liver, Kidney) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.

Precautionary statement(s)	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P314	Get medical advice/ attention if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Xylene mixture of isomers
Formula	:	C_8H_{10}
Molecular weight	:	106.17 g/mol
CAS-No.	:	1330-20-7
EC-No.	:	215-535-7
Index-No.	:	601-022-00-9
Registration number	:	01-2119488216-32-XXXX

Hazardous components

Component	Classification	Concentration
Xylene		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; H226, H304, H315, H332, H335, H373, H401	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Xylene	1330-20-7	STEL	150 ppm 655 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	100 ppm 435 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	100 ppm 435 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	The value in mg/m3 is approximate.		
		TWA	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	150 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Methylhippuric acids	1.5g/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber

Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 35 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	< 0 °C (< 32 °F)
f)	Initial boiling point and boiling range	137 - 140 °C (279 - 284 °F) - lit.
g)	Flash point	25 °C (77 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.1 %(V)
k)	Vapour pressure	24 hPa (18 mmHg) at 37.70 °C (99.86 °F)
l)	Vapour density	3.67 - (Air = 1.0)
m)	Relative density	0.86 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition	No data available

	temperature	
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	3.67 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 3,523 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: Irritations
Remarks: (IUCLID)

Drying-out effect resulting in rough and chapped skin. After long-term exposure to the chemical: Dermatitis

Serious eye damage/eye irritation
Respiratory or skin sensitisation
In animal experiments: - Mouse
Result: Does not cause skin sensitisation.
(OECD Test Guideline 429)

Germ cell mutagenicity
Mutagenicity (mammal cell test): chromosome aberration.
Result: negative
(National Toxicology Program)

Ames test
Salmonella typhimurium
Result: negative

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

Specific target organ toxicity - single exposure
May cause respiratory irritation. - Respiratory system
Acute oral toxicity - Gastrointestinal disturbance
Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract, Inhalation may lead to the formation of oedemas in the respiratory tract.

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure. - Central nervous system, Liver, Kidney

Aspiration hazard
Aspiration hazard, Aspiration may cause pulmonary oedema and pneumonitis.

Additional Information
RTECS: Not available

Blurred vision, Incoordination., Headache, Nausea, Vomiting, Dizziness, Weakness, anemia, Prolonged or repeated exposure to skin causes defatting and dermatitis.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:
Systemic effects:
Headache, somnolence, Dizziness, euphoria, agitation, spasms, respiratory paralysis, Unconsciousness, narcosis, inebriation
Effect potentiated by: ethanol
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

12.2 Persistence and degradability

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1307 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: XYLENES

IATA
UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs (/$/*_2ORG_REP_INH/$/) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.
Skin Irrit.	Skin irritation

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the

product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10 Revision Date: 08/06/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Zinc

Product Number : 324930
Brand : Aldrich
Index-No. : 030-001-00-1

CAS-No. : 7440-66-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Pyrophoric solids (Category 1), H250
Self-heating substances and mixtures (Category 1), H251
Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H250 Catches fire spontaneously if exposed to air.
H251 Self-heating: may catch fire.
H260 In contact with water releases flammable gases which may ignite spontaneously.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P222	Do not allow contact with air.
P223	Do not allow contact with water.
P231 + P232	Handle under inert gas. Protect from moisture.
P235 + P410	Keep cool. Protect from sunlight.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P402 + P404	Store in a dry place. Store in a closed container.
P407	Maintain air gap between stacks/ pallets.
P413	Store bulk masses greater than .? kg/ .? lbs at temperatures not exceeding .? °C/ .? °F.
P420	Store away from other materials.
P422	Store contents under inert gas.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Zn
Molecular weight	:	65.39 g/mol
CAS-No.	:	7440-66-6
EC-No.	:	231-175-3
Index-No.	:	030-001-00-1

Hazardous components

Component	Classification	Concentration
Zinc powder (pyrophoric)		
	Pyr. Sol. 1; Self-heat. 1; Water-react. 1; Aquatic Acute 1; Aquatic Chronic 1; H250, H251, H260, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
Zinc/zinc oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Protective gloves against thermal risks

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 420 °C (788 °F) - lit.
f)	Initial boiling point and boiling range	907 °C (1665 °F) - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available

i)	Flammability (solid, gas)	May form combustible dust concentrations in air.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	1 hPa at 487 °C (909 °F)
l)	Vapour density	No data available
m)	Relative density	7.133 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5
p)	Auto-ignition temperature	The substance or mixture is classified as self heating with the category 1., The substance or mixture is pyrophoric with the category 1.
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
Strong acids and oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Zinc/zinc oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data availableZinc powder (pyrophoric)
Inhalation: No data available(Zinc powder (pyrophoric))
Dermal: No data available(Zinc powder (pyrophoric))
No data available(Zinc powder (pyrophoric))

Skin corrosion/irritation
No data available(Zinc powder (pyrophoric))

Serious eye damage/eye irritation
No data available(Zinc powder (pyrophoric))

Respiratory or skin sensitisation
Did not cause sensitisation on laboratory animals.(Zinc powder (pyrophoric))

Germ cell mutagenicity

No data available(Zinc powder (pyrophoric))

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Zinc powder (pyrophoric))

No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - single exposure
No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Zinc powder (pyrophoric))

Additional Information
RTECS: ZG8600000

chills, dry throat, sweet taste, Fever, Cough, Nausea, Vomiting, Weakness(Zinc powder (pyrophoric))
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Zinc powder (pyrophoric))

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Cyprinus carpio (Carp) - 450.0 µg/l - 96.0 h(Zinc powder (pyrophoric))
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 0.068 mg/l - 48 h(Zinc powder (pyrophoric))
	mortality NOEC - Daphnia (water flea) - 0.101 - 0.14 mg/l - 7 d(Zinc powder (pyrophoric))

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Algae - 7 d at 16 °C - 5 µg/l(Zinc powder (pyrophoric))
	Bioconcentration factor (BCF): 466

12.4 Mobility in soil
No data available(Zinc powder (pyrophoric))

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1436 Class: 4.3 (4.2) Packing group: II
Proper shipping name: Zinc powder
Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1436 Class: 4.3 (4.2) Packing group: II EMS-No: F-G, S-O
Proper shipping name: ZINC POWDER
Marine pollutant : yes

IATA

UN number: 1436 Class: 4.3 (4.2) Packing group: II
Proper shipping name: Zinc powder

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

SARA 311/312 Hazards

Reactivity Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H250	Catches fire spontaneously if exposed to air.
H251	Self-heating: may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	0
Fire Hazard:	3
Reactivity Hazard:	1
Special hazard.I:	W

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 05/28/2017 Print Date: 06/28/2019

Appendix E:

Quality Assurance Project Plan

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

Quality Assurance Project Plan
For

28-34 Pearl Street Site
28-34 Pearl Street
Port Chester, New York
NYSDEC BCP Site # C360214

Prepared for:

28 Pearl Street Development LLC
c/o Six Acre Capital

SESI Project No:
12123A

Date:
June 2025

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LIST OF ACRONYMS

Acronym	Definition
AAS	Absorption Spectroscopy
ASP	Analytical Service Protocol
BCP	Brownfield Cleanup Program
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
GC/MS	Gas Chromatography/Mass Spectrometry
HAS	Hollow-stem Auger
HDPE	High-Density Polyethylene
LDPE	Low-density Polyethylene
LFPS	Low Flow Purging Sampling
MDL	Method Detection Limit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	Polychlorinated Biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PPE	Personal Protective Equipment
PTFE	Polytetrafluoroethylene
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RIWP	Remedial Investigation Work Plan
SESI	SESI Consulting Engineers, Inc.
TIC	Tentatively Identified Compound
TCL	Target Compound List
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency

1.0 PROJECT DESCRIPTION

This document presents the Quality Assurance Project Plan (QAPP) for the Remedial Action Work Plan (RAWP) for the 28-34 Pearl Street Site (BCP No. C360214) ("Site") property, located at 28-34 Pearl Street Site, Village of Port Chester, Westchester County, New York. The Site consists of two (2) contiguous parcels totaling 0.45 acres of land identified on the Westchester County Assessors map as tax lots 142.30-1.84 (28 Pearl Street) and 142.30-1.83 (34 Pearl Street). The Site is currently vacant with no structures present.

The Site is bounded to the north by a mixed-use building with first floor retail and upper floors of commercial offices, to the east by Pearl Street followed by an asphalt parking lot, to the south by an asphalt parking lot, and to the west by residences. The nearest surface water is approximately 1,500 feet to the East (Byram River). Regional surface topography slopes downward to the east/northeast direction. According to the United States Geological Survey topographic map, the Site's average topographic elevation is approximately 57 feet above mean sea level (msl).

SESI Consulting Engineers (SESI) prepared the Remedial Action Work Plan for the 28-34 Pearl Street Site, New York, dated June 2025, which describes the remedial activities to be conducted at the Site, as part of the Site's planned remediation.

The remedial actions selected for the Site include the following:

- Installation of a support of excavation system to stabilize the Site soils prior to excavation,
- Excavation of all Site soils exceeding the USCOs, therefore achieving Track 1 for soil for the entire Site,
- Application of an oxygen reducing compound (ORC) powder in select areas to improve groundwater conditions following source removal (soil excavation),
- Installation of the elements of a sub-slab depressurization system (SSDS) under the subgrade garage of the proposed building. A vapor intrusion evaluation (VIE) will be conducted post-COC to determine if the soil vapor (SV) levels constitute a vapor intrusion (VI) risk. If the VIE determines that vapor mitigation is needed

per the NYSDOH matrices, then the elements of the SSDS will be turned into an Engineering Control (EC) as an active SSDS.

2.0 PROJECT ORGANIZATION

The RAWP activities will be conducted by SESI and their qualified subcontractors, on behalf of 28 Pearl Street Development LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below **(Table 2.1)** along with the names of subcontractors. Resumes of the project management team are included in **Attachment A.**

Table 2.1—SESI Personnel and Subcontractors

Role	Name	Telephone No.
Project Principal	Fuad Dahan, P.E., PhD	973-808-9050 x249
Project Manager (PM)	James Vander Vliet, P.E.	973-808-9050 x304
Principal Engineer	Fuad Dahan, P.E., PhD	973-808-9050 x249
Remedial Investigation Work Plan Project Manager	James Vander Vliet, P.E.	973-808-9050 x304
Field Team Leader	TBD	
Quality Assurance Officer	Joseph Scardino	973-808-9050 x267
Field Personnel	TBD	
Analytical Laboratory	TBD	
Data Validator	TBD	
Driller	TBD	

2.1. PROJECT PRINCIPAL

Provides technical and administrative oversight and guidance throughout the project, assist in securing company resources, participate in technical review of deliverables, and attend key meetings as needed.

2.2. PRINCIPAL ENGINEER

Provides technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3. PROJECT MANAGER

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to Brownfield Cleanup Program (BCP) requirements and client expectations.

2.4. REMEDIAL INVESTIGATION WORK PLAN PROJECT MANAGER

Responsible for coordinating and directing field efforts of SESI staff and subcontractors, and for maintaining that work is done according to QAPP specifications.

2.5. FIELD TEAM LEADER

Responsible for overseeing field work during the implementation of the RIWP, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media.

2.6. QUALITY ASSURANCE OFFICER

Responsible for reviewing sampling procedures and certify that the data was collected and analyzed using the appropriate procedures.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

In cases where NYSDOH ELAP Certification exists for a specific group or category of parameters, the laboratory performing analysis in connection with this project will have appropriate New York State Department of Health (NYSDOH) ELAP Certification. Analytical Service Protocol (ASP, June 2000) Category B deliverables are required for all samples. All data will be sent to a third party for validation in accordance with NYSDEC BCP requirements.

Detection limits set by New York State Department of Environmental Conservation (NYSDEC) ASP will be used for all sample analyses unless otherwise noted. If NYSDEC-ASP-dictated detection limits prove insufficient to assess project goals (i.e., comparison to drinking water standards or attainment of Applicable or Relevant and Appropriate Requirements [ARARs]), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control (QA/QC) objectives for all measurement data include completeness, representativeness, comparability, precision, and accuracy.

3.1. COMPLETENESS

The analyses performed must be appropriate and inclusive. The parameters selected for analysis are chosen to meet the objectives of the study.

Completeness of the analyses will be assessed by comparing the number of parameters intended to be analyzed with the number of parameters successfully determined and validated. Data must meet QC acceptance criteria for 100 percent or more of requested determinations.

3.2. REPRESENTATIVENESS

Samples must be taken of the population and, where appropriate, the population will be characterized statistically to express the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process, or environmental condition.

Non-dedicated sampling devices will be cleaned between sampling points by washing and rinsing with pesticide-grade methanol, followed by a thorough rinse with distilled water. Specific cleaning techniques are described in the Field Sampling Procedure. Two types of blank samples will accompany each sample set where Target Compound List (TCL) volatiles are to be analyzed (water matrix only). A trip blank, consisting of a 40 ml VOA vial of organic-free water prepared by the laboratory, will accompany each set of sample bottles from the laboratory to the field and back. This bottle will remain sealed throughout the shipment and sampling process. This blank will be analyzed for TCL volatile organic compounds (VOCs) along with the groundwater samples to ensure that contamination with TCL volatile compounds has not occurred during the bottle preparation, shipment and sampling phase of the project. In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL volatile organic compounds. The TCL compounds are identified in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program dated 10/2016 or as periodically updated.

The analysis results obtained from the determination of identical parameters in field duplicate samples can be used to further assess the representativeness of the sample data.

3.3. COMPARABILITY

Consistency in the acquisition, preparation, handling and analysis of samples is necessary in order for the results to be compared where appropriate. Additionally, the results obtained from analyses of the samples will be compared with the results obtained in previous studies, if available.

To ensure the comparability of analytical results with those obtained in previous or future testing, all samples will be analyzed by NYSDEC-approved methods. The NYSDEC-ASP mandated holding times for various analyses will be strictly adhered to.

3.4. PRECISION AND ACCURACY

The validity of the data produced will be assessed for precision and accuracy. Analytical methods which will be used include gas chromatography/mass spectrometry (GC/MS),

gas chromatography, colorimetry, atomic spectroscopy, gravimetric and titrametric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain analytical quality control. All data evaluations will be consistent with NYSDEC-ASP procedures (June 2000). Data will be 100 percent compliant with NYSDEC-ASP requirements. Matrix spike and matrix spike duplicates will be collected to confirm accuracy and precision at a rate of one (1) per 20 soil and/or groundwater samples taken.

The number of duplicate, spiked and blank samples analyzed will be a minimum of one (1) duplicate for every 20 samples per each medium of groundwater and soil. The inclusion and frequency of analysis of field blanks will be on the order of one (1) per every 20 samples (soil). For the aqueous matrix field blanks will be collected at a frequency of one (1) per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks (water matrix) or field blanks (soil). An equipment blank for Per- and polyfluoroalkyl substances (PFAS) will be collected once per day per matrix, regardless of whether equipment being used is disposable, at a frequency of one (1) per 20 samples taken for both soil and groundwater.

Quality assurance audit samples will be prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte to be expected for the analysis of QA samples and spiked samples is dependent upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit is also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses is generally accepted to be five (5) times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples will be expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS will be compared to the guidelines for recovery of individual compounds as established by the United States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.
The quality of results obtained for inorganic ion and demand parameters will be assessed by comparison of QC data with laboratory control charts for each test.

4.0 SAMPLING PROCEDURES

4.1. SAMPLING PROGRAM

The sampling program for this project will include soil, groundwater and soil vapor. Soil samples will be collected in the field from open excavations. Groundwater samples will be collected from groundwater monitoring wells using low flow purging techniques. A description of this method is shown on **Table 4.1**. Soil vapor samples will be collected from vapor points screened in the vadose zone using Summa Canisters. A summary of the sample containers, bottle types, preservatives and holding times is shown on **Table 4.2.** The sampling to be conducted for this project is shown on **Table 4.3.**

4.1.1. DRILLING/SAMPLING PROCEDURES

Soil samples will be collected from open excavations. Soil samples will be collected and analyzed in accordance with the NYSDEC-approved Work Plan. Monitoring wells for groundwater sample collection will be installed following remediation of soil. If the previously installed monitoring well network is damaged, then a new monitoring well network will be installed at the Site. Either hollow stem auger (HSA) or direct push drilling methods may be utilized for monitoring well completion.

Soil samples shall be collected from the bottom of the excavation. Upon retrieval of the sampling material, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters.

A geologist or engineer will be on Site during any sampling activities to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

4.1.2. MONITORING WELL COMPLETION

Monitoring wells will be constructed of 0.010-inch slot size PVC well screen and riser casing. Other materials utilized for completion will be washed silica sand (Q-Rock No. 4 or approved equivalent) bentonite grout, Portland cement, and a protective steel locking

well casing and cap with locks. The depth of the wells will be determined based on the depth to water, type of contaminant and field conditions encountered.

The monitoring well installation method for wells installed within unconsolidated sediments shall be to place the screen and riser assembly into the casing once the screen interval has been selected. At that time, a washed silica sand pack will be placed around the well screen if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2 to 3 feet above the top of the screen. Bentonite pellets will then be added to the annulus between the casing and the inside auger to insure proper sealing. Cement/bentonite grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or vertical flow above the screened interval. During placement of sand and bentonite pellets, frequent measurements will be made to check the height of the sand pack and thickness of bentonite layers by a weighted drop tape measure.

A bolt-down protective curb box will be installed, flush with the ground, or steel “stick-up” protective casing and secured by a Portland cement seal. The cement seal shall extend laterally at least 1 foot in all directions from the protective casing and shall slope gently away to drain water away from the well.

4.1.3. WELL DEVELOPMENT

All monitoring wells will be developed or cleared of all fine-grained materials and sediments that have settled in or around the well during installation so that the screen is transmitting representative portions of the groundwater. The development will be by one (1) of two (2) methods, pumping or bailing groundwater from the well until it yields relatively sediment-free water.

A decontaminated pump or bailer will be used and subsequently decontaminated after each use following procedures outlined in the Decontamination Protocol. Pumping or bailing will cease when the turbidity falls below 50 NTUs or until specific conductivity, pH, and temperature are stable (i.e., consecutive readings are within 10 percent with no overall

upward or downward trends in measurements). Well development water will be disposed of on the ground surface at each well location.

4.1.4. DECONTAMINATION

All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches and any other equipment or tools that have come in contact with contaminated materials will be decontaminated before any drilling on Site begins, between each well, and prior to removing any equipment from the Site. The preferred decontamination procedure will be to scrape the equipment from any residual soils and then rinse with water and Alconox®. Every effort will be made to minimize the generation of contaminated water. Any contaminated water generated will be drummed. The contaminated water drums will be disposed of at an appropriate facility after approval and sampling in accordance with the specific facility requirements.

4.1.5. PFAS SAMPLING CONSIDERATIONS

This section contains the materials limitations for Per- and polyfluoroalkyl substances sampling in accordance with the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoralkyl Substances (April 2023).

The groundwater samples will be analyzed for PFAS using Modified USEPA Method 1633. Reporting limits for PFOA and PFOS will not exceed 2 nanograms per liter (ng/L). Category B deliverables and an electronic data deliverable will be completed.

PFAS are very persistent in the environment and in the human body. Due to their presence in a variety of products, persistence in the environment and very low drinking water standards, care must be used when groundwater sampling for PFAS to avoid cross contamination from the sampling equipment and personal protective equipment (PPE).

No fabric softener will be used on clothing to be worn in field. Cosmetics, moisturizers, hand cream, unauthorized sunscreen, insect repellent or other related products will not be used the morning of sampling. The field samplers will wear powder-free nitrile gloves while filling and sealing the sample bottles. The sampling equipment components and sample

containers will not come in contact with material that may potentially contain PFAS such as aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials will be avoided. Food and drink packaging materials will be avoided, as well.

Sampling will be performed using certified PFAS-free sampling materials such as stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate or polypropylene pump and tubing. Rinse water must be laboratory-provided certified PFAS-free distilled or de-ionized water. Standard two step decontamination using Alconox® detergent and clean certified PFAS-free water rinse will be performed for equipment that does come in contact with PFAS materials.

No waterproof field books, plastic clipboards, binders, or spiral hard cover will be used for PFAS containers. No adhesives (i.e. Post-It® Notes), sharpies, or permanent markers will be used for PFAS containers. The PFAS containers will be labeled with ballpoint pens. PFAS samples will be stored in separate cooler filled with regular ice only with no chemical (blue) ice packs.

Pre-cleaned sample bottles with closures, coolers, sample labels and a chain of custody form will be provided by the laboratory.

4.2. GROUNDWATER SAMPLING PROGRAM

4.2.1. WELL EVACUATION

Prior to sampling a monitoring well, the static water level will be recorded. All well data will be recorded on a field sampling record. The wells will be sampled in accordance with the USEPA guidelines for the Low Flow Purging Sampling (LFPS). The purpose of LFPS is to collect groundwater samples from monitoring wells that are representative of ambient groundwater conditions in the aquifer. The LFPS method reduces turbidity which is needed particularly when sampling for metals.

4.2.2. SAMPLING PROCEDURE

The wells will be sampled using the USEPA LFPS technique. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown should not exceed 0.3 feet. The pump intake is lowered to the mid-point of the water column or as subsurface features such as bedrock fractures or more permeable zones warrant. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five (5) minutes during low flow purging using a flow through cell. When three (3) consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing. Low-flow sampling procedures are summarized on **Table 4.1.**

4.3. SOIL VAPOR SAMPLING

Soil vapor sampling will be conducted in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State (October 2006). Soil vapor samples will be collected in the vadose zone from shallow (five [5] feet) vapor points. Each vapor point will be installed in a shallow boring drilled either by hand-operated equipment (e.g. hand auger or percussion hammer drill), or by a small truck-mounted drill rig. Drilling equipment used shall be based on soil conditions, and the method that provides the most practical approach.

Each vapor point will consist of an inert sampling tube (polyethylene, stainless steel, or Teflon®) with a six (6)-inch screened section at the bottom through which soil vapors can be sampled. The screen slot size will be 0.0075 inches. A sampling zone will be created around the screened section by backfilling with one (1) to two (2) feet of porous coarse sand or glass beads, and at least three (3) feet of bentonite will be placed above the porous sampling zone to form a seal from the surface. Native clean soil will be packed around the remaining annulus to the ground surface.

The regulator will be set to collect a soil vapor sample at a flow rate of less than 0.2 liters per minute. After the summa canister is filled, the valve will be closed.

Each canister will be listed according to a specific sample I.D. on a chain of custody form. Sample canisters will be delivered to the laboratory within 24 hours and analyzed for VOCs by method TO-15. The detection limit for VOCs will be 1 µg/m3 or less.

The soil vapor sampling effort will include the use of inert helium tracer gas to verify that the soil vapor samples are not diluted by ambient air. The atmosphere around the sampling tube will be enriched with the tracer gas, and the soil vapor sample will be collected in the presence of the enriched tracer atmosphere. This will be accomplished by placing an inverted plastic pail over the sampling point and filling the pail with the tracer gas via a small tube penetrating the site of the pail. Refer to NYSDOH Guidance for Evaluating Indoor Air Intrusion in New York State (October 2006).

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.4. SAMPLE PRESERVATION AND SHIPMENT

Since all bottles will contain the necessary preservatives as shown in **Table 4.2**, they need only be filled. The 40 ml VOA vials must be filled brim full with no air bubbles. The other bottles should be filled to within about one (1) inch from the top.

The bottles will be sent from the laboratory in coolers which will be organized on a per site basis. Following sample collection, the bottles should be placed on ice in the shipping cooler. The samples will be cooled to 4°C, but not frozen.

Final packing and shipment of coolers will be performed in accordance with guidelines outlined in the ASP.

5.0 SAMPLE CUSTODY

The program for sample custody and sample transfer is in compliance with the NYSDEC-ASP, as periodically updated. If samples may be needed for legal purposes, chain-of-custody procedures, as defined by NEIC Policies and Procedures (USEPA-330/9-78-001-R, Revised June 1988) will be used. Sample chain-of-custody is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

5.1. FIELD SAMPLE CUSTODY

A chain-of-custody record accompanies the samples from initial sample container selection and preparation at the laboratory, shipment to the field for sample containment and preservation, and return to the laboratory. Two (2) copies of this record follow the samples to the laboratory. The laboratory maintains one (1) file copy and the completed original is returned to the site inspection team. Individual sample containers provided by the laboratory are used for shipping samples. The shipping containers are insulated and ice is used to maintain samples at approximately 4°C until samples are returned and in the custody of the laboratory. All sample bottles within each shipping container are individually labeled and controlled. Samples are to be shipped to the laboratory within 24 to 48 hours of the day of collection depending on parameter holding times.

Each sample shipping container is assigned a unique identification number by the laboratory. This number is recorded on the chain-of-custody record and is marked with indelible ink on the outside of the shipping container. The field sampler will indicate the sample designation/location number in the space provided on the appropriate chain-of-custody form for each sample collected. The shipping container is closed and a seal provided by the laboratory is affixed to the latch. This seal must be broken to open the container, and this indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the site investigation team leader and the sample will not be analyzed if tampering is apparent.

5.2. LABORATORY SAMPLE CUSTODY

The site investigation team leader or Project Quality Assurance Officer notifies the laboratory of upcoming field sampling activities and the subsequent transfer of samples to

the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample program meets the following criteria:

- The laboratory has designated a sample custodian who is responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the chain-of-custody record and records the date and time received.
- Care is exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the site investigation team leader as part of the corrective action process. A qualitative assessment of each sample container is performed to note any anomalies, such as broken or leaking bottles.

This assessment is recorded as part of the incoming chain-of-custody procedure:

1. The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
2. A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.
3. A copy of the chain-of-custody form will accompany the laboratory report and will become a permanent part of the project records.

5.3. FINAL EVIDENCE FILES

Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area.

A sample or an evidence file is under custody if:

- It is in your possession; it is in your view, after being in your possession.
- It was in your possession and you placed it in a secure area.
- It is in a designated secure area.

6.0 CALIBRATION PROCEDURES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the appropriate manufacturer's specifications or project specific requirements. The procedures for instrument calibration, calibration verification, and the frequency of calibrations are described in the ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate CLP standard operating procedures.

Calibration of other instruments required for measurements associated with these analyses will be in accordance with the manufacturer's recommendations and the standard operating procedures of the laboratory.

7.0 ANALYTICAL PROCEDURES

Analytical procedures shall conform to the most recent revision of the NYSDEC-ASP (June 2005) and are summarized on **Table 7.1.** In the absence of USEPA or NYSDEC guidelines, appropriate procedures shall be submitted for approval by NYSDEC prior to use.

The procedures for the sample preparation and analysis for organic compounds are as specified in the NYSDEC-ASP. Analytical cleanups are mandatory where matrix interferences are noted. No sample shall be diluted any more than a factor of five. The sample shall be either re-extracted, re-sonicated, re-stream distilled, etc. or be subjected to any one analytical cleanup noted in SW846 or a combination thereof. The analytical laboratory shall expend such effort and discretion to demonstrate good laboratory practice and demonstrate an attempt to best achieve the method detection limit.

7.1. VOLATILE ORGANICS

For the analysis of water samples for Target Compound List VOCs, no sample preparation is required. The analytical procedure for volatiles is detailed in NYSDEC-ASP (Volume I, Section D-I). A measured portion of the sample is placed in the purge and trap apparatus and the sample analysis is performed by gas chromatography/mass spectrometry for the first round. USEPA Method 8260 will be used, plus tentatively identified compounds (TICs). USEPA Methods 8010 or 8020 (gas chromatography with different detectors) will be used if subsequent rounds with lower limits of detection are warranted.

7.2. SEMI-VOLATILE ORGANIC COMPUNDS

The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TCL semi-volatile organic compounds are described in NYSDEC-ASP Volume I, Section D-III. USEPA Method 8270 will be used, plus TICs.

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3. PESTICIDE AND PCB COMPOUNDS

The sample preservation procedures for gas chromatography for pesticides and polychlorinated biphenyls (PCBs) will be as described in the NYSDEC-ASP methods (Section D-IV). The analysis of standard mixes, blanks and spiked samples will be performed at the prescribed frequency with adherence to the 72-hour requirement described in the method.

7.4. METALS

Water, soil and waste samples will be analyzed for the metals listed in Table 7.1. The detection limits for these metals are as specified in the NYSDEC-ASP, Section D-V. The instrument detection limits will be determined using calibration standards and procedures specified in the NYSDEC-ASP. The detection limits for individual samples may be higher due to the sample matrix. The procedures for these analyses will be as described in the NYSDEC-ASP.

The analyses for metals will be performed by atomic absorption spectroscopy (AAS) or inductively-coupled plasma emission spectroscopy (ICPES), as specified in the ASP with regard to AAS flame analysis.

7.5. PER- AND POLYFLUOROALKYL SUBSTANCES

The NYSDEC has developed a list of 21 PFAS Analytes List on Table 7.1 for remedial programs. These are:

- Perfluorobutanesulfonic acid
- Perfluorohexanesulfonic acid
- Perfluoroheptanesulfonic acid
- Perfluorooctanesulfonic acid
- Perfluorodecanesulfonic acid
- Perfluorobutanoic acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid

- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluorotridecanoic acid
- Perfluorotetradecanoic acid
- 6:2 Fluorotelomer sulfonate
- 8:2 Fluorotelomer sulfonate
- Perfluroroctanesulfonamide
- N-methyl perfluorooctanesulfonamidoacetic acid
- N-ethyl perfluorooctanesulfonamidoacetic acid

Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. Per the NYSDEC June 2019 memo on emergent contaminant sampling, the analytical procedure for soil and groundwater sampling of PFAS is Modified EPA Method 1633. The reporting limit for PFAS in soil samples is 0.5 ug/kg. Reporting limits for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in groundwater should not exceed 2 ng/L.

The laboratory standard operating procedures are included in **Attachment B**. The laboratory method detection limits (MDLs) for PFAS compounds are included in **Attachment C**.

7.6. SITE SPECIFICITY OF ANALYSES

Work plans prepared for remedial actions for sites contain recommendations for the chemical parameters to be determined for each site. Thus, some or all of the referenced methods will apply to the analysis of samples collected at the individual waste sites. Analyses of TCL analytes will be performed on all samples.

To ensure that the field sampling and laboratory analytical practices are acceptable, the data associated with the samples will be validated by a third party (in accordance with requirements of DER-10). The validation approach and results will be presented in a data usability summary report (DUSR) to be included in the Report.

TABLES

TABLE 4.1--SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STESS (LOW-FLOW) METHODS

Step	Description	Details
1	Record initial static water level.	**Device:** electric contact probe accurate to the nearest 0.1 foot.
2	Lower sampling device into well. Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well.	Pump intake must be no less than 2 feet from the bottom of the well to prevent disturbance and resuspension of sediments which may be at the bottom of the well.
3	Measure water level again: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.	
4	Purge Well	Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing.
5	Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.	

Step	Description	Details
6	Monitor Indicator Parameters	1. During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996): a. 0.1 for pH b. 3% for specific conductance (conductivity) c. 10 mv for redox potential d. 10% for DO and turbidity
7	The pump must not be removed from the well between purging and sampling.	Dissolved oxygen and turbidity usually require the longest time to achieve stabilization.
8	Collect Samples	Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.
9	Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate	If pH adjustment is necessary for VOC sample preservation,

Step	Description	Details
	EPA Program Guidance should be consulted to determine whether pH adjustment is necessary.	the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Groundwater purged from the well prior to sampling can be used for this purpose.
10	Remove Pump and Tubing	After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.
11	Measure and record well depth.	
12	Close and lock the well.	
13	Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.	
14	All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.	Dedicated line is disposed of or left at well site.
15	Equipment/wash blanks are collected when non-dedicated sampling equipment is used.	
16	Chain-of-custody forms are completed in triplicate.	The original and one carbon copy are put into a zip-lock bag and placed into the cooler. The original will be returned following sample analysis.

Step	Description	Details
		A second carbon copy is kept on file.
17	Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.	

TABLE 4.2--SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE[1]	HOLDING TIME
Aqueous Samples				
VOCs – USEPA 8260C	3	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2 Ice to 4°C	14 days
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270 SIM	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
Pesticides – USEPA 8081B	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
Metals[2]	1	1-liter, plastic bottle	Nitric acid to pH <2 NaOH for cyanide Ice to 4°C	180 days Cyanide: 14 days Mercury: 28 days
Cyanide – USEPA 9010C/9012B	1	1-liter, plastic	Sodium Hydroxide to pH >12 Ice to 4°C	14 days
PFAS Compounds – USEPA Modified Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	None	14 days
Soil, Sediment, Solid Waste Samples:				
VOCs – USEPA 8260C	3	5-gram EnCore samplers	Chilled to 0 - 6°C	14 days
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270D SIM if RL cannot be reached	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction, 40 days extracted)

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME
Pesticides – USEPA 8081B	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	None
Metals(3)	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	180 days Cyanide: 14 days Mercury: 28 days
PFAS Compounds – USEPA Modified Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	None	28 days
Soil Vapor / Indoor Air Samples:				
VOCs – USEPA TO-15	1	Summa Canister	None	30 days

(1) All samples will be preserved with ice during collection and shipment.

(2) Metals refers to the 24 metals and cyanide in the Target Compound List (NYSDEC-CLP 11/87). Metals will be analyzed by Method 6020B, 7470A for mercury, and 9010C/9012B for cyanide

(3) Metals refers to the 24 metals and cyanide in the Target Compound List (NYSDEC-CLP 11/87). Metals will be analyzed by Method 6010D, 7471B for mercury, and 9010C/9012B for cyanide

(4) A complete list of compounds is provided on Table 7.1.

Table 4.3--Sampling Overview

Matrix	Samples Collected	Field and Trip Blanks	Matrix Spike Matrix Spike Duplicates (number and type)	Duplicate Samples (number and type)
Groundwater	Three (3) samples collected from three (3) monitoring wells for each round of groundwater sampling.	1 per 20 samples or 1 per day	1 per 20 samples	1 duplicate for every 20 samples
Soil	Approx. 23 subsurface samples	1 per 20 samples or 1 per day	1 per 20 samples	1 duplicate for every 20 samples
Soil Vapor*	Five (5) subgrade soil vapor samples and one (1) outdoor ambient air samples	N/A	N/A	N/A

***** If soil vapor samples are to be collected 1 ambient air sample will be taken per 20 samples

TABLE 7.1–CONTRACT-REQUIRED QUANTITATION LEVELS AND ANALYTICAL METHODS FOR ASP INORGANICS, ASP VOLATILES, ASP SEMI-VOLATILES, ASP PESTICIDES, AND PCBS

Target Compound List (TCL) and Contract-Required Quantitation Limit

SECTION 1 - ASP INORGANICS Method: NYSDEC-ASP-91-4					
	PARAMETER	**CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)**		**PARAMETER**	**CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)**
1.	Aluminum	200	13.	Magnesium	5,000
2.	Antimony	60	14.	Manganese	15
3.	Arsenic	15	15.	Mercury	0.2
4.	Barium	200	16.	Nickel	40
5.	Beryllium	5	17.	Potassium	5,000
6.	Cadmium	5	18.	Selenium	35
7.	Calcium	5,000	19.	Silver	10
8.	Chromium	10	20.	Sodium	5,000
9.	Cobalt	50	21.	Thallium	25
10.	Copper	25	22.	Vanadium	50
11.	Iron	100	23.	Zinc	60
12.	Lead	10	24.	Cyanide	10

SECTION 2 – ASP ORGANICS (VOLATILES) Method: NYSDEC-ASP-91-1					
	VOLATILE	**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**		**VOLATILE**	**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**
1.	Chloromethane	5.0	18.	1,2-Dichloropropane	5.0
2.	Bromomethane	5.0	19.	cis-1,3-Dichloropropene	5.0
3.	Vinyl Chloride	5.0	20.	Trichloroethene	5.0
4.	Chloroethane	5.0	21.	Dibromochloromethane	5.0
5.	Methylene Chloride	5.0	22.	1,1,2-Trichloroethane	5.0
6.	Acetone	10.0	23.	Benzene	5.0
7.	Carbon Disulfide	5.0	24.	Trans-1.3-Dichloropropene	5.0

SECTION 2 – ASP ORGANICS (VOLATILES) Method: NYSDEC-ASP-91-1					
VOLATILE		**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**	**VOLATILE**		**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**
8.	1,1-Dichloroethylene	5.0	25.	Bromoform	5.0
9.	1,1-Dichloroethane	5.0	26.	2-Hexanone	10.0
10.	1,2-Dichloroethylene (total)	5.0	27.	4-Methyl, 1,2-Pentanone	10.0
11.	Chloroform	5.0	28.	Tetrachloroethylene	5.0
12.	1,2-Dichloroethane	5.0	29.	Toluene	5.0
13.	2-Butanone	10.0	30.	Chlorobenzene	5.0
14.	1,1,1-Trichloroethane	5.0	31.	Ethylbenzene	5.0
15.	Carbon Tetrachloride	5.0	32.	Styrene	5.0
16.	Bromodichloromethane	5.0	33.	Total Xylenes	5.0
17.	1,1,2,2-Tetrachloroethane	5.0			

SECTION 3 - ASP ORGANICS (SEMI-VOLATILES) Method: NYSDEC-ASP-91-2					
SEMI-VOLATILE		CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)	SEMI-VOLATILE		CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)
1.	Phenol	5.0	33.	Acenaphthene	5.0
2.	Bis(2-chloroethyl)ether	5.0	34.	2,4-Dinitrophenol	10.0
3.	2-Chlorophenol	5.0	35.	4-Nitrophenol	10.0
4.	1,3-Dichlorobenzene	5.0	36.	Dibenzofuran	5.0
5.	1,4-Dichlorobenzene	5.0	37.	Dinitrotoluene	5.0
6.	1,2-Dichlorobenzene	5.0	38.	Diethylphthalate	5.0
7.	2-Methylphenol	5.0	39.	4-Chlorophenyl phenyl ether	5.0
8.	2,2'oxybis(1-Chloropropane)	5.0	40.	Fluorene	5.0
9.	4-Methylphenol	5.0	41.	4-Nitroanile	10.0
10.	N-Nitroso-dipropylamine	5.0	42.	4,6-Dinitro-2-methylphenol	10.0
11.	Hexachloroethane	5.0	43.	N-nitrosodiphenyl amine	5.0
12.	Nitrobenzene	5.0	44.	4-Bromophenyl phenyl ether	5.0
13.	Isophorone	5.0	45.	Hexachlorobenzene	5.0
14.	2-Nitrophenol	5.0	46.	Pentachlorophenol	10.0
15.	2,4-Dimethylphenol	5.0	47.	Phenanthrene	5.0
16.	Bis(2-Chloroethoxy) methane	5.0	48.	Anthracene	5.0
17.	2,4-Dichlorophenol	5.0	49.	Carbazole	5.0
18.	1,2,4-Trichlorobenzene	5.0	50.	Di-n-butyl phthalate	5.0
19.	Naphthalene	5.0	51.	Fluoranthene	5.0
20.	4-Chloroaniline	5.0	52.	Pyrene	5.0
21.	Hexachlorobutadiene	5.0	53.	Butyl benzyl phthalate	5.0
22.	4-Chloro-3-methylphenol	5.0	54.	3,3'-Dichloro benzidine	5.0
23.	2-Methylnaphthalene	5.0	55.	Benz(a)anthracene	5.0
24.	Hexachlorocyclopentadiene	5.0	56.	Chrysene	5.0
25.	2,4,6-Trichlorophenol	5.0	57.	Bis(2-ethylhexyl) phthalate	5.0
26.	2,4,5-Trichlorophenol	10.0	58.	Di-n-octyl phthalate	5.0

SECTION 3 - ASP ORGANICS (SEMI-VOLATILES) Method: NYSDEC-ASP-91-2					
	SEMI-VOLATILE	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**		**SEMI-VOLATILE**	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**
27.	2-Chloronapthalene	5.0	59.	Benzo(b)fluoranthene	5.0
28.	2-Nitroananiline	10.0	60.	Benzo(k)fluoranthene	5.0
29.	Dimethyl phthalate	5.0	61.	Benzo(a)pyrene	5.0
30.	Acenaphthylene	5.0	62.	Indeno(1,2,3-cd) pyrene	5.0
31.	2,6-Dinitrotoluene	5.0	63.	Dibenz(a,h) anthracene	5.0
32.	3-Nitroaniline	10.0	64.	Benzo(g,h,i)perylene	5.0

SECTION 3 - ASP ORGANICS (PESTICIDES/PCBS) Method: NYSDEC-ASP-91-3					
	PESTICIDE/PCB	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**		**PESTICIDE/PCB**	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**
1.	Alpha-BHC	0.05	15.	4,4'-DDT	0.10
2.	Beta-BHC	0.05	16.	Methoxychlor	0.5
3.	Delta-BHC	0.05	17.	Endrin ketone	0.10
4.	Gamma-BHC (lindane)	0.05	18.	Endrin aldehyde	0.10
5.	Heptachlor	0.05	19.	Alpha-Chlordane	0.05
6.	Aldrin	0.05	20.	Gamma-Chlordane	0.05
7.	Heptachlor epoxide	0.05	21.	Toxaphene	5.0
8.	Endosulfan I	0.05	22.	AROCHLOR-1016	1.0
9.	Dieldrin	0.10	23.	AROCHLOR-1221	1.0
10.	4,4'-DDE	0.10	24.	AROCHLOR-1232	1.0
11.	Endrin	0.10	25.	AROCHLOR-1242	1.0
12.	Endosulfan II	0.10	26.	AROCHLOR-1248	1.0
13.	4,4'-DDD	0.10	27.	AROCHLOR-1254	1.0
14.	Endosulfan sulfate	0.10	28.	AROCHLOR-1260	1.0

*Matrix: groundwater. For soil matrix, multiply CRDL by 100.

**Quantitation limit for medium-level soil is 1,200 µg/kg (wet weight basis).

Method: EPA Modified 1633 Perfluorinated Alkyl Acids by Isotope Dilution			
		Reporting Limit— Groundwater (ng/l)	**Method Detection Limit— Groundwater (ng/l)**
1	Perfluorobutanoic Acid (PFBA)	2.00	0.408
2	Perfluoropentanoic Acid (PFPeA)	2.00	0.396
3	Perfluorobutanesulfonic Acid (PFBS)	2.00	0.238
4	Perfluorohexanoic Acid (PFHxA)	2.00	0.328
5	Perfluoroheptanoic Acid (PFHpA)	2.00	0.225

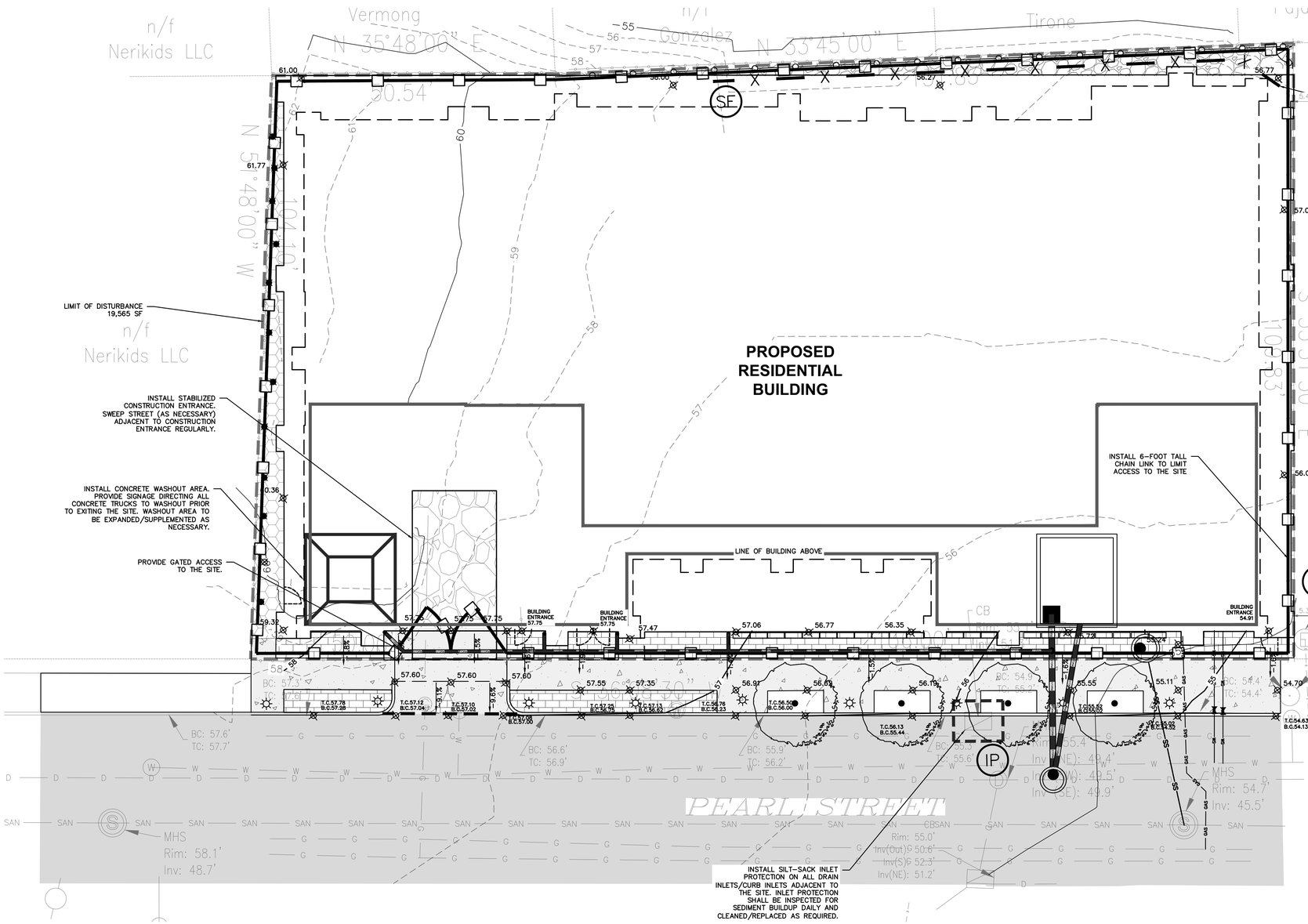
Method: EPA Modified 1633 Perfluorinated Alkyl Acids by Isotope Dilution			
6	Perfluorohexanesulfonic Acid (PFHxS)	2.00	0.376
7	Perfluorooctanoic Acid (PFOA)	2.00	0.236
8	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2 FTS)	2.00	1.33
9	Perfluoroheptanesulfonic Acid (PFHpS)	2.00	0.688
10	Perfluorononanoic Acid (PFNA)	2.00	0.312
11	Perfluorooctanesulfonic Acid (PFOS)	2.00	0.504
12	Perfluorodecanoic Acid (PFDA)	2.00	0.304
13	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	2.00	1.21
14	N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2.00	0.648
15	Perfluoroundecanoic Acid (PFUnA)	2.00	0.260
16	Perfluorodecanesulfonic Acid (PFDS)	2.00	0.980
17	Perfluorooctanesulfonamide (FOSA)	2.00	0.580
18	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2.00	0.804
19	Perfluorododecanoic Acid (PFDoA)	2.00	0.372
20	Perfluorotridecanoic Acid (PFTrDA)	2.00	0.327
21	Perfluorotetradecanoic Acid (PFTA)	2.00	0.248

Method: EPA Modified 1633 Perfluorinated Alkyl Acids by Isotope Dilution		
	Reporting Limit— Soil (ng/g)	**Method Detection Limit— Soil (ng/g)**
Perfluorobutanoic Acid (PFBA)	0.500	0.023
Perfluoropentanoic Acid (PFPeA)	0.500	0.046
Perfluorobutanesulfonic Acid (PFBS)	0.250	0.039
Perfluorohexanoic Acid (PFHxA)	0.500	0.053
Perfluoroheptanoic Acid (PFHpA)	0.250	0.045
Perfluorohexanesulfonic Acid (PFHxS)	0.250	0.061
Perfluorooctanoic Acid (PFOA)	0.250	0.042
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2 FTS)	0.500	0.180
Perfluoroheptanesulfonic Acid (PFHpS)	0.500	0.137

Method: EPA Modified 1633 Perfluorinated Alkyl Acids by Isotope Dilution		
Perfluorononanoic Acid (PFNA)	0.250	0.075
Perfluorooctanesulfonic Acid (PFOS)	0.250	0.130
Perfluorodecanoic Acid (PFDA)	0.250	0.067
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	0.500	0.287
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	0.500	0.202
Perfluoroundecanoic Acid (PFUnA)	0.500	0.047
Perfluorodecanesulfonic Acid (PFDS)	0.500	0.153
Perfluorooctanesulfonamide (FOSA)	0.500	0.098
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.500	0.085
Perfluorododecanoic Acid (PFDoA)	0.500	0.070
Perfluorotridecanoic Acid (PFTrDA)	0.500	0.205
Perfluorotetradecanoic Acid (PFTA)	0.500	0.054

Appendix F:

Soil Erosion and Sediment Control Plan



LEGEND

- PROPERTY LINE
- PROPOSED CONCRETE CURB
- PROPOSED CONCRETE SIDEWALK
- PROPOSED GRAVEL SURFACE
- PROPOSED DECORATIVE PAVERS
- PROPOSED RIVERSTONE
- PROPOSED STREET LIGHTING
- PROPOSED BOLLARD
- PROPOSED 6-FOOT FENCE
- PROPOSED CONTOUR — 10
- PROPOSED SPOT GRADE +10.20
- PROPOSED STORM PIPE
- PROPOSED WATER SERVICE — WS —
- PROPOSED SANITARY SEWER SERVICE — SS —
- TEMPORARY INLET PROTECTION (IP)
- TEMPORARY SILT FENCE — X — X — (SF)
- TEMPORARY CONSTRUCTION FENCE (CF)
- STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED LIMIT OF DISTURBANCE

INSTALLATION & MAINTENANCE OF EROSION CONTROL:

CONSTRUCTION SCHEDULE
NOTIFY APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 5 DAYS PRIOR TO START.

EROSION CONTROL MEASURES
INSTALL ALL EROSION CONTROL MEASURES PRIOR TO START OF CONSTRUCTION. CALL FOR INSPECTION FROM THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 2 DAYS PRIOR TO FINISH.

INSPECTION BY MUNICIPALITY
MAINTENANCE (TO BE PERFORMED DURING ALL PHASES OF CONSTRUCTION)

AFTER ANY RAIN CAUSING RUNOFF, CONTRACTOR TO INSPECT HAYBALES, ETC. AND REMOVE ANY EXCESSIVE SEDIMENT AND INSPECT STOCKPILES AND CORRECT ANY PROBLEMS WITH SEED ESTABLISHMENT.
INSPECTIONS SHALL BE DOCUMENTED IN WRITING AND SUBMITTED TO THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION.

INSPECTION BY MUNICIPALITY – FINAL GRADING
REMOVE UNNEEDED SUBGRADE FROM SITE.
CALL FOR INSPECTION FROM THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 2 DAYS PRIOR TO FINISH.

INSPECTION BY MUNICIPALITY – LANDSCAPING

SPREAD TOPSOIL EVENLY OVER AREAS TO BE SEEDED. HAND RAKE LEVEL. BROADCAST 1.25 LB. BAG OF JONATHAN GREEN "FASTGROW" MIX OR EQUAL OVER AREA TO BE SEEDED. APPLY STRAW MULCH AND WATER WITHIN 2 DAYS OF COMPLETION OF TOPSOILING. CALL FOR INSPECTION FROM THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 2 DAYS PRIOR TO FINISH.

INSPECTION BY MUNICIPALITY – FINAL LANDSCAPING

GRASS ESTABLISHED.
CALL FOR INSPECTION FROM THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 2 DAYS PRIOR TO FINISH.

INSPECTION BY MUNICIPALITY – FINAL INSPECTION

ALL EROSION CONTROL MEASURES REMOVED AND GRASS ESTABLISHED.
CALL FOR INSPECTION FROM THE APPROPRIATE MUNICIPAL AGENCY HAVING JURISDICTION AT LEAST 2 DAYS PRIOR TO FINISH.

EXISTING INFORMATION SHOWN HEREON PROVIDED BY EDWARD T. GANNON, L.S., PLLC

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

No.	Description	Date
4.	100% CD - DOB SET	10-31-25
3.	PERMIT SET	08-13-25
2.	CD PROGRESS SET	07-15-25
1.	REVISED PER CONSULTANTS COMMENTS	06-03-22

THIS PLAN NOT VALID FOR CONSTRUCTION WITHOUT ENGINEERS SEAL & SIGNATURE

PROJECT:
PROPOSED RESIDENTIAL BUILDING
28 PEARL STREET
VILLAGE OF PORT CHESTER
WESTCHESTER COUNTY – NEW YORK

SEDIMENT & EROSION CONTROL PLAN

STATE OF NEW YORK · MICHAEL K. FISHER · LICENSED PROFESSIONAL ENGINEER · No. 80637

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Date: 05/02/22 Sheet: 2 of 5
Scale: 1" = 10'
Designed By: T.K.
Checked By: M.S.
Sheet No. C-2

ANY ALTERATIONS OR REVISIONS OF THESE PLANS, UNLESS DONE BY OR UNDER THE DIRECTION OF THE NYS LICENSED AND REGISTERED ENGINEER THAT PREPARED THEM, IS A VIOLATION OF THE NYS EDUCATION LAW.

Appendix G:

Community Air Monitoring Plan

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Environmental
Site Civil

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Community Air Monitoring Plan

For:

28-34 Pearl Street Site
28-34 Pearl Street
Port Chester, New York
NYSDEC BCP Site # C360214

Prepared for:

28 Pearl Street Development LLC

c/o Six Acre Capital

SESI Project No:
12123A

Date:
June 2025

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
mcg/m^3	micrograms per cubic meter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
PM-10	Less than 10 micrometers
ppm	Parts Per Million
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the remedial action at the proposed development at 28-34 Pearl Street Site (BCP No. C360214) (the "Site"). The Site consists of two (2) contiguous parcels totaling 0.45 acres of land identified on the Westchester County Assessors map as tax lots 142.30-1.84 (28 Pearl Street) and 142.30-1.83 (34 Pearl Street). The 28 Pearl Street portion of the Site was formerly improved with a 3,240-square-foot single-story building that was demolished between 2022 and 2023. The building was previously occupied by a small engine repair and an automobile repair shop. The 34 Pearl Street portion of the Site was formerly improved with a 1,774-square-foot two (2)-story single-family dwelling that was demolished between 2022 and 2023.

The Site is bounded to the north by a mixed-use building with first floor retail and upper floors of commercial offices, to the east by Pearl Street followed by an asphalt parking lot, to the south by an asphalt parking lot, and to the west by residences. The nearest surface water is approximately 1,500 feet to the East (Byram River).

2.0 OBJECTIVES

The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone.

3.0 METHODS

The CAMP will include continuous monitoring for particulate matter (e.g. airborne “dust”) and volatile organic compounds (VOCs) during the planned remedial investigation, demolition, and construction activities. Any CAMP exceedances will be reported to the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) on the business day after site work takes place. Notification of the exceedance will be sent via email along with the reason for the exceedance, the measure(s) taken to address the exceedance, and if the exceedance was resolved.

TABLE 3.1 NYSDEC AND NYSDOH CONTACT INFORMATION

Name	Contact Information
Michael Squire NYSDEC	michael.squire@dec.ny.gov
Christopher Budd NYSDOH	christopher.budd@health.ny.gov

3.1. CONTINUOUS MONITORING

Continuous monitoring for particulates and VOCs will be conducted during all ground intrusive activities including soil borings, monitoring well installations, soil excavation and loading, and demolition of the buildings.

3.2. PERIODIC MONITORING

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

4.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

VOCs must be monitored at the downwind perimeter of the immediate work area (i.e. the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a photoionization detector (PID) equipped with a 10.6 eV lamp. The equipment will be fresh air calibrated at least daily, and as specified by the manufacturer for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.
- All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

5.0 PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust-suppression techniques must be employed. Work may continue with dust-suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust-suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust-suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

6.0 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FEET OF POTENTIALLY EXPOSED INDIVIDUAL STRUCTURES

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed one (1) ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Attachment 1A:

NYSDOH Generic CAMP

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Attachment 1B:

Fugitive Dust and Particulate Monitoring

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

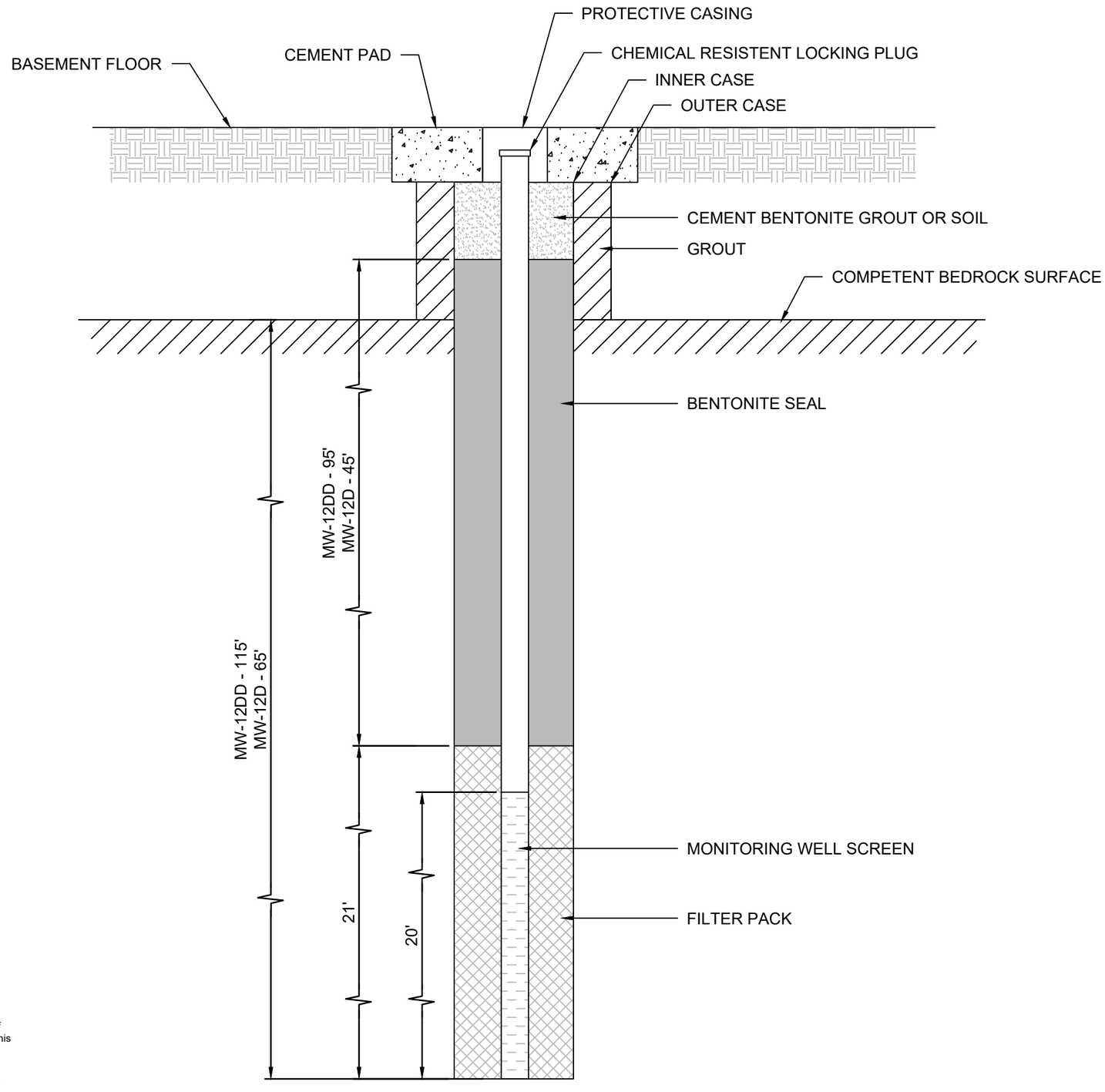
(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix H:

Typical Well Construction Diagram



NYS Education Law
Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

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dwg by: KBV
chk by: MKC
scale: N.T.S.
date: 07/02/2025

project:
REMEDIAL ACTION WORK PLAN
28-34 PEARL STREET
PORT CHESTER, NEW YORK 10573

title:
PROPOSED MONITORING WELL SCHEMATIC

job no: 12123A
drawing no:
G

N:\ACAD\12123\CAD\RAW\13542.DWG.WELL SCHEMATIC.DWG 07/02/25 01:34:05PM, kim.vanderklein, LAYOUT:PROP BEDROCK WELL