# **REMEDIAL ACTION WORKPLAN**

# **Brownfield Cleanup Program**

13-12 Beach Channel Drive 13-12, 13-16, and 13-24 Beach Channel Drive Far Rockaway, New York New York City Tax Map Designation: *Block 15528; Lots 5, 6, and 9* 

NYSDEC BCP Site Number: C241254

# **Prepared for:**

BCD Owner LLC 419 Park Avenue South, 4th Floor New York, New York

#### Submitted to:

New York State Department of Environmental Conservation Region 2, Division of Environmental Remediation 47-40 21st Street Long Island City, NY 11101

April 2022

**IEC Project Number: 15209** 



# NYSDEC BCP #C241254 – Draft Remedial Action Work Plan 13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

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BCD Owner LLC NYSDEC BCP #C241254 – Draft Remedial Action Work Plan 13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

**CERTIFICATION** 

I, Xin Yuan, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and that this Remedial Action Work Plan 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).

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

096444

**NYS Professional Engineer#** 

Date

415/2022

Signature

It is a violation of Article 145 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 145, New York State Education Law.

# BCD Owner LLC NYSDEC BCP #C241254 – Draft Remedial Action Work Plan 13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

# **ACRONYMS AND ABBREVIATIONS**

| AMSL   | Above Mean Sea Level                                    | OER   | Office of Environmental Remediation              |
|--------|---|-------|--|
| AST    | Aboveground Storage Tank                                | ORP   | Oxidation-Reduction Potential                    |
| ASTM   | American Society for Testing and Materials              | PPM   | Parts Per Million                                |
| AOC    | Area of Concern   | РРВ   | Parts Per Billion                                |
| ASP    | Analytical Services Protocol                            | РСВ   | Poly Chlorinated Biphenyl's                      |
| ВСР    | Brownfield Cleanup Program                              | PAH   | Poly Aromatic Hydrocarbons                       |
| BGS    | Below Grade Surface                                     | PCE   | Tetrachloroethene                                |
| BTEX   | Benzene Toluene Ethylbenzene and Xylenes                | PGW   | Protection of Groundwater                        |
| BER    | Business Environmental Risk                             | PID   | Photo Ionization Detector                        |
| СРР    | Citizen Participation Plan                              | PFAS  | Per- and Polyfluoroalkyl Substances              |
| СО     | Certificate of Occupancy                                | PVC   | Polyvinyl Chloride                               |
| CSM    | Conceptual Site Model                                   | QAQC  | Quality Assurance Quality Control                |
| cVOC   | Chlorinated Volatile Organic Compound                   | QAPP  | Quality Assurance Project Plan                   |
| CREC   | Controlled Recognized Environmental Condition           | RIWP  | Remedial Investigation Work Plan                 |
| CEQR   | City Environmental Quality Review                       | RCRA  | Resource Conservation and Recovery Act           |
| CAMP   | Community Air Monitoring Program                        | REC   | Recognized Environmental Condition               |
| CLP    | Contract Laboratory Program                             | RAO   | Remedial Action Alternative                      |
| DER    | Division of Environmental Remediation                   | RAWP  | Remedial Action Work Plan                        |
| DOB    | Department of Buildings                                 | RIR   | Remedial Investigation Report                    |
| DNAPL  | Dense Non-Aqueous Phase Liquid                          | SF    | Square Feet                                      |
| DUSR   | Data Usability Summary Report                           | SHWS  | State Hazardous Waste Site                       |
| DO     | Dissolved Oxygen  | svoc  | Semi-Volatile Organic Compound                   |
| EDR    | Environmental Data Resources                            | sco   | Soil Cleanup Objective                           |
| EIS    | Environmental Impact Statement                          | SSDS  | Sub-Slab Depressurization System                 |
| ELAP   | Environmental Laboratory Accreditation Program          | TAGM  | Technical and Administrative Guidance Memorandum |
| ESA    | Environmental Site Assessment                           | TCE   | Trichloroethylene                                |
| FWRIA  | Fish and Wildlife Risk Impact Analysis                  | TCL   | Target Compound List                             |
| FBG    | Feet Below Grade  | TIC   | Tentatively Identified Compound                  |
| AWQS   | Ambient Water Quality Standard                          | TAL   | Target Analyte List                              |
| GPR    | Ground Penetrating Radar                                | USGS  | United States Geological Survey                  |
| GPS    | Global Positioning System                               | USFWS | United states Fish and Wildlife Service          |
| HREC   | Historical Recognized Environmental Condition           | μg/kg | Micrograms Per Kilogram                          |
| HASP   | Health and Safety Plan                                  | μg/m³ | Micrograms Per Cubic Meter                       |
| LLC    | Limited Liability Corporation                           | USCS  | Unified Soil Classification System               |
| MW     | Monitoring Well   | UST   | Underground Storage Tank                         |
| MS     | Matrix Spike  | USEPA | United States Environmental Protection Agency    |
| MSD    | Matrix Spike Duplicate                                  | VCP   | Voluntary Cleanup Program                        |
| NYSDEC | New York State Department of Environmental Conservation | voc   | Volatile Organic Compound                        |
| NYC    | New York City   |       |  |
| NYCDEP | New York City Department of Environmental<br>Protection |       |  |
| NYSDOH | New York State Department of Health                     |       |  |
| NYCRR  | New York Codes Rules and Regulations                    |       |  |
| NAPL   |   | 1     |  |
|        | Non-Aqueous Phase Liquid                                |       |  |

### 1 INTRODUCTION

Impact Environmental Engineering and Geology PLLC (Impact) on behalf of BDC Owner LLC ("Volunteer"), has prepared this On-Site Remedial Action Work Plan (RAWP) for the approximately 0.76 acre property located at 13-12, 13-16 and 13-24 Beach Channel Drive, within the Far Rockaway section of Queens County, New York ("Site"). The Site is in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as BCP Site No. C241254. The Site is currently unoccupied.

BCD Owner LLC applied to the NYSDEC BCP in April 2021, as a Volunteer, and was accepted into the program as a Volunteer on June 28, 2021. The Brownfield Cleanup Agreement (BCA) was fully executed on July 14, 2021, and Site No. C241254 was assigned to the Site.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during previous investigations and the Remedial Investigation (RI), performed between October 2020 and October 2021. The RAWP provides an evaluation of a Track 1 cleanup and other applicable remedial action alternatives, their associated costs, and the recommended and preferred remedy.

This RAWP describes and evaluates the remedy to ensure it will be protective of human health and the environment by achieving the Remedial Action Objectives (RAOs) identified for the Site. The proposed Track 2 remedy, which will achieve 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives (RR SCOs), will consist of:

- Remedial design
- Excavation
- End-point Confirmation Sampling
- Groundwater Treatment
- Vapor Mitigation (Sub-slab depressurization system [SSDS])
- Soil vapor extraction (SVE)
- Environmental Easement
- Site Management Plan

The preferred remedy is protective of public health and the environment, provides long term effectiveness and permanence by reducing toxicity, mobility, and volume of contamination, provides protective guidance for Site workers, and can be readily implemented. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance.

#### 1.1 Site Description

The Site consists of three (3) contiguous tax parcels encompassing approximately 32,263 square-feet (0.76-acres) in size which is located about 0.76 miles west of the Nassau Expressway, NY Route 878, and situated on the east side of Beach Channel Drive and the west side of Redfern Avenue. The Site consists of three (3) parcels of land assigned New York City Tax Map Designation: Block 15528, and Lots 5, 6, and 9 (these lots are proposed to be merged into a single Lot in the future, after which the BCA will be amended) and is in an area composed of commercial and residential development along collector and local roadways, respectively, within a historically commercial and residential area. Refer to **Plate 1** for a site location map and **Appendix A** for a site survey. The Site has three (3) NYC Zoning designations: R6 for residential uses; DFR (special Downtown Far Rockaway District) for mixed-uses; and C2-4 for commercial uses.

Currently, the Site is unoccupied and contains three (3) vacant structures. The building located on the south side of the site, Lot 5, is an approximately 1,400 square foot slab-on-grade structure, with one-story plus a mezzanine that was most recently occupied by a Kentucky Fried Chicken. The remainder of the 10,500 square foot Lot 5 is comprised of an asphalt paved parking lot. The building located in the center of the Site, Lot 6, is an approximately 1,800 square-foot 3-story commercial and residential structure with a partial basement at a depth of approximately 4-feet below grade, that was most recently occupied by various retail establishments and residential apartment units. The remainder of the 11,095 square foot Lot 6 is comprised of concrete paved parking areas. Finally, the building located on the north of the Site, Lot 9, is an approximately 3,600 square foot slab on grade structure, with a single story, that was most recently occupied by a car wash and auto detailing establishment. The remainder of the 11,500 square foot Lot 9 iscomprised of asphalt and concrete paved parking areas (see Plate 2 for Existing Site Map). The building currently receives electrical service from PSEG, Natural Gas from National Grid, potable water from NYCDEP, while sanitary waste is reportedly handled by the NYCDEP sanitary sewer. Storm water runoff for the Site is handled via drywells located throughout the property.

#### 1.2 Proposed Redevelopment

The development project consists of a new mixed-use residential and community facility building. The proposed development will be approximately 132,000 gross square feet (GSF) and 86.5 feet in height (8 stories) and include the co-location of a 40,000 SF homeless shelter and 85,000-SF supportive housing residence. Upon completion, the mixed-use facility will include a 200-bed homeless shelter and 147 affordable studio and one- and two-bedroom residential units. The building will be constructed slab on grade, with final excavation depth ranging from 4-feet below grade surface (bgs) beneath the building slab, and 6-feet bgs in areas of footings. The building materials and design will assure the structure is contextual with other buildings in the neighborhood and with the mixed-use character of the street. The water table is expected at between approximately 13 and 19-feet bgs and is not expected to impact the development. Development is slated to take 27 months to complete. Refer to Plate 3 and Appendix

**B** for the Site development plans.

#### 1.3 Surrounding Properties

The area surrounding the Site consists of a mix of urban residential and commercial properties. The list below provides details on surrounding property usage adjacent to the Site:

North: Several retail stores including Karen Hair Design, Roberts Delight restaurant, Amanah Deli &

Grocery, and Little Caesar Pizza and a row of multi-family residential dwellings,

<u>East:</u> Redfern Avenue and residential construction project.

South: Several retail stores including Crown Fried Chicken, Sammy M Deli & Grocery, New Butterflies

Chinese restaurant, Urban Home Sports Wear, Express shoe repair, George and Chris Cleaners, Money Gram, Alex Magic Electronics, Jamaica Breeze Buffet restaurant and Fish store, and Mott

Avenue.

West: Beach Channel Drive and several commercial properties (Taco Bell, Klean and Kleaner

Laundromat, and Shop Fair grocery store).

There are six (6) known schools located within a ½-mile radius of the Site, including the 'Challenge Preparatory Middle Charter' school located approximately 608-feet east of the Site, 'Talmud Torah Siach Yitzchok' school located approximately 756-feet east of the Site, the 'Church of God Christianity' school located approximately 1,218-feet northeast of the Site, 'P.S. Q256' school located approximately 1,449 feet northeast of the Site, 'Success Academy Charter School' located approximately 1,236 feet southeast of the Site, and the 'Wave Preparatory Elementary School' located approximately 2,267 feet south-southwest of the Site.

There are eight (8) known Day care facilities located within ½-mile of the Site: 'World Harvest Deliverance Center' located approximately 706-feet east of the Site, 'Little Friends GAN LLC' located approximately 1,868-feet to the east of the Site, 'P.S. 253' pre-school located approximately 1,447 feet northeast of the Site, 'Island Child Development Services' located approximately 1,312 feet southeast of the Site, 'Peninsula Preparatory Academy Charter School' located approximately 1,564 feet south of the Site, 'Rockaway Child Care Center' located approximately 1,349 feet north of the Site, 'Rockaway CCC' daycare center located approximately 1,584 feet north of the Site, and 'Bethel Emanuel Temple, Inc.' located approximately 1,700 feet north of the Site.

There are seven (7) known hospitals located within a ½-mile radius of the Site, 'Psychiatric Day Treatment Clinic' located approximately 371-feet east of the Site, 'Far Rockaway Treatment Center' located approximately 527 feet east of the Site, 'Joseph P. Addabbo Family Health Center' located approximately 1,577 feet northeast of the Site, 'Rockaway Dialysis' located approximately 1,719 feet south of the Site, 'Community Mental Health Center' located approximately 1,840 feet south of the Site, 'St. John's Episcopal Hospital Ambulatory Care Center' located

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approximately 2,015 feet south of the Site, and 'St. John's Episcopal Hospital South Shore' located approximately 2,424 feet south of the Site.

The Site is located approximately 1,500-feet south of the Negro Bar Channel and approximately 1,100-feet west from 'IS 53 Playground'. There are no known wetlands in the vicinity of the subject Site.

## 2 DESCRIPTION OF REMEDIAL INVESTIGATIVE FINDINGS

The previous environmental subsurface investigations completed at the Site have provided documentation of impacts to vadose zone soil, soil vapor and groundwater at select areas. The objective of the RI was to delineate the extent of contamination in soil, groundwater, and soil vapor such that a qualitative human health exposure assessment can be developed and a remedial action work plan can be designed for the Site.

## 2.1 Remedial Investigation Summary

The RI scope of work began in July 2018 with the identification of soil and groundwater contamination during a Phase II Site Investigation conducted by Tenen Environmental, LLC and continued to November 2021 with the RIs conducted by Impact. These investigations consisted of the advancement of soil borings, soil vapor points, and groundwater monitoring wells and pilot testing to evaluate remedial actions. Metals, semi-volatile organic compounds (SVOC) and tetrachloroethene (PCE) contamination were found and delineated and soil vapor extraction pilot testing was conducted to determine best possible remedial actions and designs. This data has been evaluated to determine the remedial actions for the Site that is consistent with redevelopment plans. A brief summation of the investigations leading up to the RAWP is as follows:

#### Singer Environmental Group, LTD (SEG) Phase I ESA, November 7, 2018

The Property (13-12 Beach Channel Drive – Lot 5) is approximately 10,500 square feet in area and is developed with a 1-story commercial building occupied by a KFC restaurant. SEG concluded the following information based on results of the Phase I ESA:

- According to Environmental Data Resources (EDR), a dry cleaner is listed at 21-40 Mott Avenue from 1975 through 2014. According to EDR, this site is listed at a lower elevation than the subject property.
- A commercial building with a sign stating "Cleaners" is located to the east of the subject property.
   According to EDR, a dry cleaner is listed at 20-88 Mott Avenue from 1986 through 2014. This site is located across the street from the subject property.
- The subject property is an "E" Designated site with the NYC Department of Planning for Hazmat and Noise.
- Due to the fact that the site has an E-Designation for Hazardous Materials, in accordance with OER's
   (Office of Environmental Remediation) requirements, prior to obtaining a building permit for
   redevelopment of the Site, the following must be performed: 1) preparation of a Phase II
   InvestigationWork Plan, 2) implementation of an OER-approved Phase II Investigation, 3) preparation
   of a Phase II Investigation/Remedial Investigation report, and 4) preparation of an OER approved
   Remedial Action Work Plan.
- While the Noise E-Designation of the site is not considered a recognized environmental condition, in accordance with OER's requirements, prior to obtaining a building permit for redevelopment of the Site, a Noise Remedial Work Plan must be prepared and approved by OER.

Singer Environmental Group, LTD (SEG) review of Environmental Business Consultants (EBC) Phase I ESA, September 18, 2018

SEG concluded the following information based on a review of the EBC Phase I ESA:

- The Property (13-16 Beach Channel Drive Lot 6) is identified by the street address of 13-16 Beach Channel Drive and as Borough 4- Block 15528-Lot No. 6. The site was a portion of a larger residential property and developed with a small shed (center) from at least 1895. Between 1924 and 1933, the shed was demolished, and the property developed with the existing 3-story building, utilized as a residence, with a small, detached garage adjacent to the east. The garage was demolished in the late-1950's and the building partially converted for commercial use, with an animal hospital present by at least 1962. The animal hospital vacated the building circa 1990, with the building occupied by multiple commercial/retail and residential tenants since that time. The property is currently developed with a 3-story mixed use (commercial/residential) building, with a basement. The building is occupied by World Outreach Evangelical Ministry (basement) and six residential apartments.
- While no physical evidence of a current underground storage tank (UST) was identified at the site, one
  ARA/LAA job is listed for the site for the installation of a new boiler and conversion from oil to gas. SEG
  recommended that clarification be made to identify the current heating system of the building, and an
  opinion be rendered on the former oil tank at the property.

Singer Environmental Group, LTD (SEG) review of Tenen Environmental (Tenen) Phase I ESA, September 21, 2018 SEG concluded the following information based on a review of the EBC Phase I ESA:

- The Site (13-24 [Lot 9] to 13-30 Beach Channel Drive), Tax Block 15528, Lots 9, 12, and 112, is an irregularly shaped parcel on the east side of Beach Channel Drive. The total Site area is approximately 17,235 square feet (SF). The Site is currently developed with one-story commercial buildings, and occupied by a car wash, salon, barber, deli, and fast-food restaurant. Note, only Lot 9 is part of the proposed RIWP. Lot 9 is currently occupied by a car wash and has historically been identified by Sanborn maps as an "autolaundry." An existing subgrade oil-water separator is located on the south side of the building.
- The Site was listed on the EDR proprietary E-DESIGNATION database with E-designation E-232 for Air
  Quality HVAC fuel limited to natural gas, Window Wall Attenuation and Alternate Ventilation, and
  Hazardous Materials Phase I and Phase II Testing Protocol.
- Due to the fact that the site has an E-Designation for Hazardous Materials, in accordance with OER's
   (Office of Environmental Remediation) requirements, prior to obtaining a building permit for
   redevelopment of the Site, the following must be performed: 1) preparation of a Phase II
   InvestigationWork Plan, 2) implementation of an OER-approved Phase II Investigation, 3) preparation

of a Phase II Investigation/Remedial Investigation report, and 4) preparation of an OER approved Remedial Action Work Plan.

 While the Noise and Air E-Designation of the site is not considered a recognized environmental condition, in accordance with OER's requirements, prior to obtaining a building permit for redevelopment of the Site, a Noise and Air Remedial Work Plan must be prepared and approved by OER.

#### Tenen Environmental, LLC Due Diligence Phase II Environmental Site Investigation (ESI), August 2, 2018

Tenen conducted a Phase II ESI on Lots 6, 9, 12, and 112 on July 23 and 24 2018. As part of the investigation one (1) soil boring (SB-1) and one (1) temporary groundwater monitoring well (TW-1) were installed on Lot 6, and one (1) soil boring (SB-2) and one (1) temporary groundwater monitoring well (TW-2) were installed on Lot 9. Category B Deliverables were not obtained for the samples collected by Tenen. Additionally, the portions of the investigation conducted on Lots 12 and 112 are not relevant to this RAWP. Tenen concluded the following information based on results of the Phase II ESI:

- Fill material, containing sand, gravel, cobbles, brick, coal, and glass fragments, was encountered between one and three feet below grade (ft-bg) at the borings SB-1 and SB-2. The fill material was underlain by fine to coarse tan sand with some silt. Groundwater was encountered at approximately 17 ft-bg. The regional groundwater flow direction was estimated to be to the northwest.
- The collected soil samples were analyzed for VOCs, SVOCs, and metals, while groundwater samples were analyzed for VOCs and SVOCs.
- No VOCs or SVOCs were detected in soil samples (collected from 0-2 fbg) at concentrations above applicable NYCRR Part 375 Protection of Groundwater (PGW) or Restricted Residential (RR) Soil Cleanup Objectives (SCOs). Of note, the VOC Tetrachloroethylene (PCE) was detected in SB-1 (0-2') but at concentrations below applicable PGW and RR SCOs.
- The following compounds were detected in soil samples collected at the Site in exceedance of regulatory standards:

|          | Results                 | (mg/kg) | Standards (mg/kg) |         |  |
|----------|-------------------------|---------|-------------------|---------|--|
| Compound | SB-1 (0-2') SB-2 (0-2') |         | PGW SCOs          | RR SCOs |  |
| Lead     | 166                     | 74.7    | 63                | 400     |  |
| Mercury  | 0.669                   | -       | 0.18              | 0.81    |  |
| Zinc     | 376                     | 205     | 109               | 10,000  |  |

Note: Samples not included in the table did not display regulatory exceedances

<sup>- =</sup> no regulatory exceedance

 The following compounds were detected in groundwater samples collected at the Site in exceedance of NYSDEC Ambient Water Quality Standards (AWQS):

|                    | Result | ts (ug/L) | Standards (ug/L) |
|--------------------|--------|-----------|------------------|
| Compound TW-1      |        | TW-2      | NY AWQS          |
| PCE                | 16     | -         | 5                |
| Benzo(a)anthracene | 0.03   | -         | 0.002            |

Note: Samples not included in the table did not display regulatory exceedances

Tenen concluded that the metals detected in shallow soil samples could be attributed to "historic fill",
while the PCE in groundwater sample TW-1 was likely attributed to "upgradient surrounding property usage."

#### Impact Environmental Closures (IEC) Partial Remedial Investigation (RI), October/November 2020

IEC performed a Partial RI in October/November 2020, in accordance with an New York City Office of Environmental Remediation (NYCOER) approved Remedial Investigation Work Plan. The purpose of the Partial RI was to provide a baseline for soil, groundwater, and soil vapor conditions on the site, with a plan to complete the remainder of the Remedial Investigation based on the results and conditions of the Partial RI. See **Plates 4**, **5** and **6** for previous sample locations and regulatory exceedance results maps. The following is a summary of the Partial RI:

- Prior to any sub-surface investigation work, a public 811 Markout was called. In addition, a private geophysical survey was performed using ground penetrating radar (GPR) and line locating tools, in order to pre-clear the proposed sample locations, and to determine the presence of any sub-grade utilities or obstructions/anomalies. No such obstructions or anomalies were detected in the locations scanned.
- Six (6) soil probes (designated SB-1 through SB-6) were installed by IEC with a Geoprobe. The soil probes were installed to determine the soil conditions across the site and were installed at depths representative of the excavation depths of the proposed redevelopment. Each soil boring was installed to a terminal depth of 4-feet bgs, and samples were collected from two intervals: shallow interval from 0-2 feet bgs, and intermediate interval from 2-4-feet or 4-6-feet bgs.
  - o Soil boring SB-1 was installed in the southern corner of the property, on Lot 5.
  - o Soil boring SB-2 was installed in the eastern corner of the property, on Lot 9.
  - o Soil boring SB-3 was installed in the northern corner of the property, on Lot 9.
  - Soil boring SB-4 was installed in the southwestern corner of the property, on Lot 5.
  - Soil boring SB-5 was installed along the eastern boundary of the property, on Lot 6.
  - o Soil boring SB-6 was installed in the center of the property, on Lot 6.
- A total of 12 soil samples were submitted for laboratory analysis. Each soil sample was analyzed for NYCRR
   Part 375 List VOCs, SVOCs, metals, poly chlorinated biphenyl's (PCBs), and pesticides.

<sup>- =</sup> no regulatory exceedance

• The following compounds were detected in soil samples collected at the Site in exceedance of regulatory standards:

|          |             | Results   | Standards (mg/kg) |       |      |         |
|----------|-------------|---|-------------------|-------|------|---------|
| Compound | SB-1 (0-2') | SB-1 (0-2') SB-4 (0-2') SB-4 (2-4') SB-5 (0-2') |                   |       |      | RR SCOs |
| Lead     | 168         | 190   | 76.6              | 77.1  | 63   | 400     |
| Mercury  | 0.506       | -   | -                 | 0.235 | 0.18 | 0.81    |
| Zinc     | -           | 200   | -                 | -     | 109  | 10,000  |
| PCE      | 0.88        | -   | 3.2               | -     | 1.3  | 19      |

|                        |             | Results     | Standards (mg/kg) |             |          |         |
|------------------------|-------------|-------------|-------------------|-------------|----------|---------|
| Compound               | SB-1 (0-2') | SB-4 (0-2') | SB-4 (2-4')       | SB-5 (0-2') | PGW SCOs | RR SCOs |
| Benzo(a)anthracene     | -           | 6.8         | -                 | -           | 1        | 1       |
| Benzo(a)pyrene         | -           | 7           | -                 | -           | 1        | 1       |
| Benzo(b)fluoranthene   | -           | 8.8         | -                 | -           | 1        | 1       |
| Benzo(k)fluoranthene   | -           | 2.3         | -                 | -           | 0.8      | 3.9     |
| Chrysene               | -           | 6           | -                 | -           | 1        | 3.9     |
| Dibenzo(a,h)anthracene | -           | 0.92        | -                 | -           | 0.33     | 0.33    |
| Indeno(1,2,3 cd)pyrene | -           | 4.2         | -                 | -           | 0.5      | 0.5     |

Note: Samples not included in the table did not display regulatory exceedances

- During the investigation three (3) permanent and one (1) temporary groundwater monitoring wells
  designated MW-1, MW-2, MW-3, and TWP-1 were installed. Estimated groundwater depth was
  approximately17-feet bg. Each well was screened from between 15-25-feet bgs.
  - $\circ$   $\,$  MW-1 was installed in the southern corner of the property, on Lot 5.
  - o MW-2 was installed in the eastern corner of the property, on Lot 9.
  - o MW-3 was installed in the northern corner of the property, on Lot 9.
  - o TWP-1 was installed in the southwestern corner of the property, on Lot 5.
- A total of four (4) groundwater samples were submitted for laboratory analysis. Each groundwater sample was analyzed for NYCRR Part 375 List VOCs, SVOCs, metals, PCBs, and pesticides.
- The following compounds were detected in groundwater samples collected at the Site in exceedance of NYSDEC Ambient Water Quality Standards (AWQS):

<sup>- =</sup> no regulatory exceedance

|                       |       | Result               | Standards (ug/L) |      |         |
|-----------------------|-------|----------------------|------------------|------|---------|
| Compound              | MW-1  | MW-1 MW-2 MW-3 TWP-1 |                  |      | NY AWQS |
| Chloroform            | 18    | 15                   | -                | 9.2  | 7       |
| PCE                   | 62    | -                    | 240              | 52   | 5       |
| Manganese (dissolved) | 344.1 | -                    | -                | -    | 300     |
| Benzo(b)fluoranthene  | -     | -                    | -                | 0.03 | 0.002   |
| Benzo(k)fluoranthene  | ı     | -                    | -                | 0.01 | 0.002   |

Note: Samples not included in the table did not display regulatory exceedances

- As part of the Partial RI, each of the three (3) permanent groundwater monitoring wells were surveyed to
  determine the approximate groundwater flow direction. The elevations of the installed monitoring wells
  were surveyed relative to a permanent surface benchmark. The results of the survey indicate groundwater
  flow was towards the north-northwest.
- Finally, as part of the investigation, six (6) soil vapor probes (designated SV-1 through SV-6) were installed across the site to determine soil vapor conditions below the proposed building footprint. Soil vapor probes were installed between 3-5-feet below grade.
  - o SV-1 was installed on the southwestern corner of the property, on Lot 5.
  - o SV-2 was installed in the southeast corner of the property, on Lot 5.
  - o SV-3 was installed in the center of the property, on Lot 6.
  - SV-4 was installed in the northwestern corner of the property, on Lot 9.
  - o SV-5 was installed in the central north portion of the property, on Lot 9.
  - o SV-6 was installed in the northeastern corner of the property, on Lot 9.
- A total of six (6) soil vapor samples were submitted for laboratory analysis. Each soil vapor sample was analyzed for USEPA TO-15 List VOCs.
- The following compounds were detected in soil vapor samples collected at the Site in exceedance of regulatory standards:

|          | Results (ug/m3) |       |      |      |      |       |   |  |
|----------|-----------------|-------|------|------|------|-------|---|--|
| Compound | SV-1            | SV-2  | SV-3 | SV-4 | SV-5 | SV-6  | NYSDOH In-<br>door Air Guid-<br>ance Values |  |
| PCE      | 15,800          | 1,040 | 129  | 88.2 | 113  | 1,050 | 30  |  |
| TCE      | -               | 2.42  | -    | -    | -    | -     | 2   |  |

Note: Samples not included in the table did not display regulatory exceedances

Based on the results of the soil samples collected during the initial Partial RI, in particular the detected
presence of PCE at elevated concentrations at sample locations SB-1 and SB-4, on the south portion of the
property (Lot 5), supplemental confirmatory soil borings were installed at the locations of SB-1 and SB-4

<sup>- =</sup> no regulatory exceedance

<sup>- =</sup> no regulatory exceedance

- on November 6, 2020. The purpose of these soil borings was to confirm the presence of PCE at these locations, and to vertically delineate the contamination.
- As part of this supplemental sampling event, a representative bottom sample was also collected from an onsite drywell (DW-1), located on Lot 5.
- Each soil boring (designated SB-1A and SB-4A) was advanced down to a terminal depth of 10-feet bgs. Five (5) samples were collected from each soil boring at two-foot intervals (0-2', 2-4', 4-6', 6-8' and 8-10'). Initially, the 0-2' and 2-4' samples from each location were submitted for laboratory analysis for TCL VOCs. PCE was detected at elevated concentrations in SB-4A at 2-4', thus the SB-4A 4-6' sample was subsequently submitted for analysis to determine the if PCE contamination extended deeper.
- The following compounds were detected in the supplemental soil samples collected at the Site in exceedance of regulatory standards:

|          |                 |                  | Standards (mg/kg) |                  |                  |           |             |         |
|----------|-----------------|------------------|-------------------|------------------|------------------|-----------|-------------|---------|
| Compound | SB-1A<br>(0-2') | SB-1A (2-<br>4') | SB-4A (0-<br>2')  | SB-4A (2-<br>4') | SB-4A (4-<br>6') | Drywell-1 | PGW<br>SCOs | RR SCOs |
| PCE      | 0.049           | 0.00055          | 0.012             | 23               | 0.0021           | 0.019     | 1.3         | 19      |

Note: Samples not included in the table did not display regulatory exceedances

- It should be noted, that during the Partial RI, an active drycleaner was noted to abut the Site to the south, approximately 20-feet south of SB-1/SB-1A and 40-feet west of SB-4/SB-4A.
- Category B Deliverables were obtained for the sample analysis collected as part of this partial RI. A Data
  Usability Summary Report has been generated for this data and is included in the Remedial Investigation
  Report (RIR).

#### GEO Design Geotechnical Report, December 2020

A geotechnical report by GEO Design, performed in December 2020 advanced boreholes to a terminal depth of 100 fbg. Bedrock was not encountered during the investigation. The unconsolidated overburden soil was identified as urban fill materials in the top 2-3-feet of section, with native underlying fine to medium grained brown sands and silts. The geotechnical investigation detected a silt/clayey silt material from 33.5 fbg to 42 fbg, underlain by a confining clay layer from 48.5 fbg to 65 fbg. A lower sand unit was identified from 65 fbg to the terminal depth of 100 feet.

## Impact Environmental Closures (IEC) Final Remedial Investigation (RI), September /November 2021

IEC performed a Final RI in September/November 2021, under a NYSDEC-approved work plan) October/November 2020 Remedial Investigation Work Plan. The purpose of the Final RI was to delineate the contamination found in the previous RI and conduct pilot testing for extraction of soil vapors to evaluate and design an appropriate remediation for the Site (refer to **Plates 4**, **5** and **6** for sample locations, and analytical results maps. The following is a summary of the Final RI:

- Advancement of two (2) exploratory soil borings in sample locations where elevated PCE was detected to screen and accurately assess the silt/clayey silt material identified during the aforementioned geotechnical investigation. Continuous field screening, and collection for laboratory analysis of soils at the water table and in contact with each transitional or confining layer;
- Completion of eight (8) ten-foot step-out soil borings (four [4] surrounding each of the exploratory boreholes to both vertically and horizontally delineate the presence of PCE detected in prior soil samples SB-1 and SB-4, and the field screening and laboratory analysis as described below;
  - Shallow interval at 0-2 feet bgs
  - Intermediate interval at 6-8 feet bgs, or at the depth exhibiting evidence of contamination including odors, staining or highest PID reading. If no indication of contamination or PID measurement (>20 ppmV) are detected, a sample will be collected 1-foot above the groundwater table which is estimated at between 15 and 17 feet bgs.
  - Water table interval
  - Bottom of depth of contamination (if observed)
- Installation of six (6) soil borings across the Site in areas not previously investigated for the collection and analysis of three (3) depth intervals per boring, for field screening and laboratory analysis of up to 14 soil samples;
  - Shallow interval at 0-2 feet bgs
  - Shallow interval at 6-8 feet bgs, or at the depth of the highest PID reading
  - Interval, directly above the groundwater table, approximately 15-17 feet bgs.
- The following targeted compounds were detected in delineation soil samples in exceedance of regulatory standards:

|          | Results (mg/kg)                                     |     |     |     | Standard | s (mg/kg) |
|----------|---|-----|-----|-----|----------|-----------|
| Compound | SB-1N (0-2') SB-IE (0-2') SB-IE (6-8') SB-1S (0-2') |     |     |     | PGW SCOs | RR SCOs   |
| PCE      | 3.9   | 1.5 | 2.2 | 2.6 | 1.3      | 19        |

|          | Results (mg/k | g)           | Standards (mg/kg) |          |         |
|----------|---------------|--------------|-------------------|----------|---------|
| Compound | SB-4N (0-2')  | SB-4N (6-8') | SB-4W (6-8')      | PGW SCOs | RR SCOs |
| PCE      | 1.5           | 3.6          | 5.5               | 1.3      | 19      |

• The performance of a sub-slab depressurization pilot test was conducted to evaluate areal extent of influence (Radius of Influence or ROI) to design the remedial system and recoverability of soil vapor contaminants. The results indicated an asymmetrical ROI of greater than 28 feet to the northeast, north and northwest of the extraction well on Lot 6. The ROI was limited to the south by impediments to air flow or channeling. The effluent vapor stream concentrations indicated active remediation would be required with vapor treatment.

The following soil vapors were detected in the extraction well raw effluent vapor stream;

#### Pilot Test Effluent Results

| Extraction                              | Results (ug/m3) |      |                |                   |  |
|---|-----------------|------|----------------|-------------------|--|
| Well                                    | PCE             | TCE  | Cis-1,2<br>DCE | Vinyl<br>Chloride |  |
| SVE-1 Raw Influent<br>(Blower Effluent) | 956             | 8.43 | 0.86           | -                 |  |

- Four (4) single and four (4) nested permanent monitoring wells, for a total of 12 monitoring wells, were installation on the Site. The four (4) single wells were installed to 25 fbg and screened between 15-25 fbg. The four (4) nested wells consisted of two (2) wells screened within the upper water table zone and intermediate transitional zone, respectively. The shallow wells were installed to 32 fbg and screened between 30-32 fbg, while the intermediate wells were installed to 42 fbg and screened between 40-42 fbg. SVOCs and Metals previously detected at the Site were detected in nearly all of the groundwater samples in marginal exceedance of the NYSDEC Ambient Water Quality Standards (AWQS). The wells were located as follows:
  - MW4s/MW-4i: located in the center of the Site, directly down gradient from the active drycleaner.
  - MW-5: located along the central eastern boundary of the Site.
  - MW-6: located along the central northern boundary of the Site.
  - MW-7s/MW-7i: located on the south portion of the site, proximal to the active dry cleaner.
  - MW-8s/MW-8i: located on the south portion of the site, proximal to the active dry cleaner.
  - MW-9s/MW-9i: located in the southeast corner of the Site, presumed either cross- or downgradient of 20- 02 Mott Avenue (a former dry cleaning facility with documented impacts to groundwater).
  - MW-10: located in the location of former boring SB-4 and proposed exploratory SB-4B in the southwestportion of the Site.
  - MW-11: located along the western central boundary of the Site.
- The following cVOC compounds were detected in groundwater samples collected at the Site in exceedance of the AWQS:

|            |       | Result | Standards (ug/L) |       |         |
|------------|-------|--------|------------------|-------|---------|
| Compound   | MW-4I | MW-5   | MW-7I            | MW-10 | NY AWQS |
| Chloroform | 8.3   | 28     | 20               | 12    | 7       |
| PCE        | -     | -      | 16               | 92    | 5       |

Note: Samples not included in the table did not display regulatory exceedances  $\,$ 

<sup>- =</sup> no regulatory exceedance

The following SVOCs were detected in groundwater samples in exceedance of the AWQS:

| Compound               | Wells                        | Results (ug/L)  | NY AWQS |
|------------------------|------------------------------|-----------------|---------|
| Benzo(a)anthracene     | 4s,8s,9s,9i                  | 0.02 - 0.07 J   | 0.002   |
| Benzo(a)pyrene         | 9s,9i                        | 0.10 - 0.12     | 0.002   |
| Benzo(b)fluoranthene   | 4s,4i,5,7s,7i,8s,8i,9s,9i,10 | 0.02 J - 0.21 * | 0.002   |
| Benzo(k)fluoranthene   | 9s,9i                        | 0.01 – 0.07 J   | 0.002   |
| Chrysene               | 8s,9s,9i                     | 0.01 – 0.08 J   | 0.002   |
| Indeno(1,2,3-cd)pyrene | 7i,8i,9s,9i,10               | 0.01 J - 0.17   | 0.002   |

J = Laboratory estimated

The following metals were detected in groundwater samples in exceedance of the AWQS:

| Compound              | Wells                          | Results (ug/L)  | NY AWQS |
|-----------------------|--------------------------------|-----------------|---------|
| Iron (dissolved)      | 4s,7s,8s,8i,9s,9i              | 1140 - 7200     | 300     |
| Magnesium (dissolved) | 9s,9i                          | 48300 – 48700   | 35000   |
| Manganese (dissolved) | 4s,4i,7s,7i,8s,8i,9s,9i        | 373.8 – 2686    | 300     |
| Sodium (dissolved)    | 4s,4i,5,6,7s,7i,8s,8i,9s,9i,10 | 124000 – 525000 | 20000   |
| Chromium (total)      | 4s,5,7i,8i,9s,9i               | 58.78 – 196.9   | 50      |
| Arsenic (total)       | 9s                             | 27.02           | 25      |
| Iron (total)          | 4s,4i,5,6,7s,7i,8s,8i,9s,9i,10 | 348 - 47900     | 300     |
| Lead (total)          | 4s,4i                          | 57.69 – 128.4   | 25      |
| Manganese (total)     | 4s,4i,7s,7i,8s,8i,9s,9i        | 738 - 2566      | 300     |
| Sodium (total)        | 4s,4i,5,6,7s,7i,8s,8i,9s,9i,10 | 119000 - 496000 | 20000   |
| Thallium (total)      | 4s,8s,8i                       | 0.51 – 0.93 J   | 0.5     |

J = Laboratory estimated

- Installation of six (6) soil vapor points throughout the property was conducted for the collection of soil vapor samples to further define the extent of cVOCs across the Site and assess the potential for off-site migration in relation to downgradient receptors.
- The following cVOC compounds were detected in soil vapor samples collected at the Site in exceedance of the New York State Department of Health (NYSDOH) Indoor Air Guidance Values:

<sup>\* =</sup> Analyte was detected in the field blank

# Targeted Soil Vapors

|          | Results (ug/m3) |      |       |       | Standard(ug/m3)                      |
|----------|-----------------|------|-------|-------|--------------------------------------|
| Compound | SV-7            | SV-9 | SV-10 | SV-12 | NYSDOH Indoor<br>Air Guidance Values |
| PCE      | 271,000         | 260  | 1,000 | 239   | 30                                   |
| TCE      | 1,460           | -    | -     | -     | 2                                    |

Note: Samples not included in the table did not display regulatory exceedances

Based on the results of the Final RI, IEC concluded that remedial action was appropriate to support the proposed site development.

# 2.2 NYSDEC/NYSDOH Site Determination

The NYSDEC and NYSDOH have determined the Site poses a significant threat to human health and the environment. This decision is based the potential for off-site migration of contaminants in the groundwater; and the potential for human exposure to site-related contaminants via soil vapors. To address this threat, IEC has developed the proposed remedy summarized in this RAWP.

# 3 DESCRIPTION OF REMEDIAL ACTION PLAN

## 3.1 Remedial Action Objectives

The development of an appropriate remedial approach begins with defining the Site-specific Remedial Action Objectives (RAOs) to address substantial public health and environmental issues identified during the RI portion of this document. In developing the RAOs, consideration is given to the reasonably anticipated future use of the Property (i.e., residential and community facility) and the applicable SCGs. Based on the results of the RI, the following RAOs have been identified for this Site.

#### Soil RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

#### Soil RAOs for Environmental Protection

• Prevent migration of contaminants that would result in groundwater or surface water contamination.

#### Groundwater RAO 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.

#### **Groundwater RAOs for Environmental Protection**

• Remove the source of ground or surface water contamination.

#### Soil Vapor RAO for Public Health Protection

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

## 3.2 Evaluation of Remedial Alternatives

Remedial alternatives were evaluated and developed for the Site in terms of meeting the threshold and the balancing criteria. The NYSDEC DER-10 'Threshold Criteria' requires evaluation of items 1 and 2; while the 'Balancing Criteria' requires evaluation of items 3 through 9:

- 1. Protection of human health and the environment
- 2. Compliance with standards, criteria, and guidelines (SCGs)
- 3. Short-term effectiveness and impacts
- 4. Long-term effectiveness and permanence

13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

- 5. Reduction of toxicity, mobility, or volume of contaminated material
- 6. Implementability
- 7. Cost effectiveness
- 8. Community acceptance; and
- Land use

Remedial alternatives must be evaluated in terms of the protection of public health and the environment. The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property.

As required, a Track 1 Unrestricted Use cleanup scenario is evaluated to determine if it is appropriate for the Site remedial action and its intended use. A Track 2 Restricted Residential alternative was also evaluated for the Site. The evaluation compares the ability of an unrestricted use remedy and restricted use remedy to meet the Standards, Criteria and Guidance (SCGs) presented in Section 4.1.

The following is a detailed description of the two alternatives analyzed to address the contaminated media at the Site:

#### Alternative 1: Track 1 Unrestricted Use Remedy

Alternative 1 includes excavation and off-site disposal of all soil exceeding unrestricted use soil cleanup objectives (UUSCOs). In general, this would require excavation to a depth of approximately 14 feet across the extent of Lot 5, a total of 10,500 square feet, for a total volume of 147,000 cubic feet (5,450 cubic yards), or approximately 8,175 tons. Construction of secant walls along the southern and southeastern perimeter of the site to the top of Stratum 3 (estimated at 43 feet below grade) to prevent off-site groundwater and/or soil vapor contamination from entering the Site.

Alternative 1 includes but is not limited to:

- 1. The removal of the existing building structures;
- 2. Excavate soil exceeding UUSCOs and transport of soil off-Site for disposal to meet UUSCOs;
- 3. Collection of post-excavation confirmation samples;
- 4. Installation of a secant pile wall to form a continuous impervious structure to prevent vapor migration from an unidentified off-site source of contamination to the south;
- 5. Backfilling of the Site in accordance with applicable 6 NYCRR Part 375 and DER-10 requirements to required elevation for design grade; and,
- 6. Installation of on-Site monitoring wells for post-remedial monitoring.

#### Review of the Threshold Criteria and Balancing Criterial for Alternative 1:

- Protection of human health and the environment would be accomplished as the RAOs would be achieved.
- Compliance with standards, criteria, and guidelines (SCGs) would be satisfied as the contaminated overburden soil and groundwater adjacent to the potential off-site sources would be removed and soil beneath the building footprint would be removed to meet unrestricted use.
- Short-term effectiveness would result in removal of all soil to the top of Stratum 3 from within the Site footprint; however, this remedial alternative would have short-term impacts related to excavation, soil handling and trucking off-Site which can be the source for airborne transport of contaminated particulates and elevated soil vapor concentrations where there can be exposure to workers, pedestrians and nearby residents of the surrounding community. These short-term impacts would be minimized through implementation of control plans including a Construction Health and Safety Plan (CHASP), Community Air Monitoring Program (CAMP) and Site Management Plan (SMP) during on-Site soil disturbance activities and implementation of truck traffic controls. CAMP would be performed to determine if particulate and/or vapor mitigation action are required (e.g., water mist for dust suppression, and foam for vapor suppression). Construction workers operating under appropriate management procedures and a CHASP will don personal protective equipment (PPE) consistent with the documented risks within the respective work zones to provide protection from on-Site contaminants. Intermittent temporary closure of Redfern Avenue to residents/traffic would be required during soil load out and for mobilization of remediation equipment to the Site. Measures will be implemented to remove contaminated soil/dust from trucks prior to exiting the Site and soil tracked off-site by trucks will be cleaned continuously cleaned. Flag persons will be used to protect pedestrians at Site entrances and exits. Traffic controls and road closure permitting would be required. Increased truck traffic would be present in the community and truck traffic will be routed on the most direct course using major thoroughfares where possible. The dewatering would generate groundwater that would require treatment and short-term O&M of the treatment systems and effluent testing would be required.
- Long-term effectiveness and permanence would be satisfied as the RAOs would be achieved where the Site
  meets the unrestricted use criteria. ICs and ECs with respect to potential exposure pathways would be
  required to mitigate potential exposure to Site occupants.
- Reduction of toxicity, mobility, or volume of contaminated material would be satisfied as contaminated soil
  contributing soil vapor from beneath the building footprint would be removed and off-Site sources of CVOCs
  would be contained. Soil exceeding RRSCOs and soil vapors would be removed from the building footprint
  with the importation of backfill meeting the applicable 6 NYCRR Part 375 and DER-10 requirements for
  unrestricted use. Off-Site disposal/treatment of contaminated soil alleviates contaminants at the Site but
  transfers the risk off-Site.
- The implementability criteria would be satisfied as the excavation and dewatering are a well-established technology where there are excavation/shoring contractors and shoring equipment readily available to

- complete large deep excavations. Prospective disposal facilities have been identified and contacted to evaluate disposal requirements.
- Alternative 1 has the highest capital cost which are related to soil excavation and the installation of the secant walls. This alternative would be cost prohibitive for Site redevelopment as the excavation of Lot 5 to Stratum 3 and the Site footprint to the water table and construction of secant walls as described above would require the disposal of an estimated 36,745 tons of soil and removal of approximately 101,788 gallons of contaminated groundwater. Refer to Table 2 for a remedial cost estimation for Alternative 1.
- Community acceptance would be satisfied since this alternative would result in the restoration of the Site to unrestricted use and allow for redevelopment with a residential structure; and
- Land use is satisfied since this alternative would result in the unrestricted use of the Site which is compatible with the proposed future use of the Site is residential. The proposed use complies with as-of-right redevelopment, and is consistent with other development in the community.

#### Alternative 2: Track 2 Restricted Residential Use Remedy

#### Alternative 2 includes:

- 1. The removal of the existing buildings and drainage structures.
- Excavation and proper off-site disposal of soil exceeding the protection of groundwater SCOs (PGSCOs) for chlorinated solvents to approximately 8 fbg from two (2) hotspots identified as SB-1 and SB-4 on Lot 5, and soil in the remainder of the site to achieve restricted residential SCOs (RRSCOs) in the upper 15 feet.
- 3. Collection of post-excavation confirmation soil samples.
- 4. Import of backfill material to the Site in accordance with applicable 6 NYCRR Part 375 and DER-10 requirements as needed to meet development elevation.
- 5. Installation of an active SSDS to mitigate the potential for soil vapor intrusion into the new building.
- Implementation of a permeable reactive barrier (PRB) along the upgradient property boundary to address future
  migration of contaminated groundwater from offsite sources onto the Site. A separate remedial design will be
  submitted following pilot testing.
- 7. Construction and operation of a soil vapor extraction (SVE) system on the southern portion of the Site to capture and treat residual contaminants impacts present in unsaturated soil that could not be excavated during the remedy,.
- 8. Four rounds of post-treatment groundwater monitoring to confirm effectiveness of the PRB.
- 9. Implementing a Site Management Plan.
- 10. Recording of an Environmental Easement.

#### Review of the Threshold Criteria and Balancing Criterial for Alternative 2:

Alternative 2 (Track 2) is protective of human health and the environment because the contaminant mass
from the hot-spot areas will be removed and potential off-site sources would be isolated or contained.

Excavation of other soil with concentrations above the Restricted Residential (RR) SCO for PCE in
conjunction with ICs and ECs will prevent potential exposure to residual contamination in soil, soil vapor and
groundwater.

- Compliance with standards, criteria, and guidelines (SCGs) would be satisfied by achieving removal of the soil above the PCE RR SCO. Compliance with SCGs for soil vapor would also be achieved by ECs that would provide for protection of human health and the environment to contaminant exposure.
- Short-term effectiveness would result in removal of contaminated soil (source area mass and soil above RR SCOs); however, this remedial alternative would have short-term impacts related to excavation, soil handling and trucking off-Site which can be the source for airborne transport of contaminated particulates and elevated soil vapor concentrations where there can be exposure to workers, pedestrians and nearby residents of the surrounding community. These short-term impacts would be minimized through implementation of control plans including a CHASP, CAMP and SMMP during on-Site soil disturbance activities and implementation of truck traffic controls. CAMP would be performed to determine if particulate and/or vapor mitigation action are required (e.g., water mist for dust suppression, and foam for vapor suppression). Construction and environmental workers operating under appropriate management procedures, HASP and a CHASP will don personal protective equipment (PPE) consistent with the documented risks within the respective work zones to provide protection from on-Site contaminants. Intermittent temporary closure Redfern Avenue to residents/traffic would be required during soil load out and for mobilization of remediation equipment to the Site. Measures will be implemented to remove contaminated soil/dust from trucks prior to exiting the Site and soil tracked off-site by trucks will be cleaned continuously cleaned. Flag persons will be used to protect pedestrians at Site entrances and exits. Traffic controls and road closure permitting would be required. Increased truck traffic would be present in the community and truck traffic will be routed on the most direct course using major thoroughfares where possible.
- Long-term effectiveness and permanence would be satisfied as soil above the RR SCO for PCE will be
  removed from the Site, contaminated groundwater from the off-site source area will be contained, and
  groundwater/saturated soil contamination on-site will be allowed to naturally attenuate at an accelerated
  rate to reach asymptotic levels and Site remedial goals.
- Inclusion of ICs and ECs will be required to reduce the potential for exposure of future occupants to contaminated media thus achieving the RAOs for the Site.
- Reduction of toxicity, mobility, or volume of contaminated material would be satisfied as contaminated soil
  would be permanently removed from the Site. Excavation of soil above the RR SCO would be completed and
  contaminated groundwater would be reduced thereby achieving a reduction in the volume, mobility and toxic
  exposure of COCs.
- Implementability would be satisfied as excavation is a well-established technology. Prospective disposal facilities have been identified and contacted to evaluate disposal requirements. The in-situ chemical reagents to create a PRB for saturated soil and groundwater are also well-established technologies where mobilization of specialized equipment and trained labor force are readily available.

- Alternative 2 (Track 2) has lower capital costs for implementation versus Alternative 1. The focused
  excavation approach would require the disposal of less soil (estimated 400 tons [258 cubic yards]). Overall,
  this approach allows the property owner to save time and money while providing significant risk
  management. Refer to Table 3 for a remedial cost estimation for Alternative 2.
- Community acceptance would be satisfied since this alternative provides ICs and ECs to prevent vapor
  intrusion and manage risk where minimal residual contamination may be present and allow for
  redevelopment with a residential structure; and
- Land use is satisfied since this alternative would result in the restricted use of the Site that is compatible with the proposed future use as a multi-story mixed use building.

## 3.3 Selection of Preferred Remedy

A criterion for remedy selection is an evaluation for conformance with SCGs that are applicable, relevant and appropriate. Principal SCGs that are applicable, relevant and appropriate for evaluating the alternatives for remediation of the BCP Sites include the following:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives (see Table 1)
- New York State Groundwater Quality Standards 6 NYCRR Part 703
- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation May 3, 2010
- NYSDEC Draft Brownfield Cleanup Program Guide May 2004
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYS Waste Transporter Permits 6 NYCRR Part 364; and
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364.

Based on the evaluation of the Site in terms of the Threshold and Balancing Criteria discussed in the previous sections and the conformance with SCGs, the preferred remedy is Alternative 2 (Track 2) cleanup.

Alternative 2 (Track 2) was found to be the most appropriate and cost-effective approach since it achieves the RAOs while meeting restricted use guidance and is more cost-effective in terms of the proposed redevelopment project. This remediation alternative permanently and significantly reduces the volume of contaminants, mobility and toxicity at the Site, while requiring the removal and off-Site disposal of a smaller mass of contaminated soil from the Site.

#### **3.2.1 Zoning**

The Site has three (3) NYC Zoning designations: R6 for residential uses; DFR (special Downtown Far Rockaway District) for mixeduses; and C2-4 for commercial uses. Based on review of historical New York City Department of Buildings Certificate of Occupancies covering the Site area from September 1970 through 2020, the Site had an R5 zoning

designation (low density residential) with commercial overlays from September 1970 through 1992.

The proposed development will include the construction of a 4-story homeless shelter and supportive affordable housing complex which is in keeping with the current R6 and DFR zoning regulations of for the Site. The proposed remedy conforms to residential use and the proposed development is consistent with the proposed zoning.

# 3.2.2 Applicable Comprehensive Community Master Plans or Land Use Plans

Currently, no comprehensive community master plans, local waterfront revitalization plans, designated Brownfield Opportunity Area plans or other known adopted land use plans are in place that includes the area encompassing the Site.

# 3.2.3 Surrounding Property Uses

The surrounding land use includes some industrial, commercial and residential properties, including a planned 9-story high rise with a below grade parking garage structure to the south and a multi-story high rise residential structure to the east, currently under construction; The Site is bordered to the north by a strip mall containing several retail stores (Karen Hair Design, Roberts Delight restaurant, Amanah Deli & Grocery, and Little Caesar Pizza) and a row of multifamily residential dwellings, to the south by a strip mall containing several retail stores (Crown Fried Chicken, Sammy M Deli & Grocery, New Butterflies Chinese restaurant, Urban Home Sports Wear, Express shoe repair, George and Chris Cleaners, Money Gram, Alex Magic Electronics, Jamaica Breeze Buffet restaurant and Fish store) and Mott Avenue, and to the west by Beach Channel Drive and several commercial properties (Taco Bell, Klean and Kleaner Laundromat, and Shop Fair grocery store). The proposed redevelopment of the property with a multi-use commercial/ residential apartment building as part of Alternative 2 (Track 2) is in keeping with the current surrounding properties.

## 3.2.4 Citizen Participation

The approved Citizen Participation Plan (CPP) has been prepared and is provided as **Appendix C** to this RAWP. Thus far there have been no written or oral comments submitted by the public relating to the proposed redevelopment.

#### 3.2.5 Environmental Justice Concerns

The Site is not 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 and/or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. The Site redevelopment/remedial Alternative 2 (Track 2) is not anticipated to cause or increase a disproportionate burden on the community in which the Site is located, as the construction of a multi-floor homeless shelter and supportive housing facility is in accordance with the guidelines of the R-6 and DFR special uses zoning district in which it resides.

#### 3.2.6 Land Use Designations

The property is E-designated with Environmental Restrictions for Hazardous Materials and Air Quality (E-415) under City Environmental Quality Review (CEQR) Negative Declaration #16DME010Q. The E-Designation sets forth the following restrictions upon the Site with regards to interior Noise:

"Development will require installation of a specific window/wall attenuation and alternate means of ventilation"

The proposed redevelopment/Remedial Alternative 2 (Track 2), and Environmental activities thus far have and will adhere to the Environmental Restrictions set forth in CEQR 16DME010Q. The proposed remedy conforms, and the proposed development is consistent with the land use for this area.

## 3.2.7 Population Growth Patterns

Based on the New York City Census Population Projections, the population of Queens will have increased from 2,250,002 in 2010, to 2,330,295, in 2020; an increase of 80,293 or 3.6%. The projected increase in population patterns in the area of the Site supports the proposed future use of the property as a multi-use homeless shelter and supportive housing complex to address the needs of the local population and future growth.

# 3.2.8 Accessibility to Existing Infrastructure

The proposed Site redevelopment has accessibility to existing infrastructure. Sewer and water supply are readily available. The nearest public bus stop is one block to the southeast, along Mott Avenue, while the nearest public subway station is located two blocks to the south-east located on the intersection of Mott Avenue and 22nd Street. There are several schools within the local area also, with PS 253 located on Central Avenue approximately four blocks northwest of the Site.

#### 3.2.9 Proximity to Cultural Resources

There are no important cultural resources, including federal or state historic or heritage sites or Native American religious sites proximal to the proposed redevelopment. Therefore, the proposed remedy will not impact cultural resources.

## 3.2.10 Proximity to Natural Resources

There are no significant natural resources, including important federal, state or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species in proximity to the proposed redevelopment that will be affected by the remedial Alternative 2 (Track 2). There are no natural resources proximal to the Site; however, Motts Basin is located nearly 1 mile north of the Site.

# 3.2.11 Off-Site Groundwater Impacts

Based on the results of the RI, there may be adjacent off-Site groundwater impacts consisting of a dry cleaners and known chemical use facility (21-40 Mott Avenue [abutting property to the south] and 20-02 Mott Avenue), and several gasoline stations with known NYSDEC spill cases in the vicinity. There are no known groundwater well heads, groundwater recharge areas, or other areas identified by the state comprehensive groundwater remediation and protection program proximal to the Site that might be vulnerable to contamination present in the groundwater.

# **3.2.12** Proximity to Floodplains

The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain, however, approximately 25% of the property lies within a "Zone X" 0.2% Annual Chance Flood Hazard area. Remedial Alternative 2 (Track 2) is not likely to be significantly affected by the local flood plains.

#### 3.2.13 Geography and Geology of the Site

The geology of the southern portion of Queens County consists of unconsolidated deposits of clay, silt, sand and gravel of predominantly glacial origin that overly a generally southward sloping consolidated bedrock. Glacial and alluvial overburden deposits make up the upper glacial aquifer and are themselves overlain by urban fill or made land derived from imported fill or mixtures of indigenous materials and imported fill. Bedrock is absent to depths greater than 100 feet. A geologic map, derived from the USGS National Geologic Map Database, shows the geology in the areas is marine deposits (beach deposits) consisting of medium to coarse grained beach and eolian sand and glacial outwash comprised of unconsolidated sand, silt and clay with lesser gravel. The geology beneath the Site is classified as Upper Pleistocene glacial outwash consisting of quartz sand, silt and clay. The Geotechnical Evaluation Report by GEO Design identified four (4) Stratum beneath the Site, as follows:

- The first and shallowest, was classified as Uncontrolled Fill, consisting of brown to black coarse to fine sand with varying amounts of misc. fill and was present to an approximate depth of 5 feet.
- This was followed by Stratum 2, classified as the Upper Sand, consisting of brown to gray coarse to fine sand with varying amounts of gravel and silts with a thickness of approximately 30 to 35 feet,
- Stratum 3 was Silt and Clay consisting of brown to gray silt and clay with an approximate thickness ranging from 25 30 feet. The basal stratum was referred to as the Lower Sand, consisting of gray fine sand with varying amounts of gravel and silt extending to at least 100 feet.

Depth to groundwater varies from across the Site due changes in topographic elevation and was measured between 13.41 fbg on Lot 9 and 19.01 fbg on Lot 5. Groundwater flow direction is generally to the north. The underlying groundwater in this area of Queens is not used for potable supply purposes. Potable water is provided to the area by the New York City Department of Environmental Protection. The soil beneath the Site along a generally east-west trend on Lot 5 as described by IEC is stratigraphically discontinuous sand, silt and clay underlying a thin veneer of fill material,

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asphalt and concrete pavement. Sands consist of light brown fine to medium poorly graded sand (Unified Soil Classification System [USCS] Group SP) with trace gravel silt from grade to 12 fbg, and brown fine to medium, silty sand to poorly graded sand (USCS Groups SM/SP) with little silt from 12 to 20 fbg. From 20 fbg to 34 fbg, the deposits are described as dark brown fine to medium, silty sand to poorly graded sand (USCS Groups SM/SP) with little silt grading into silt and clay at 43 feet, clay at approximately 52 feet and again sand at 66 feet. Bedrock was not encountered. Saturated soil was encountered between approximately 13 on Lot 9 (north) and 17 fbg on lot 5 (south).

#### 3.2.14 Current Institutional Controls

The Site is E-Designated (E-415) for Hazardous Materials and Air Quality which are considered an institutional control implemented by the City of New York that needs to be adhered to if and when the property is redeveloped, or its usage changed.

# 3.3 Summary of Selected Remedial Action

The proposed remedial action will consist of:

- 1. Demolition of the existing buildings will be completed prior to the remedial action.
- 2. Mobilization to the Site for the start of the remedial work will involve Site security and construction boundary setups, equipment mobilization, utility mark outs and marking and staking excavation areas.
- 3. Soil with detected PCE concentrations, including borings SB-1N, SB-1S, SB-4W and SB-4N, which represent the on-Site hot-spot areas and occur on the south and southeastern portion of the Site on Lot 5 (refer to Plate 4). These two areas will be sequestered to prevent future migration of PCE from potential off-site sources to the south.
- 4. Hot-spot area excavation will be performed on the southern portion of the Site on Lot 5. Two areas identified as SB-1 and SB-4 with concentrations exceeding the RR SCO for PCE will be excavated to 8 fbg, and extend laterally until the referenced standard is achieved via confirmation endpoint samples. An estimated 400 tons (258 cubic yards) of soil is anticipated for off-Site transportation and disposal.
- 5. Excavation of other areas of soil on the Site that may exceed the RR SCOS for PCE in shallow unsaturated soils will be completed to depth as determined by end point field screening and six (6) confirmation samples. These areas include excavation of the proposed building and for installation of stormwater conveyance system components. An estimated 400 tons (258 cubic yards) is expected as part of the remedy for on-Site soil removal and 5,400 tons for construction-related excavation. The footings on the eastern portion of the Site are in an area where the soil data indicates PCE concentrations are below the Unrestricted Use SCO as well as the RR SCOs.
- 6. During soil excavation and intrusive Site work where soil is disturbed, field screening of soil will be performed for indications of contamination by visual means, odor and with a photoionization detector (PID). Appropriate

- segregation of excavated soil will be evaluated based on the results of the field screening data. Management of excavated materials including temporary stockpiles and segregating in accordance with defined material types will be performed to prevent co-mingling of contaminated material and non-contaminated materials.
- 7. During soil excavation and intrusive Site work where soil is disturbed through excavation and load out on trucks, air monitoring will be performed. A Community Air Monitoring Program (CAMP) will be implemented for evaluation of particulates and VOCs. A water mist and/or vapor mitigation foam or similar product would be available on the Site and applied during excavation and soil disturbance as required to control particulates and vapor, as necessary.
- 8. Excavation and removal of soil/fill exceeding the RR SCO for PCE will be completed in phases by an OSHA trained excavation contractor. The remedial excavation will incorporate a total combined footprint area of approximately 1,125 square feet down to "clean sand" expected to be at depths not exceeding 8 fbg. This excavation will encompass the on-Site hot-spot area contaminant mass associated with SB-1 and SB-4. It is estimated that 400 tons (258\_\_\_\_ cubic yards) of soil will be removed for off-Site disposal from these excavations.
- 9. Off-site disposal of material removed from the Site will be performed in accordance with applicable regulations for handling, transport and disposal at permitted facilities.
- 10. Abandonment of on-Site groundwater monitoring wells will be completed in accordance with the requirements of CP-43 since these wells will be impacted by the Site remediation and redevelopment work.
- 11. Imported materials for backfill will be in compliance with this plan and in accordance with the lower of 6 NYCRR Part 375 Restricted Residential or Groundwater Protection SCOs as well as other applicable laws and regulations. Areas excavated to terminal depths will be backfilled with a self-compacting virgin stone or equivalent topped with a geotextile fabric and then backfilled with imported material to the elevations required for construction. Gravel, rock or stone, consisting of virgin material from a permitted mine or quarry may be imported without chemical testing provided it contains less than 10% by weight material which would pass through a size 80 sieve. The property owner's structural engineer will provide compaction requirements for the Site.
- 12. Once the hot-spot excavation is complete at the Site, soil vapor samples will be collected through temporary soil gas implants for PCE analysis to evaluate the post-excavation conditions. This soil vapor data will be used to prepare the final design for the proposed SVE system on Lot 5. Groundwater and saturated soil at the southern property boundary will be the focus for barrier wall installation based on the existing RI data. The chemical selected for this application is micro-scale activated carbon with contaminant biodegradation enhancers. PCE will adsorb onto colloids formed on the carbon substrate and colonized by contaminant-degrading bacteria. The application of the micro-carbon will provide a continued barrier to inhibit off-site source migration and allow for the existing groundwater onsite to achieve more rapid and complete natural

attenuation. Groundwater monitoring would be conducted in order to evaluate and track trends in groundwater quality over time after the installation of the activated carbon barrier. Four (4) existing nested wells (both shallow and intermediate depth), and four (4) proposed new cluster wells (both shallow and intermediate depth) will be utilized to monitor the effectiveness of the remedy (see **Plate 14**). A minimum of four (4) rounds of sampling over a period of one year is anticipated. Subsequent groundwater monitoring requirements after the initial four rounds will be determined in consultation with the NYSDEC. The proposed in-situ groundwater treatment details and specifications will be provided as a separate Remedial Design Document.

- 13. As part of the remedy, a Soil Vapor Extraction (SVE) system will be installed along the southern boundary of the Site. This system will actively extract contaminated vapors from the subsurface via three (3) soil vapor extraction wells proximal to the southern Site boundary, and the location of the highest soil vapor contaminant concentrations. The extraction wells will be connected to an SVE blower, contained within a bespoke SVE System shed, via 3-inch schedule 40 PVC piping. The purpose of this SVE system is to mitigate vapors migrating onto the Site from offsite sources from affecting the proposed redevelopment.
- 14. As part of building foundation construction, a vapor barrier system and an active SSDS will be installed beneath the building slab to mitigate soil vapor migration into the building. The vapor barrier is an element of construction, and not part of the remedial action. The vapor barrier system will consist of a Stego Industries branded Drago Wrap Vapor Intrusion Barrier 20-mil thick chemical resistant waterproofing membrane for horizontal applications beneath the building slab across the site and for vertical applications, outside the building footprint. Equivalent vapor and waterproofing systems will be evaluated if needed. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. The SSDS will consist of 3-inch diameter sub-slab vapor intake points with vertical risers. The sub-slab intake points will be vented using suction-pit technology to provide even air flow and vacuum beneath the vapor barrier. Each intake point will be valved for individual control. The risers will transition to the first floor where laterals will be installed to four (4) separate risers to the roof where they will be connected in series to a dedicated intake fan on the roof.
- 15. Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC Decision Document. Deviations from the RAWP and Decision Document will be reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER). A final FER will be submitted that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site.
- 16. The establishment of ECs and ICs described in this RAWP require the management in compliance with an approved Site Management Plan (SMP). An Environmental Easement, that includes the ICs and ECs, will be recorded, and will likely include the following: (1) vegetable gardening and farming; (2) use of groundwater

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without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without NYSDEC approval. A SMP will be prepared for the long-term management of residual contamination as required, including plans for: 1) ICs and ECs, 2) monitoring, 3) operation and maintenance and 4) reporting.

# 4 GOVERNING DOCUMENTS

The remedial activities performed under the RAWP will adhere to the following governing documents to maintain the protection of remediation and construction workers and the public, provide quality assurance (QA) and quality control (QC), ensure the proper handling and management of Site soils/materials, and maintain communications with the community during the remedial activities.

# 4.1 Standards, Criteria and Guidance

The following standards, criteria, and guidance (SCGs) are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

| Citation              | Document Title  | Regulatory<br>Agency |
|-----------------------|---|----------------------|
| General               |   |                      |
| 6 NYCRR Part 375      | Environmental Remediation Programs  | NYSDEC               |
| 29 CFR 1926           | Safety and Health Regulations for Construction  | USDOL, OSHA          |
| n/a                   | Analytical Services Protocol  | NYSDEC               |
| DER-10                | Technical Guidance for Site Investigation and Remediation   | NYSDEC               |
| DER-23                | Citizen Participation Handbook for Remedial Programs (March 2010)                                     | NYSDEC               |
|                       | Sampling, Analysis, and Assessment of Per-and Polyfluoroalkyl Substances (PFAS) – January 2021        | NYSDEC               |
| Soil                  |   |                      |
| 6 NYCRR Part 375      | Environmental Remediation Programs  | NYSDEC               |
| CP-51                 | Soil Cleanup Guidance   | NYSDEC               |
| Groundwater           |   |                      |
| 6 NYCRR Part 700-705  | Surface Water and Ground Water Classification Standards   | NYSDEC               |
| TOGS 1.1.1            | Ambient Water Quality Standards and Guidance Values (AWQSGVs)   |                      |
| 40 CFR Part 144       | Underground Injection Control Program   |                      |
| n/a                   | Sampling, Analysis, and Assessment of PFAS – January 2021   | NYSDEC               |
| Air/Soil Vapor        |   |                      |
| DAR-1                 | Guidelines for the Evaluation and Control of Ambient Air Contaminants<br>Under Part 212               | NYSDEC               |
| n/a                   | Final - Guidance for Evaluating Soil Vapor Intrusion in the State of New York                         | NYSDOH               |
| Solid/Hazardous Waste |   |                      |
| 6 NYCRR 360           | Solid Waste Management Facilities   | NYSDEC               |
| 6 NYCRR 364           | Waste Transporters  | NYSDEC               |
| 6 NYCRR 371           | Identification and Listing of Hazardous Waste   | NYSDEC               |
| 6 NYCRR 372           | Hazardous Waste Manifest System and Related Standards for Generators,<br>Transporters, and Facilities | NYSDEC               |
| 6 NYCRR 376           | Land Disposal Restrictions  | NYSDEC               |
| Site Management       |   | •                    |
| CP-43                 | Commissioner Policy on Groundwater Monitoring Well Decommissioning – December 2009                    | NYSDEC               |

# 4.1.4 Site Specific Health & Safety Plan (HASP)

All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by the Federal OSHA. A Site-specific HASP that conforms to OSHA regulations is included as **Appendix D**. The Site Safety Coordinator will be Mr. Dan Fruhauf. Resumes of key personnel involved in the remedial action are included in **Appendix H**.

The BCD Owner LLC 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 Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The Site-specific 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.

# 4.1.5 Quality Assurance Project Plan (QAPP)

A complete Quality Assurance Project Plan (QAPP) is provided in **Appendix E** for the RAWP activities described herein. The QAPP dictates implementation of the remedial tasks delineated in this Work Plan. Refer to QAPP Table 1 and Table 2 for a summary of the endpoint sample analytical program summary and the sample parameters, holding times and sample container requirements, respectively. The QAPP includes all requirements outlined in DER 10 Section 2.4.

## 4.1.6 Soil/Materials Management Plan (SMP)

A complete Soil/Materials Management Plan (SMP) is provided in Section 5.5 of this report for the RAWP activities described herein.

## 4.1.7 Erosion and Sediment Controls

The erosion and sediment controls to be implemented during the on-Site Remedial Action will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Since the area of disturbance will be less than one acre, a Stormwater Pollution Prevention Plan (SWPPP) is not required for the Remedial Action.

## 4.1.8 Community Air Monitoring Plan (CAMP)

A complete Community Air Monitoring Plan (CAMP) is provided in section 5.5.12 of this report for the RAWP activities described herein. The CAMP will outline the procedures relating to the following: VOC Monitoring; VOC response levels; Particulate Monitoring; Particulate response levels; and mitigatory measures and actions designed to suppress elevated VOC and Particulate levels.

# 4.1.9 Contractors Site Operations Plan (SOP)

The selected remedial contractor will be required to prepare a work plan for submittal prior to soil disturbance activity. The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they are in compliance with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, are in compliance with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

## 4.1.10 Citizen Participation Plan

The NYSDEC and BCD Owner LLC have established this CPP because the opportunity for citizen participation is an important component of the NYS BCP. This CPP describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYSDEC BCP, BCD Owner LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYSDEC until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to the NYSDEC's project manager assigned to this Site, Mr. Christopher Allan, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (718) 482-4065.

A certification of mailing will be sent by the BCD Owner LLC 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 on (specific date) and that it contained all of applicable project documents. All fact sheets will be translated into Spanish.

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 approved CPP for this project is attached in **Appendix C**.

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

**Queens Public Library Central** 

89-11 Merrick Boulevard, Jamaica New York 11432 (718) 990-8585

**Queens Community Board 14** 

19-31 Mott Avenue, Far Rockaway New York 11691 (718) 471-7300

**DECinfo Locator** 

https://gisservices.dec.ny.gov/gis/dil/

### 4.2 General Remedial Construction Information

# 4.2.1 Project Organization

Impact Environmental Engineering and Geology PLLC

Impact will coordinate all Site activities being implemented to achieve the remedial objectives defined in the RAWP. Impact will provide continual review of all quality control measures implemented by the contractors to ensure compliance with the Site's remedial objectives. As such, Impact will provide oversight services for the duration of the remedial activities. The implementation of the on-Site Remedial Action construction will be sequenced based on construction requirements, environmental considerations, and logistics based on entry points and staging areas. Principal personnel from impact who will participate in the remedial action include:

- Kevin Kleaka, principal-in-charge of this project and as such he is responsible for all project elements and will
  act to ensure the success of the project.
- Xin Yuan, a professional engineer licensed in the State of New York, will be act as the Remedial Engineer and be responsible for certifying that the remediation construction was completed in substantial conformance with the approved RAWP and/or any NYSDEC-approved field changes. The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan.
- Greg Mendez-Chicas, is the Qualified Environmental Professional (QEP) for this project and will act as the overall manager for implementation of remedial actions. In this capacity, Mr. Mendez-Chicas will be responsible for the overall coordination associated with implementation of RAWP. He will coordinate and supervise IEC project and field engineers/scientists, as well as subcontractors; ensure adherence to and successful completion of RAWP tasks; interface with the data validator during development of Data Usability Summary Reports and subsequent reporting and documentation of the work performed.

Christopher Connolly, will act as the Project Scientist, responsible for direction of the field program for
implementation of the remedial action tasks. Responsibilities will include maintaining quality assurance
policies related to various media sample collection, interface with the laboratory, directing subcontractor
activities, and ensuring the successful completion of all RAWP field activities.

 Dan Fruhauf, will act as the Site Superintendent, keeping detailed records of all remedial activities and health and safety monitoring

• Alex Keenan, will act as the health and safety coordinator for the project.

Juliana de la Fuente, will be the Quality Assurance and Quality Control (QA/QC) officer and will be responsible
for the overall quality assurance and review of the project deliverables. She will interface with the Project
Manager to address technical issues and provide quality control for the entire project.

Christina Rink-Ashdown, of Laboratory Data Consultants, Inc (LDC) will be utilized for Data Validation Services
in relation to laboratory analytical reports generated as part of the confirmatory endpoint sample collection.
Ms. Rink-Ashdown will prepare and issue Data Usability Summary Reports (DUSRs) for any Category B Data
Deliverables generated as part of the onsite sampling and analysis.

Resumes of key personnel involved in the Remedial Action are included in Appendix H.

## **BCD Owner LLC**

As a managing member of the Volunteer, BCD Owner LLC, Mr. Joshua Weisstuch will coordinate communications with regulatory agencies, provide general oversight of all aspects of the remediation, review, and submission of all documents, publish community notifications, and address community concerns.

#### Alpha Analytical, Inc.

Alpha Analytical, Inc. (Alpha) will be utilized for all remediation construction-related analytical requirements. Alpha is a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. All results will be reported in electronic format deliverables prepared in accordance with NYSDEC requirements. Formal laboratory qualifications and Quality Assurance/Quality Control (QA/QC) information packages for Alpha and any other analytical laboratories proposed for the project will be submitted to the NYSDEC or disposal facilities, if requested.

## Urban Atelier Group (UAG)

The soil Remedial Contractor is responsible for the excavation of portions of the Site to the required depths as well as transportation and disposal of contaminated excavated materials, and all other contaminated wastes generated, and non-contaminated materials (if any). They are also responsible for installation of the SSDS system, vapor barrier and other applicable ECs. The primary environmental obligations of this contractor include safely managing all excavated materials, preventing the contaminated Site soils from being tracked off-Site, dust/odor control, and decontamination of equipment, as necessary.

#### 4.2.4 Work Hours

The hours for operation of on-Site remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Volunteer/Applicant of any variances issued by the Department of Buildings. NYSDEC reserves the right to deny alternate remedial construction hours.

# 4.2.5 Site Security

Site access will be controlled by an 8-foot high construction fence, with access restricted by a sliding padlocked gate. During all remedial activities access to the properties will be limited to authorized remedial and construction workers. Visitors to the Site will be required to sign a log book and meet applicable health and safety requirements. The area of work at the Site will be fenced to delineate and secure areas of excavation.

# 4.2.6 Traffic Control

Drivers of trucks leaving the Site with soil/fill will be instructed to proceed without stopping in the vicinity of the Site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is as follows:

- 1. Trucks should leave the Site heading east on Redfern Avenue, then taking the first left onto Doughty Blvd;
- 2. Take Doughty Blvd. north to the junction of Bayview Avenue and make a right, heading east;
- 3. From Bayview Avenue turn left onto NY 878/Nassau Expressway. Continue north;
- 4. Take the ramp on the left and follow the signs to Van Wyck Expressway toward Linden Blvd;
- 5. Turn left onto 109th Avenue, then turn right onto 135th Street; and,
- 6. Turn right onto 105<sup>th</sup> Avenue and then immediately turn right onto Van Wyck Expressway and onto your destination

Refer to **Plate 7** for map of truck route.

### 4.2.7 Contingency Plan

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to NYSDECs Project Manager. Petroleum spills will be reported to the NYSDEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material, including sidewall and bottom endpoint samples, and reported to NYSDEC. Chemical analytical testing will be performed for TCL VOCs by USEPA Method 8260, TCL SVOCs by USEPA Method 8270, TAL metals by USEPA Method 6010, TCL pesticides by USEPA Method 8081, PCBs by USEPA Method 8082A, and NY List of

21 PFAS Compounds (Emerging Contaminants) by USEPA Method 537..

## 4.2.8 Worker Training and Monitoring

All general Site workers (as defined in OSHA 1910.120 (e)(3)(i)) that will be directly involved with soil disturbance activities will have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations (40 Hour HAZWOPER training). Soil disturbance activities are defined as excavation, backfilling, and regrading materials at the Site prior to removal of all impacted material with concentrations exceeding RR SCOs.

# 4.2.9 Agency Approvals

A complete list of all local, regional, and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and development excavation work, which will contain 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, will be included in the Final Engineering Report.

No planned remedial or construction work will occur in regulated wetlands or adjacent areas.

# 4.2.10 Pre-Construction Meeting with NYSDEC

A project kick-off meeting (likely virtual due to COVID-19) will be conducted with the Volunteer, IEC, NYSDEC, and the selected excavation Contractor and subcontractors responsible for construction of the SSDS, SVE and/or groundwater treatment prior to the commencement of any intrusive remedial activities proposed in this RAWP.

## 4.2.11 Emergency Contacts

An emergency contact sheet with names and phone numbers of the environmental team members is provided below. This table defines the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

| Title/Name                          | E-Mail                          | Phone Numbers         |
|-------------------------------------|---------------------------------|-----------------------|
| Medical, Fire and Police            | -                               | 911                   |
|                                     | -                               | (800) 272-4480 (3-day |
|                                     |                                 | minimum notice        |
| One Call Center                     |                                 | required)             |
| Poison Control Center               | -                               | (800) 222-1222        |
| NYSDEC Spills Hotline               | -                               | (800) 457-7362        |
| Principle/Kevin Kleaka (IEC)        | kkleaka@impactenvironmental.com | 631-269-8800 x129     |
| Xin Yuan, Remedial Engineer (IEC)   | xyuan@impactenvironmental.com   | 631-269-8800 x110     |
| Greg Mendez-Chicas, Sr. Project     | Gmendez-                        |                       |
| Manager (IEC)                       | chicas@impactenvironmental.com  | 631-269-8800 x124     |
| Christopher Allan (NYSDEC)          | christopher.allan@dec.ny.gov    | (718) 482-4065        |
| Mandy Yau (NYSDEC)                  | mandy.yau@dec.ny.gov            | (718) 482-4897        |
| Eamonn O'Neil                       | eamonn.oneil@health.ny.gov      | (518) 402-7877        |
| Joshua Weisstuch (representative of | jweisstuch@camberpg.com         |                       |
| Volunteer)                          |                                 | (914) 384-2478        |

The Site-specific HASP will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency. Since the contractors have not yet been selected, the emergency contact list will be prepared prior to the start of work and the HASP will be updated.

# 4.2.13 Remedial Action Costs (Track 2)

The total estimated cost for **On-Site Remedial Alternative 2** (Track 2) remedy is \$1,050,315. The costs associated with On-Site Remedial Alternative 1 are significantly higher than On-Site Remedial Alternative 2 (Track 2) due to the additional excavation, backfill materials, off-Site disposal, secant wall that will be required to achieve Track 1 Unrestricted Use SCOs throughout the Site. On-Site Remedial Alternative 2 (Track 2) includes long term costs associated with implementation of the SMP, operation and maintenance of an SSDS and SVE system, and performance evaluation,. Refer to **Table 2** and **Table 3** for an itemized and detailed summary of remedial alternative cost estimates. This will be revised based on actual costs and submitted as an an appendix in the FER.

# 4.3 Site Preparation

### 4.3.1 Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. These activities include:

- 1. Mobilization of equipment to the Site;
- 2. Field personnel orientation;
- 3. Installation of temporary perimeter fencing and traffic barricades to delineate the work zone and act as a work site security measure;
- 4. Installation of erosion and sediment control measures;
- 5. Set-up of decontamination facilities, which are expected to be limited due to the nature of the project; and,
- 6. Marking/staking sampling locations and utility mark-outs.

## 4.3.2 Monitoring Well Decommissioning

Existing groundwater monitoring wells will either be protected during former building slab demolition, remediation and redevelopment for use in post-remedial monitoring, or will be properly decommissioned in accordance with NYSDEC policy CP-43. It is anticipated that the following wells installed as part of the RI will be protected during the remedy: MW-1, MW-2, MW-7s, MW-7i, MW-8s, MW-8i, MW-9s, MW-9i, and MW-10. Based on their location, in the footprint of the proposed redevelopment, the following wells are anticipated to be decommissioned: MW-3, MW-4s, MW-4i, MW-5, MW-6, and MW-11.

## 4.3.3 Erosion and Sedimentation Controls

Erosion and sediment control measures identified in this remedial plan (e.g., silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and

after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to

determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of

inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All

necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier

and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with

appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged

due to weathering.

4.3.5 Utility Marker and Easements Layout

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work

such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities

may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will

be performed incompliance with applicable laws and regulations including NYC Building Code to assure safety. Utility

companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the

Mark-Out Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface

operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated

with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead

power lines and drill rig masts.

The Volunteer and its contractors are 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 must 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.

4.3.6 Structural Stability

Appropriate management of structural stability of on-Site or off-Site structures during on-Site activities include

excavation is the sole responsibility of the Volunteer and its contractors.

4.3.7 Equipment and Material Staging

Equipment and materials for the on-Site remedial construction will be staged on-Site in a designated, secure area.

4.3.8 Stabilized Construction Entrance(s)/Decontamination Area

Due to the nature of the project, the structures and asphalt parking lot will be removed and development related

construction will be ongoing at the same time. Therefore, a stabilized construction entrance/exit is required for this

Site. Care will be taken to avoid spillage of soil onto the asphalt in the work area, to the extent practicable. Once

excavation is complete any soil spilled will be removed and the asphalt will be restored. Any soil spilled on the sidewalk

or street immediately adjacent to the Site will be promptly removed and the street will be cleaned.

4.3.9 Site Fencing

Site access will be controlled by an 8-foot high perimeter barrier during the bulk of construction. The Contractor shall

protect the work areas by installation of temporary Site perimeter fencing to control public access and protect the site

from theft and vandalism. The Contractor shall erect, maintain, and dismantle temporary fencing around construction

site and materials storage areas. Unless otherwise indicated, type of temporary chain link fencing shall be Contractor's

option. Other fencing acceptable if in compliance with the NYC Department of Building's requirements.

The fences and gates will be closed and locked when there is no activity on the Site and any breaks or gaps will be

repaired immediately. Cones or other portable barricades will supplement the perimeter fencing to delineate and

secure the area of ongoing remediation activities within the Site such as soil stockpiles and health and safety exclusion

zones.

4.3.10 Demobilization

Demobilization will include:

As necessary, restoration of temporary access areas and areas that may have been disturbed to

accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water

management areas, and access area);

Removal of sediment from erosion control measures and disposal of materials in accordance with

applicable laws and regulations;

Equipment decontamination, and;

General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. . In addition, all

investigation and remediation derived waste will be appropriately disposed.

## 4.4 Reporting

Site activities and progress will be reported on a daily and monthly basis as described below. All daily and monthly Reports will be included in the FER.

## 4.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by noon each day following 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;
- Photographs of daily activities;
- 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 finding, including excursions;
- An explanation of notable Site conditions; and,
- Description of anticipated activities.

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. The NYSDEC assigned project number will appear on all reports.

# 4.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10<sup>th</sup> day of the following month 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 (i.e. tons 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.

# 4.4.4 Complaint Management Plan

All complaints from citizens will be promptly reported to the NYSDEC Project Manager. Complaints will be addressed, and outcomes will also be reported to NYSDEC as soon as possible and will also be documented in daily reports. Notices to NYSDEC will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

# 4.4.5 Deviations from the Remedial Action Work Plan

All changes to the RAWP will be reported to, and approved by, the NYSDEC Project Manager and will be documented in daily reports and reported in the Final Engineering Report (FER). Deviations from the on-Site RAWP will be fully explained in the FER. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from NYSDEC noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and,
- An approval process will be followed for changes/editions to the RAWP with basis that the remedial action with the deviation(s) is protective of public health and the environment.

## 5 ON-SITE REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

The demolition of the existing buildings will be completed prior to the approval of the RAWP; however, the buildings concrete slabs will be left in place until the start of soil excavation. A 60-day advance notification change of use is required prior to demolition.

The removal of materials from the Site will include removal of the former buildings and concrete foundation slabs and contaminated soil beneath the slabs: It is estimated that approximately 400 tons (\_258\_\_\_ cubic yards) of contaminated soil will be removed from the Site as part of the remedy and disposed of at a facility licensed to accept such material.

## 5.1 Excavation

Excavation and off-site disposal of soils from the Site which exceed the RR SCO for PCE and other applicable Restricted Residential (RR) SCOs in the upper 15 feet across the site, listed in 6NYCRR Part 375-6, Table 375-6.8(b) will be completed as part of the Remedial Action. Refer to **Plate 8** for a Remedial Excavation Map.

Unsaturated soil with the highest detected PCE concentrations, SB-4, SB-4W and SB-4N and SB-1N, SB-1S and SB-1E, comprising the hot spot areas on Lot 5 will be excavated to 8 fbg. The hot spot area excavations will be excavated to the respective surrounding delineation borings in all directions which provides for removal of additional soil with PCE concentrations exceeding the RR SCO but at lower concentrations than at the respective hot spot areas.

Additional soil will be removed to support the redevelopment of the Site. Soil and materials management on-Site and off-Site will be conducted in accordance with the SMP as described below.

## 5.2 Soil Cleanup Objectives

The remedy selected for this Site includes Track 2 cleanup to comply with the RR SCOs, as applicable, listed in 6NYCRR Part 375-6, Table 375-6.8(b). The SCOs are protective of human health and the environment and are justified based on the planned remedial activities and future Site use. Excavation in the hotspot areas will extend until clean endpoint confirmation samples meeting RR SCOs are achieved.

A soil analytical results map that shows the current and historical soil samples that exceed the SCOs proposed for this Remedial Action are shown in Plate 4.

#### 5.3 On-Site Remedial Performance Evaluation

Performance of the Track 2 on-Site Remedial Action with respect to soil must demonstrate CVOCs meet RR SCOs and

verify the effectiveness of ECs to mitigate vapors from entering indoor air at the proposed building. Documentation

samples will be used to verify soil conditions across the remainder of the Site. End-point sampling and reporting will

be conducted in accordance with DER-10 and the Site-specific QAPP.

Confirmation soil samples will be collected to confirm that the SCOs for CVOCs in soil have been met following

implementation of the on-Site Remedial Action. Documentation samples indicate the quality of soil remaining after

the completion of the on-Site Remedial Action.

Prior to the on-Site remedial construction, the Remedial Engineer will review all engineering drawings and details,

import material specifications (if applicable), and import soil quality data (if applicable) to confirm compliance with

this RAWP.

5.3.1 End Point Sampling Frequency

Post-Remediation Confirmation Sampling

Confirmatory endpoint samples for contaminated soil at SB-1 and SB-4 will be completed at a frequency as directed by

DER-10. To confirm the performance of the remedy with respect to soil meeting the RR SCO for chlorinated solvents,

confirmation soil samples will be collected for laboratory analysis of NYCRR Part 375 VOCs by USEPA Method 8260,

SVOCs by USEPA Method 8270, metals by USEPA Method 6010, pesticides by USEPA Method 8081, PCBs by USEPA

Method 8082A parameters from the excavation termination areas, as applicable.

Soil samples will be collected from side walls of the excavation at one soil sample per sidewall (expected to be less

than 30 linear feet each sidewall), and one bottom excavation sample will be collected at one per 900 square feet. Soil

samples will be collected from within the excavation sidewalls vertically at intervals where the previous exceedances

were identified or as identified by field screening.

The side wall confirmation soil sample collection locations will be biased to intervals where the highest PCE

concentrations were detected during the RI and/or field screening of soil samples during excavation. The collection of

these sidewall samples can be used as an indicator as to whether off-Site migration to the north and/other directions

has occurred. Confirmation bottom soil samples will be collected from overburden soil at the terminal excavation

depth of 8 fbg. Refer to **Plate 9** for a sample location map.

5.3.2 Methodology

Each new sample will be inspected for visual evidence of contamination (i.e., staining, presence of petroleum or odors)

and field screened for VOCs using a PID. Soil samples to be submitted for analysis will be placed in a laboratory sample

jar and transported to the laboratory in an iced container.

# 5.3.3 Reporting of Results

The laboratory will report analytical results for end-point samples in ASP Category B deliverable packages. An electronic data deliverable (EDD) in the required NYSDEC format will also be provided by the laboratory. All end-point sample data generated for the on-Site Remedial Action will be logged in a database and organized to facilitate data review and evaluation. The electronic dataset will include the data flags provided in accordance with USEPA Laboratory Data Validation Functional Guidelines for Evaluating Organic Analysis and Inorganic Analyses, as well as additional comments of the data review for ASP/CLP analyses. The data flags include such items as: 1) concentration below required detection limit, 2) estimated concentration due to poor recovery below required detection limit, 3) estimated concentration due to poor spike recovery, and 4) concentration of chemical also found in laboratory blank.

# 5.3.4 Quality Assurance and Quality Control

QA/QC samples serve as checks on both the sampling and measurements systems and assist in determining the overall data quality with regard to representation, accuracy, and precision. The QAPP, provided as Appendix E, describes QA/QC procedures and sampling for the project.

## 5.3.5 Data Usability Summary Report

A Data Usability Summary Report (DUSR) will be prepared to evaluate the end-point samples by a party independent from the laboratory performing the analysis and the project team in accordance with Appendix 2B of DER 10. The QAPP, provided as Appendix E, describes the DUSR to be prepared for the project. DUSRs for existing samples to be used as confirmation and/or documentation samples are provided in Appendix B of the RIR.

# 5.3.6 Reporting of End-Point Data in FER

The environmental laboratories used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified. End-point sampling frequency is described in Section 5.3.1. The FER will provide a tabular summary of the results of all documentation samples and map summary of the exceedances of SCOs. The report will provide a tabular summary of the results of all confirmation samples and map summary of the exceedances of SCOs, along with an evaluation of the contaminant mass removed from the source area. This data will also be reported in the subsequent FER.

## 5.4 Estimated Material Removal Quantities

The removal of materials from the Site will include: 1) removal and off-site disposal of general construction debris; 2) excavation and off-site disposal of soil to comply with applicable SCOs; and 3) excavation for building foundation elements; 4) removal of building foundation elements associated with the former demolished buildings from the subsurface as applicable; and 5) hot-spot area excavation. It is estimated that approximately 400 tons (258 cubic yards)

of soil from hot-spots will be removed as part of the remedy, with an additional 5,400 tons of soil generated from new building construction (items 1-4 above).

## 5.5 Soils/Materials Management Plan

The following sections provide the SMMP, which will be implemented during the on-Site Remedial Action.

# 5.5.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field scientist under the direction of the Remedial Engineer during all remedial and development (if any) excavations into known or potentially contaminated material. 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 phase and development (if any), such as excavations for utility work, prior to issuance of the Certificate of Completion.

## 5.5.2 Temporary Soil Staging Methods

Although direct-loading of trucks will be performed to the extent practical, excavated soil may be stored as temporarily stockpiles or in roll-off containers. Stockpiles if any, 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 lined and covered with polyethylene sheeting and continuously encircled with silt fences or hay bales (except where material is being loaded or removed). Hay bales or inlet protection covers will be used as needed near catch basins and other discharge points. Water will be available on-Site at suitable supply and pressure for use in dust control. Roll-off containers will be covered. If wet soil is encountered, roll-offs will be lined.

## 5.5.4 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 are as follows:

### **Inbound from Van Wyck Expy:**

- Head southeast on Van Wyck Expy toward 107<sup>th</sup> avenue
- Take ramp on left for I 678 South and head toward Kennedy Airport at exit 1-1E, head left on the ramp for NY -27 East/NY-878 East toward Eastern Long Island
- Turn right onto Central Ave.
- Turn right on Mott Ave., then immediately turn right onto Redfern Ave.
- Site will be on the left.

BCD Owner LLC NYSDEC BCP #C241254 – Draft Remedial Action Work Plan 13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

#### Outbound from Site:

- Leave site and turn left onto Redfern Avenue
- Turn left onto Doughty Blvd.
- Turn right onto Bayview Avenue
- Turn left onto NY 878/NASSAU EXPRESSWAY
- Keep straight and get onto road
- Take ramp on the left and follow signs for I-678 North at exit 3, head right on the ramp for Van Wyck Expressway toward Linden Blvd
- Turn left on 109<sup>th</sup> Avenue
- Turn right onto 135<sup>th</sup> St.
- Turn right onto 105<sup>th</sup> Ave. then immediately turn right onto Van Wyck Expressway.

Proposed in-bound and out-bound truck routes to the Site are shown on Plate 7. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites to the extent practicable; (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; and (f) overall safety in transport; [(g) community input [where necessary]].

The Site is not large enough to allow the queuing of trucks on-Site in order to minimize off-Site disturbance. Off-Site queuing will be prohibited, and a solution will be established with transportation company. 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.

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.

# 5.5.5 Material Excavation and Load-Out, Transportation and Off-Site Disposal

The total estimated quantity of 400 tons (\_258\_\_ cubic yards) of soil is expected to be removed and disposed from hot-spots during implementation of the remedy, with an additional 5,400 ton related to new building construction. The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work, including the excavation and load-out of all excavated material.

The Volunteer and its contractors are solely responsible for safe performance of all invasive work, the structural integrity of excavations, and the stability of structures that may be affected by the excavations (e.g., sidewalks,

drainage structures, parking lot islands, electrical service, etc.). If necessary, SOE (e.g., trench boxes or other temporary

means) will be used to support the excavations).

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. Trucks

will be prohibited from stopping and idling in the neighborhood outside the project Site. Off-Site queuing will be

minimized to the extent practicable. Truck transport routes are as described in Section 4.2.5. All trucks loaded with

Site materials will exit the vicinity of the Site using only these approved truck routes.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of tracking soil off the 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.

The disposal locations will be determined prior to implementation of the on-Site Remedial Action and will be reported

to the NYSDEC Project Manager.

Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval. Material

that does not meet Track 1 UU SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part

360-15 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 completed disposal facility application for each receiving facility describing the material to be

disposed and requesting formal written acceptance of the material. This application will state that material to be

disposed is contaminated material generated at an environmental remediation Site in New York State. The application

will provide the project identity. The application 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.

The FER will include an accounting of the destination of all material removed from the Site during this on Site Remedial

Action, including excavated soil, solid waste, hazardous waste (if any), 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.

### 5.5.6 Materials Reuse On-Site

This section provides the details required for reuse of materials on-Site. The 'Reuse on-Site' means material that was originally derived from the Site will be reused on the Site as part of the remedy.

Soil originating on the Site may be reused on the site provided laboratory analysis of the soil demonstrates compliance with SCGs as detailed in DER-10 Table 5.4(e)4. Otherwise, soil will be disposed in a permitted treatment, storage or disposal facility. Procedure for determining if soil reuse is appropriate:

- The number of samples required to demonstrate compliance with SCGs is dependent on the volume of soil identified for reuse.
- Grab soil samples are required for VOC analysis by USEPA Method 8260, and discrete samples from 3 to 5 random locations from the volume of soil to be tested are composited for SVOCs by USEPA Method 8270, PCBs, organochlorine pesticides, TAL metals and PFAS compound analysis.
- Levels of contamination must not exceed the lower of the protection of groundwater and residential use levels.
- A summary table of the reuse analytical results compared to the Restricted Residential Use SCOs will be submitted to the NYSDEC for evaluation and approval.
- A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC project manager for review and approval prior to material reuse on the site. A copy of the form is presented in **Appendix J**.
- A pre-construction meeting with the construction contractor will determine the stockpile segregation, staging
  area for stockpiles and the size of stockpiles which will be submitted to the NYSDEC prior to commencement
  of excavation work at the Site.

The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-Site. The following also apply to material reuse on Site:

- Concrete crushing or processing on-Site is prohibited, unless NYSDEC has specifically approved on-site processing and reuse of acceptable demolition material.
- Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site.

Contaminated on-Site material, including historic fill and contaminated soil, removed for grading or other
purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface
utility lines. This will be expressed in the final Site Management Plan.

# 5.5.7 Fluids Management

Dewatering is not anticipated. If any are generated, liquids to be removed from the Site will be handled, transported, and disposed in accordance with applicable local, State, and Federal regulations.

#### 5.5.8 Demarcation

A demarcation layer or barrier will be placed to distinguish between clean soil and soil exceeding UUSCOs. Apart from hot-spot removal areas, the building foundation will serve as the demarcation layer, if necessary.

# 5.5.9 Backfill from Off-Site Sources

Materials proposed for import onto the Site will be approved by the Remedial Engineer and NYSDEC and will be in compliance with provisions in this RAWP prior to receipt at the Site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) may be brought in to establish the designed grades at the Site. Sampling of backfill material will be completed in accordance with the QAPP. Native material from a virgin quarry source with less than 10 % fines will not require sampling prior to use as backfill on the Site.

Select types of backfill may be imported to the site without sampling as described in Part 375 (i.e., virgin stone). If sampling is required, all imported soils will meet NYSDEC approved soil quality objectives for this Site. The NYSDEC-approved soil quality objectives for the on-Site Remedial Action are the lower of the PGW SCOs or the RR SCOs. Additionally, backfill imported to the Site will be tested for 1,4-dioxane and PFAS contamination in general conformance with DER-10, Section 5.4(e). Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on Synthetic Precipitation Leaching Procedure (SPLP) testing, for example. If, based on SPLP testing, the concentrations of PFOA and PFOS in leachate are at or above 10 ppt, then the soil is not acceptable. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site without prior approval by NYSDEC.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360 (i.e., soils from another construction Site outside of New York City), but do not meet backfill objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC.

### 5.5.10 Erosion and Sediment Controls

- Barriers and hay bale checks will be installed and inspected once a 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. All necessary repairs shall be made immediately.
- Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.
- All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.
- Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.
- Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.
- Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

## 5.5.11 Contingency Plan

In the unlikely event that USTs or other previously unidentified contaminant sources are found during on-Site remedial excavation, sampling will be performed on surrounding soils and collected from sidewalls and excavation bottoms. Chemical analytical work will be for full scan parameters (TAL metals, TCL VOCs and SVOCs, TCL pesticides, PCBs, and PFAS "emerging contaminants"). These analyses will not be limited to CP-51/Soil Cleanup Guidance parameters where tanks are identified without prior approval by NYSDEC.

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 reports.

## 5.5.12 Community Air Monitoring Plan

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed 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, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while

opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a

sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be

performed 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. Exceedances of action levels

observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the NYSDEC Project

Manager and included in the Daily Report.

**VOC Monitoring, Response Levels, and Actions** 

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e.,

the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start

of each workday and periodically thereafter to establish background conditions. The monitoring work will be

performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The

equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The

equipment will 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 will be temporarily

halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below

5 ppm over background, work activities will 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 will be halted, the source of vapors identified,

corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will 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 will be shutdown.

All 15-minute readings must be recorded and be available for NYSDEC personnel to review. Instantaneous readings, if

any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion

zone at temporary particulate monitoring stations. The particulate monitoring will 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 will 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/m3) greater than background

(upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust

suppression techniques will be employed. Work will continue with dust suppression techniques provided that

downwind PM-10 particulate levels do not exceed 150 mcg/m3 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/m3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume

provided that dust suppression measures and other controls are successful in reducing the downwind PM-10

particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC personnel to review.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the

Daily Report.

5.5.13 Odor, Dust and Nuisance Control Plan

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 on-Site Remedial Action Work Plan."

5.5.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to

be used on a routine basis will include wetting the Site down with available water supply. 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

Volunteer's Remedial 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; [add other elements as appropriate]. 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 odorants 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 by sheltering excavation and handling areas under tented containment structures equipped

with appropriate air venting/filtering systems.

5.5.13.2 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 and will comply with NYSDEC DER-10 Appendix 1B - Fugitive Dust Control:

Dust suppression will be achieved through applying water on haul roads; wetting equipment and excavation faces;

spraying water on buckets during excavation and dumping; hauling materials in properly tarped or watertight

containers; restricting vehicle speeds to 10 mph; covering excavated areas and material after excavation activity

ceases; and reducing the excavation size.

5.5.13.3 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 NYCDEP noise control standards.

## 6 REMAINING CONTAMINATION ON-SITE

Since remaining soil vapor and groundwater contamination will exist beneath the Site after the remedy is complete, ECs and ICs are required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of remaining contamination will be implemented under a Site-specific SMP that will be developed and approved by NYSDEC and NYSDOH.

#### Groundwater

In-situ groundwater treatment injections will be performed along the south perimeter of Lot 5 to create a PRB to inhibit and treat dissolved-phase PCE migrating onto the Site from off-site sources to south. As a result, the insitu treatment is likely to reduce the toxicity, mobility, and volume of impacts to groundwater. Therefore, there is the potential for residual CVOC groundwater contamination to remain below the Site.

#### Soil Vapor

While hot-spot contamination removal and mitigation measures on-Site will eliminate the concentration of CVOC in soils on site, soil vapor conditions will remain resultant due to the off-site migration of vapors.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have three (3) primary EC systems. These are:

- A SSDS will be installed beneath the new building to mitigate potential vapor intrusion.
- An SVE system will be installed on the southern portion of the Site to capture and treat and prevent migration of residual contaminants present in unsaturated soil that could not be excavated during the remedy, if warranted. The requirement for SVE will be evaluated by after remedial excavation by conducting an additional soil vapor samples and pilot testing. If required, a separate Design Document and Work Plan for implementation of the SVE component will be submitted (refer to Plate 10 for the conceptual SVE System location). If subsequent soil vapor sampling demonstrates that the SVE system is no longer needed, an Explanation of Significant Difference and RAWP amendment will be submitted to the NYSDEC and NYSDOH.

The FER will report residual contamination, if any, on the Site in tabular and map form. This will include presentation of exceedances of both Track 1 SCOs and Track 2 SCOs sites.

## 7 IN-SITU GROUNDWATER TREATMENT

# 7.1 In-Situ Groundwater Treatment and Efficacy

An in-situ permeable reactive barrier (PRB) will be installed to impede migration from off-site source(s) and treat the dissolved-phase CVOC contaminant mass onto the Site at the southern property boundary. The PRB selected application is two-fold and will include the application of PlumeStop® Liquid Activated Carbon™ (PlumeStop) and Sulfidated-MicroZVI® (S-MZVI) to treat residual chlorinated solvents. PlumeStop is a colloidal form of activated carbon with a surface treatment which reduces its interactions with the soil matrix. This allows it to move through soil pores leaving a coating on the soil matrix as it distributes from the injection point. This provides a very large sorption surface which will result in immediate reduction of these contaminants while concentrating contaminants to allow for more efficient and controlled remediation through destructive technologies like S-MZVI. S-MZVI is a concentrated aqueous suspension of sulfidated, colloidal zero valent iron formulated for compatibility with PlumeStop. When applied to the subsurface it imparts an in-situ chemical reduction (ISCR) mechanism that allows for the destruction of chlorinated ethenes (i.e. PCE, TCE) via abiotic degradation pathways. This mechanism allows for the traditional reduction pathway to be circumvented, minimizing the formation of daughter species such as vinyl chloride. Sulfidation blocks the effects of water on the ZVI particles, allowing the reagent to be effectively focused on the chemical reduction of chlorinated ethenes. As contaminants are degraded to non-toxic and non-sorptive end products, the PlumeStop sorption surface will be regenerated. This allows for further sorption and treatment of contaminants that may diffuse back into the groundwater from the soil matrix over time. Refer to Plate 11 for the proposed injection point and PRB location.

Approximately 22 injection point locations will be utilized to deliver the product to the groundwater table. The top of the application will be approximately 16-fbg, and the bottom of the application zone will be approximately 26-fbg, for a ten-foot treatment zone. The perpendicular extent of the injection row will be approximately 130-linear feet. Approximately 444-gallons of PlumeStop and 60-gallons of S-MZVI will be mixed with approximately 9,143-gallons of water, and of that mixture, approximately 439-gallons will be delivered to each of the 22 injection points. Refer to **Appendix G** for Target Treatment Zone (TTZ) information and Application Design Summary.

Once installed, contaminant concentrations in saturated soil and groundwater in contact with the PRB are adsorbed onto the regenerative carbon substrate where both aerobic and anaerobic biodegradation is enhanced. The enhanced biodegradation of contaminants within the biomatrix regenerates or frees up sorption sites allowing contaminants to further partition out of the groundwater. This allows a single application of the above reagents to remain functional for an extended/indefinite period of time.

## 7.2 In-Situ Treatment Performance Evaluation

Four rounds of post-treatment synoptic groundwater gauging and sampling will be performed to confirm effectiveness of the PRB. Groundwater monitoring well samples will be collected for laboratory analysis of VOCs via USEPA 8260. Subsequent

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groundwater monitoring requirements after the initial four (4) rounds will be determined in consultation with the NYSDEC. The remedial goal is to document complete cut-off of the off-site source and enhanced natural attenuation of groundwater contamination. The data generated from the groundwater sampling will be used to evaluate post-excavation and post-treatment conditions and establish dissolved-phase contaminant trends over time. A minimum of four (4) rounds of sampling over a period of one year is anticipated.

# 8 ENGINEERING CONTROLS

## 8.1 Sub Slab Depressurization System

Although significant residual soil vapor is not anticipated post excavation of the On-Site Hot Spot areas, the potential for soil vapor intrusion has been evaluated by pilot testing and the collection of vapor samples for laboratory analysis. The results of the soil vapor investigation indicate the necessity for installation of an active SSDS beneath the building slab to reduce contaminated soil vapor and mobility and mitigate exposure to residual contaminated soil vapor. A required sealing layer in the form of a vapor barrier will be installed beneath the building slab and on the exterior of foundation walls. Specifications for a vapor barrier and SSDS are provided in the **Appendix F**.

#### Vapor Barrier

Although not an element of the proposed remedy, a vapor barrier/waterproofing membrane will be installed as an element of foundation construction, and will consist of a Stego Industries branded Drago Wrap Vapor Intrusion Barrier 20-mil thick chemical resistant waterproofing membrane for horizontal applications beneath the building foundation slab and for vertical applications, outside the building footprint.

The Drago Wrap Vapor Intrusion Barrier waterproofing membrane lengths will be joined using manufacturer recommended sealant tape (for low temp and hot weather applications) with a minimum six-inch overlap between each section. The vapor barrier can be adhered to the vertical portions of the foundation walls using tape. Any penetrations in the membrane will be sealed using manufacturer recommended mastic or tape or other accessories.

The vapor barrier/waterproofing membrane will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls and will be installed in accordance with manufacturer specifications.

#### Sub-Slab Depressurization System

The SSDS would consist of 14 suction pit venting zones beneath the approximately 40,000 square foot building footprint in accordance with the USEPA Handbook for Sub-Slab Depressurization for Low-Permeability Fill Soils and ANSI/AARST Radon Mitigation Standards for Schools and Large Buildings which recommend a separate vent loop for every 2,00 to 4,000 square feet of the slab area. A SSDS would include the installation of vertical vapor extraction/collection pits within a continuous gravel envelope laid out beneath the foundation slab across the entire building footprint. The extraction points would be connected to transitional header piping on the first floor extending to four risers which will be installed to the roof. The gravel envelope surrounding each extraction point would be backfilled with clean, virgin mined ½ inch to ¾ inch gravel (e.g., bluestone) to grade beneath the vapor barrier which will act as a gas permeable layer. Risers would be extended to the roof through chase-way locations, and will extend at least 3-feet above the roof line. The active SSDS required will achieve a pressure differential of at least 0.02 inches

of water to provide an adequate saftey factor for long-term and seasonal vairation. The system will consist of in-line radon-style low flow fans fitted to the risers penetrating the roof line, and will be hardwired into the building's electrical system to prevent accidental shut off and maintain continuous operation. Durable pressure monitoring devices and alarms will be installed to indicate operational parameters (such as on/off or pressure indicators). These devices will be placed in readily visible, frequently trafficked locations within the structure and monitored regularly. The low flow fans are capable of moving up to 272 cubic feet per minute (cfm) of air. **Plate 13** through **Plate 13b** shows a proposed suction-pit SSDS layout and design details. Final design and specification for this system is reliant upon the results of the vacuum point readings collected from permanent monitoring points installed through the foundation slab. Additionally, air samples will be collected from each fan effluent after approximately 30-60 days of operation (once steady state conditions have been attained) and submitted for laboratory analysis fo VOCs by USEPS TO-15 to evaluate sub-slab removal rates and to verify air emissions are below *de minimis* coniditons. This EC will be inspected on an annual basis as part of the Site Management Plan (SMP).

## 8.2 Soil Vapor Extraction

Once the groundwater treatment and hot-spot excavation has been completed in the southern portion of the Site, it will be feasible to perform a supplemental SVI study to assess and design an SVE system to reduce concentrations of soil vapor on-Site that may result from the presence of PCE in groundwater. A blower will be attached to three (3) SVE wells on the southern portion of the Site to create a negative pressure gradient facilitating the removal of vapors from the soil, through the extraction wells, through a granulated activated carbon (GAC) unit, and finally, piped through an effluent stack where the resulting air is discharged to the atmosphere. The SVE wells will be piped either to the same chase as the SSDS or to a separate discharge point determined at a later time. The SVE system may consist of 3-inch diameter schedule 40 PVC extraction wells installed to the top of water with approximately 5 feet of slotted screen along the southern property boundary. A soil vapor extraction pilot study will be performed prior to mobilization for remediation. This data will be used to prepare a SVE system design document to be submitted to NYSDEC for approval and included as an Addendum to the RAWP.

## 9 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEMS

## 9.1 Sub-Slab Depressurization System

Operation of the active SSDS will not be discontinued without written approval by NYSDEC and NYSDOH. The vapor intrusion monitoring will include the collection of samples from the sub-slab of the proposed building and the indoor air in accordance with the NYSDOH Guidance or Evaluating Soil Vapor in the State of New York (October 2006) and the May 2017: Updates to Soil Vapor / Indoor Air Decision Matrices. A proposal to discontinue the SSDS would be submitted by the property owner based on confirmatory data that justifies such request. The SSDS is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity. The system will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

## 9.2 Soil Vapor Extraction

The SVE will be monitored for up to five years and may be terminated upon demonstration that soil vapor concentrations have achieved asymptotic concentrations. The monitoring will be described in an SMP. The SVE system will not be discontinued without written approval by NYSDEC and NYSDOH. Systems will remain in place and operational until permission to discontinue their use is granted in writing by NYSDEC and NYSDOH. These sampling/monitoring activities will adhere to stipulations outlined in the Monitoring Plan section of the SMP.

### 9.3 Groundwater Treatment

Groundwater monitoring activities to assess the performance of the remedy, or natural attenuation following the removal of on-site contaminant source, will continue, as determined by NYSDOH and NYSDEC, until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period. Monitoring will continue until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities will be outlined in the Monitoring Plan of the SMP. It is anticipated that, following remediation, a minimum of four quarterly monitoring events will be performed.

### 10 INSTITUTIONAL CONTROLS

After the remedy is complete, the Site may have residual contamination remaining in place. Engineering Controls (ECs) for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan.

All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER. A Site -specific Environmental Easement will be recorded with Queens County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

#### 10.1 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. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Queens County Office of the City Register. The recorded Environmental Easement will be submitted as part of the FER.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement:

- 1. Requires the remedial party or Site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- 2. Allows the continued use and development of the controlled property for restricted-residential (which allows for commercial and industrial uses) as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- 3. Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Article 141 of the NYCDOH code; and
- 4. Requires compliance with the Department approved SMP.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Queens County Office of the City Register 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 of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

#### The ICs that support ECs 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 ECs must be operated and maintained as specified in this SMP;
- All ECs on the Controlled Property must be inspected and certified at a frequency and in a manner 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, if any, must be protected and replaced as necessary to
  ensure proper functioning in the manner specified in the SMP; and
- ECs may not be discontinued without an amendment or extinguishment of the Environmental Easement.
- Adherence to these ICs for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property will also have a series of ICs in the form of Site restrictions and requirements. The restrictions that apply to the Controlled Property are:
- Vegetable gardens and farming on the Controlled Property are prohibited, with the exception of raised planters;
- 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 remaining 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 commercial use (and industrial uses defined in 6 NYCRR Part 375) only, provided the long-term ECs and ICs included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as restricted residential, residential, or unrestricted use without an amendment or extinguishment of this Environmental Easement; and
- 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 in order 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 annual statement must be certified by an expert that the NYSDEC finds acceptable.

## 10.2 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The Site Management Plan is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The Volunteer property owner is responsible to ensure 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 residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery

systems; and (4) 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 DER-10 Technical

Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The

certification period will be annually. The Periodic Review Report will be based on the certifying period relative to the

date of issuance of the COC. The first submission will be due 16 months after the issuance of the COC, and annually

thereafter.

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual

contaminated material will be subject to provisions contained in the SMP.

## 11 FINAL ENGINEERING REPORT

An FER will be submitted to NYSDEC following implementation of the on-Site Remedial Action defined in this RAWP. The FER provides the documentation that the on-Site remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will include as-built drawings for all constructed elements, certifications, manifests, and bills of lading. The FER will provide a description of the deviations in the on-Site Remedial Action from the elements provided in the RAWP. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site. The FER will provide a tabular summary of all material characterization results and other sampling and chemical analysis performed as part of the on-Site Remedial Action (if any). The FER will be prepared in conformance with DER 10.

The FER will include written and photographic documentation of all remedial work performed under the on-Site Remedial Action.

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

The FER will provide a thorough summary of all remaining contamination that exceeds the SCOs defined for the Site in the RIR/RAWP and must provide an explanation for why the material was not removed as part of the on-Site Remedial Action. A table that shows remaining contamination in excess of Site SCOs and a map that shows remaining 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 an FER and issuance of a Certificate of Completion, all project reports must be submitted in the NYSDECs standardized EDD format.

#### 11.1 Certifications

The following certification will appear in front of the Executive Summary of the FER. The certification will be signed by the Professional Engineer, Xin Yuan, who is a Professional Engineer registered in New York State Thw certification will be appropriately signed and stamped. The certification will include the following statements:

I, [PE name], certify that I am currently registered professional engineer licensed by the State of New York. I

had primary direct responsibility for the implementation of the subject construction program for the [Site

name] Site (NYSDEC BCA Index No. Wx-xxxx-xx-xx Site No. Cxxxxxx).

I certify that the Site description presented in this FER is identical to the Site descriptions presented in the

Environmental Easement, the Site Management Plan, and the Brownfield Cleanup Agreement for [Site name]

and related amendments.

I certify that the Remedial Action Work Plan dated [month day year] and Stipulations [if any] in a letter dated

[month day year] and approved by the NYSDEC were implemented and that all requirements in those

documents have been substantively complied with.

I certify that the remedial activities were observed by qualified environmental professionals under my

supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other

relevant provisions of ECL 27-1419 have been achieved.

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. 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 the NYSDEC.* 

I certify that the export of all contaminated soil, fill, water or other material from the property was

performed in accordance with the Remedial Action Work Plan, and were taken to facilities licensed to accept

this material in full compliance with all Federal, State and local laws.

I certify that all import of soils from off-Site, including source approval and sampling, has been performed

in a manner that is consistent with the methodology defined in the Remedial Action Work Plan.

I certify that all invasive work during the remediation and all invasive development work were conducted in

accordance with dust and odor suppression methodology and soil screening methodology defined in the

Remedial Action Work Plan.

BCD Owner LLC NYSDEC BCP #C241254 – Draft Remedial Action Work Plan 13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, New York

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

It is a violation of Article 145 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 145, New York State Education Law.

### 12 SCHEDULE

A schedule for performance of the remedial work is as follows:

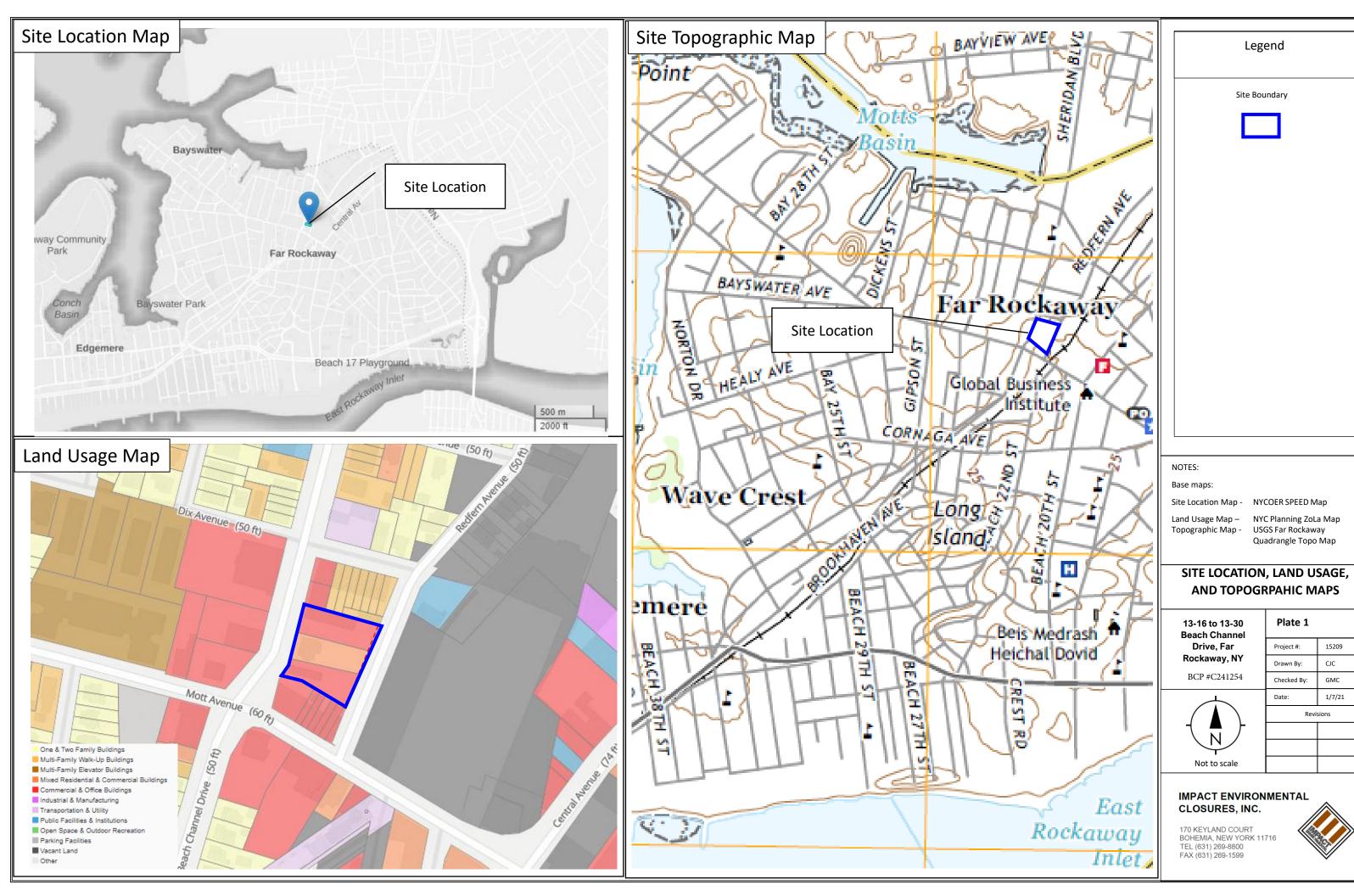
| ACTIVITY DESCRIPTION  | ESIMATED DATE                 |
|---|-------------------------------|
| Groundwater Treatment Application of PlumeStop® Liquid Activated Carbon™ (PlumeStop) and Sulfidated-MicroZVI® | June 2022                     |
| Construction Mobilization   | May - June 2022               |
| Excavation of Hot Spot Areas SB-1 and SB-4  | June 2022                     |
| Supplemental Soil Vapor Intrusion Study   | August 2022                   |
| Foundation Excavation   | June 2022 – October 2022      |
| Installation of SSDS Pits (During Foundation Work)  | September 2022 – October 2022 |
| Installation of Sub-Slab Drago® Wrap Vapor Barrier System   | September 2022 – October 2022 |
| Installation of SSDS Riser Piping and Inline Fans (During Superstructure Build)                               | February - June 2023          |
| Soil Vapor Extraction System  | February – June 2023          |
| File Environmental Easement   | May 2023                      |
| Draft Site Management Plan  | August 2023                   |
| Draft Final Engineering Report  | August 2023                   |
| Receipt of Certificate of Completion  | December 2023                 |

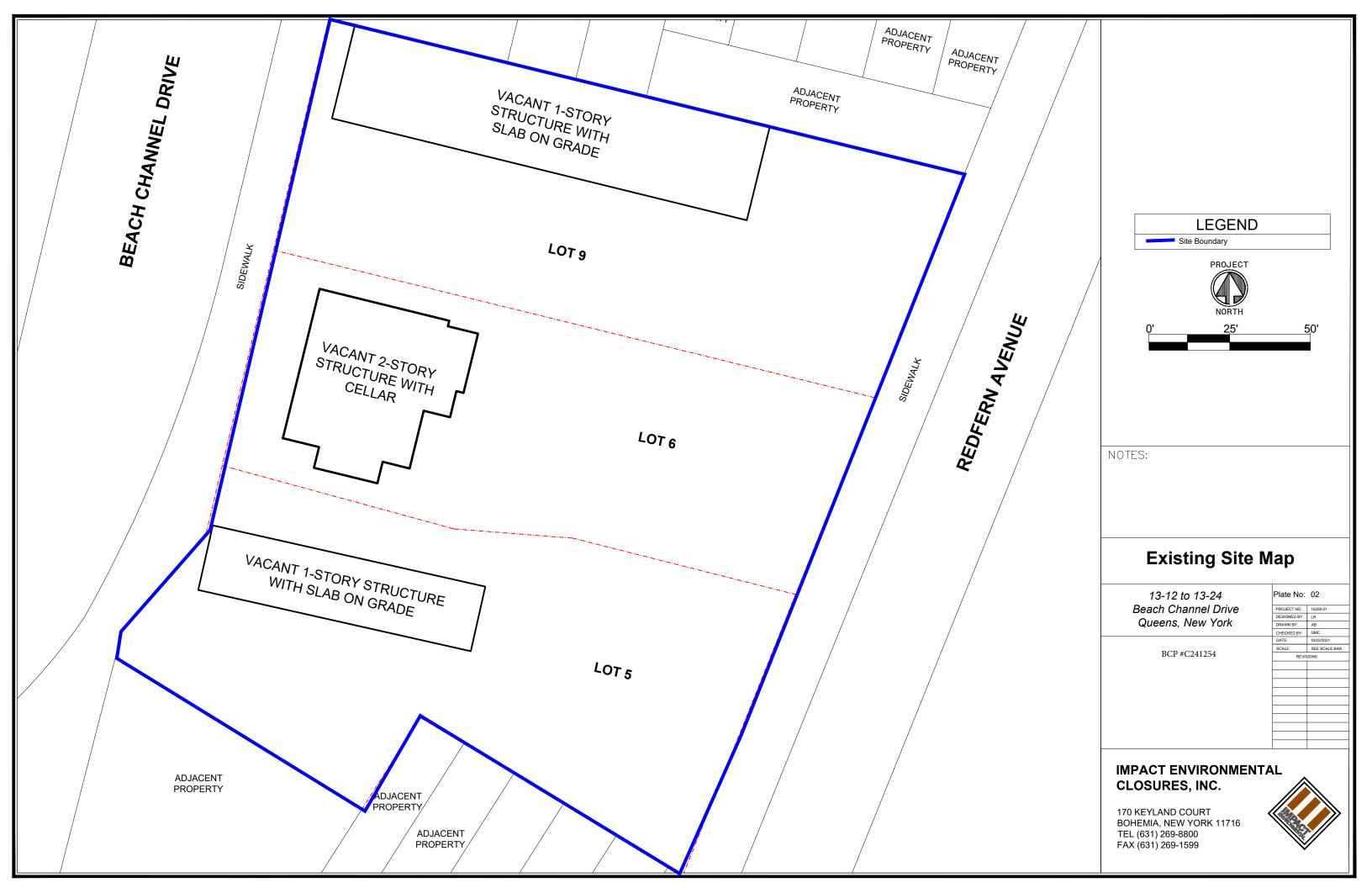
Refer to **Appendix I** for a Gantt chart of the projected construction schedule.

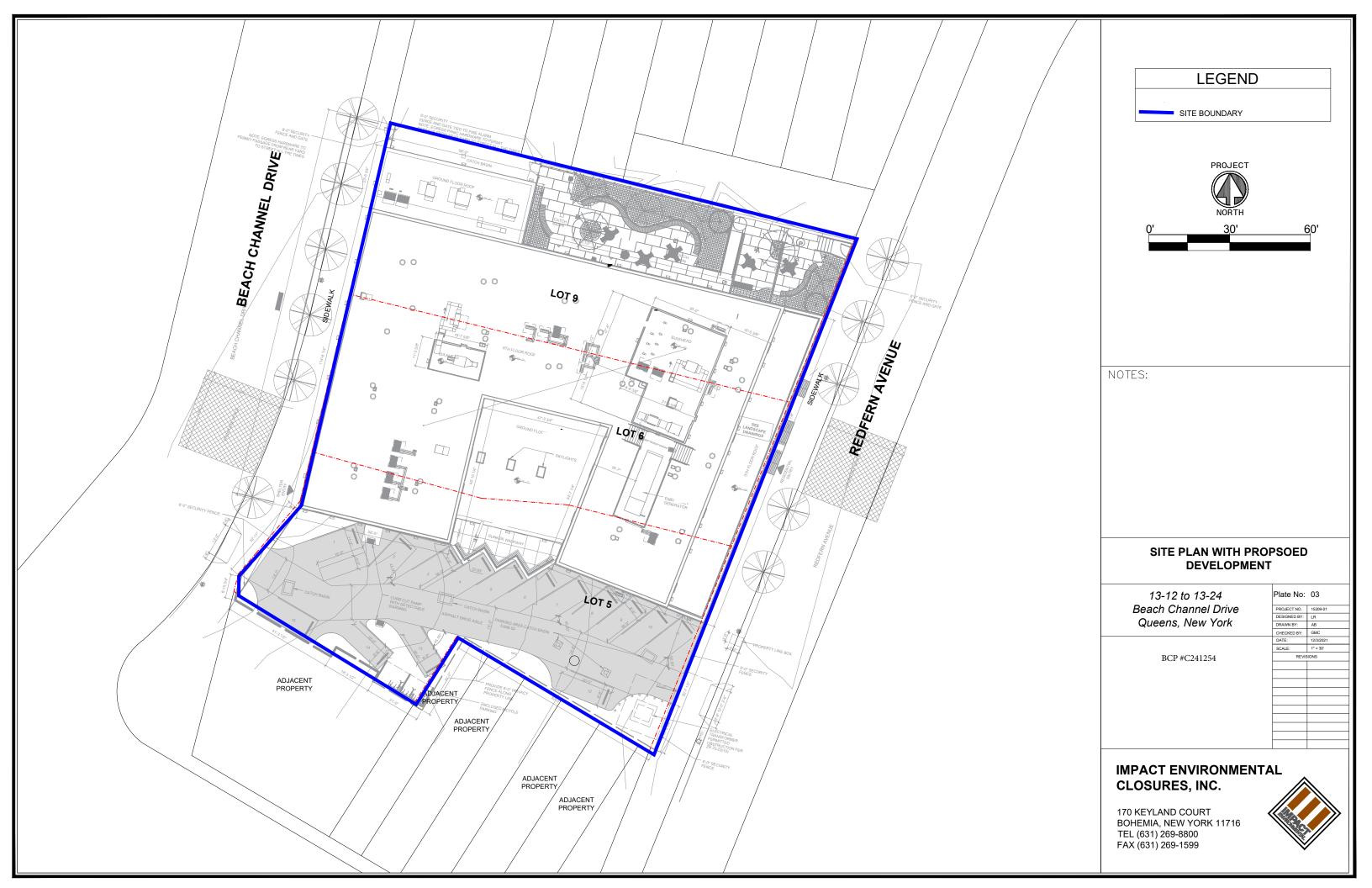
## **PLATES**

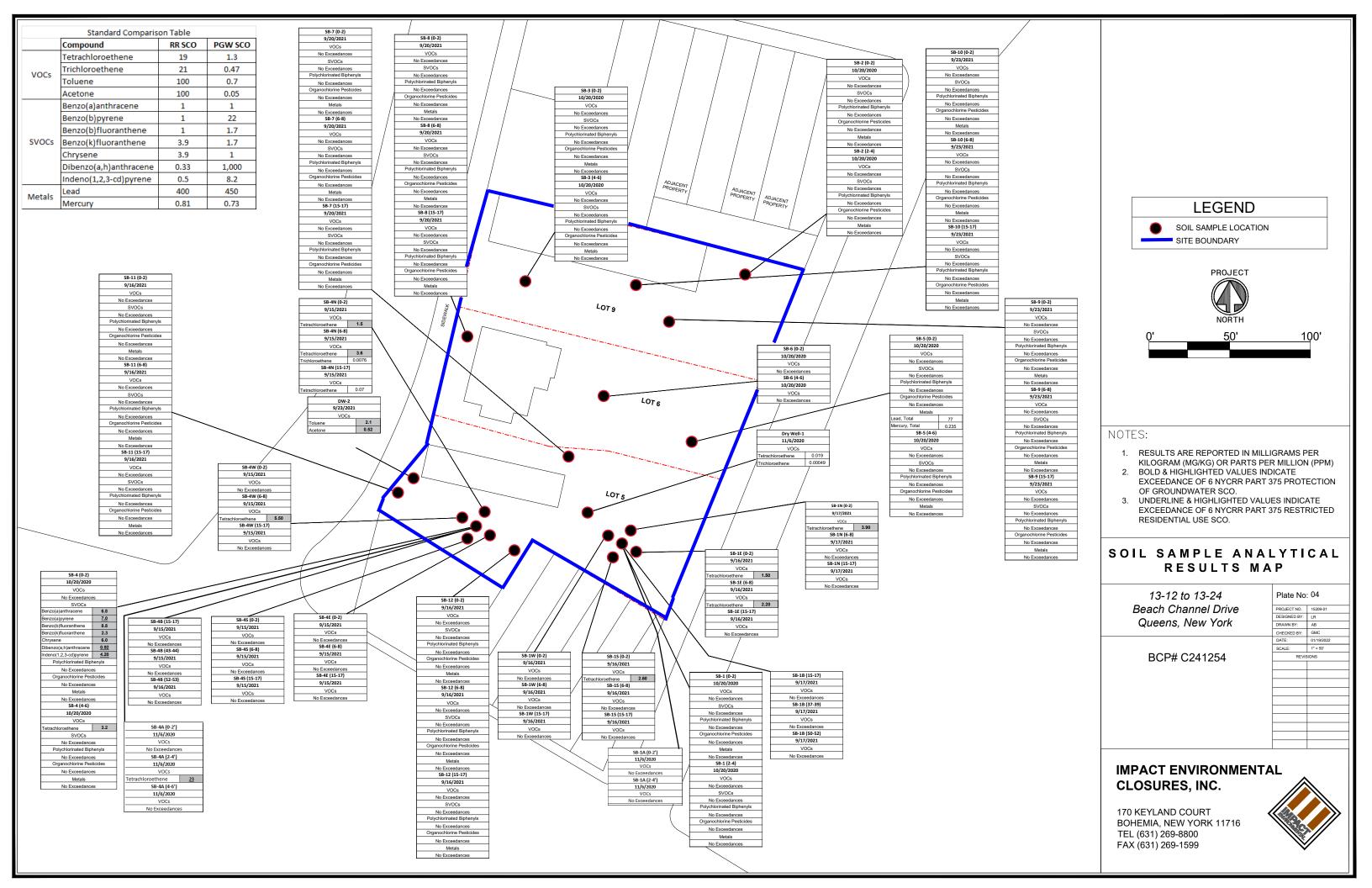
13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, NY

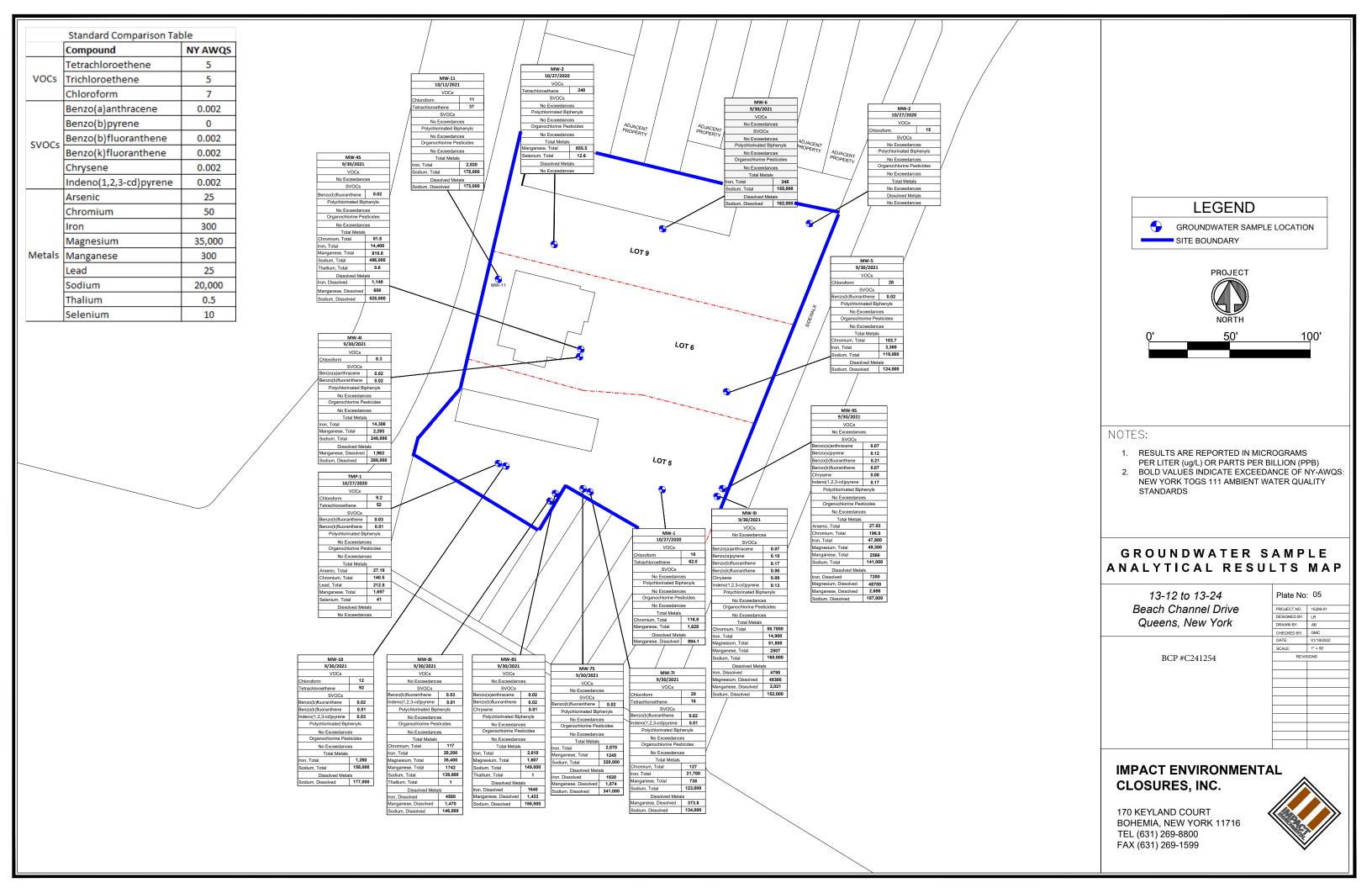






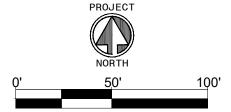








SOIL VAPOR SAMPLE LOCATION



| Analyte                | NYSDOH Decision<br>Matrix Minimum<br>Concentration |
|------------------------|--|
| Tetrachloroethene      | 100  |
| Trichloroethene        | 6  |
| cis-1,2-Dichloroethene | 6  |
| Vinyl Chloride         | 6  |

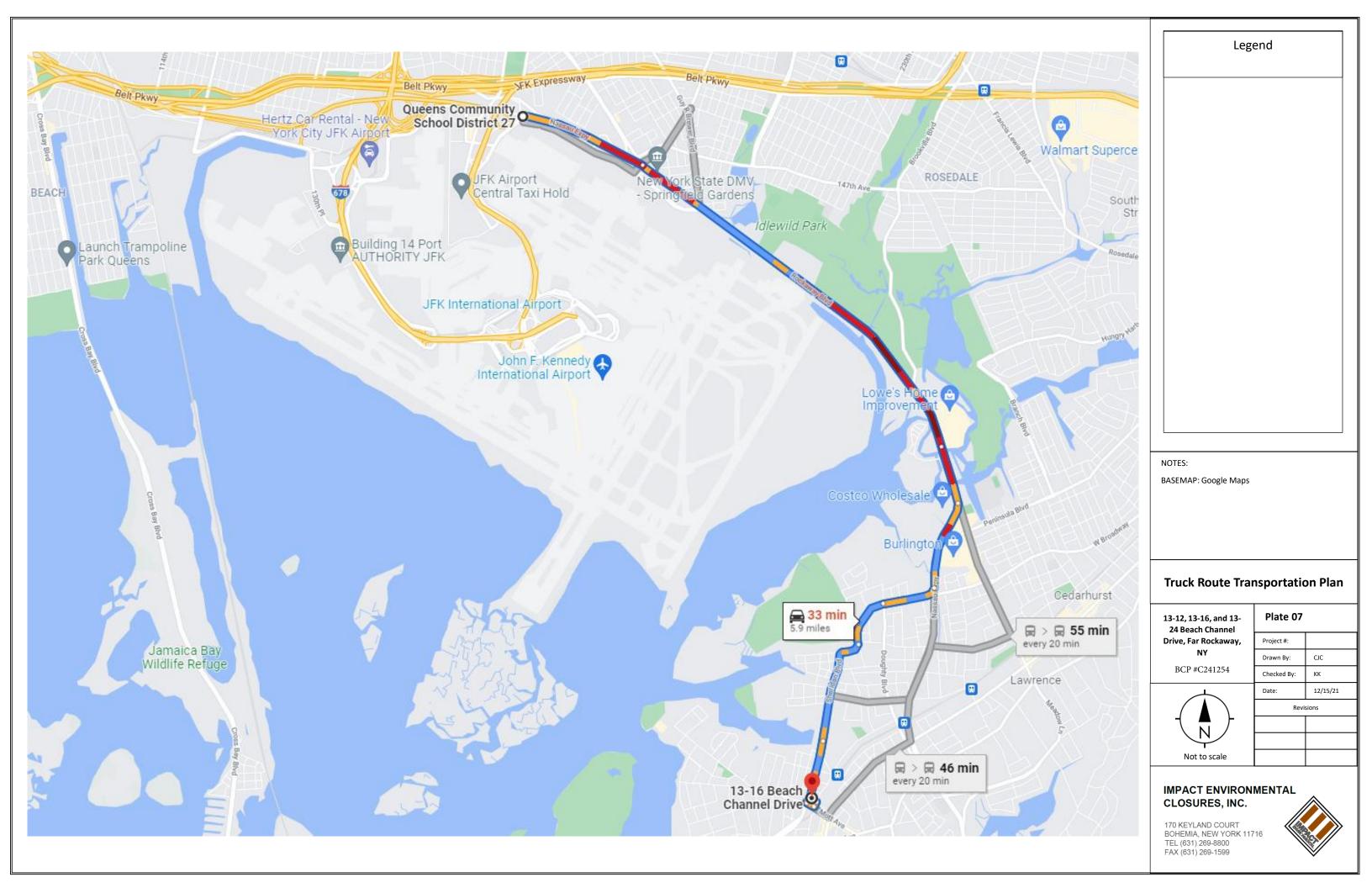
### SOIL VAPOR SAMPLE ANALYTICAL RESULTS MAP

PROJECT NO. 15209-01 DESIGNED BY: LR
DRAWN BY: AB CHECKED BY: GMC DATE: 01/19/2022 SCALE: 1" = 50'

Pate No: 06

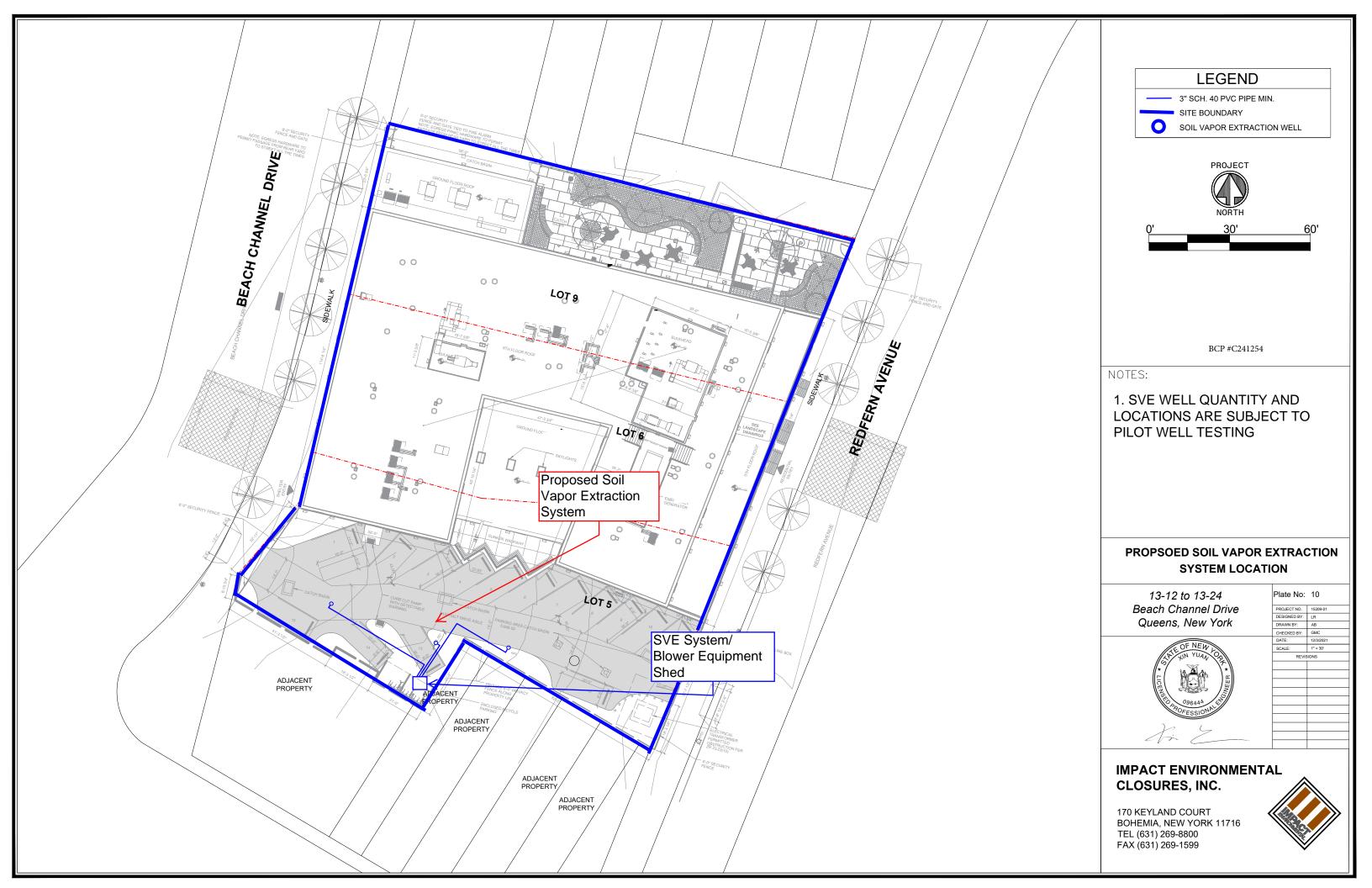
**IMPACT ENVIRONMENTAL** 

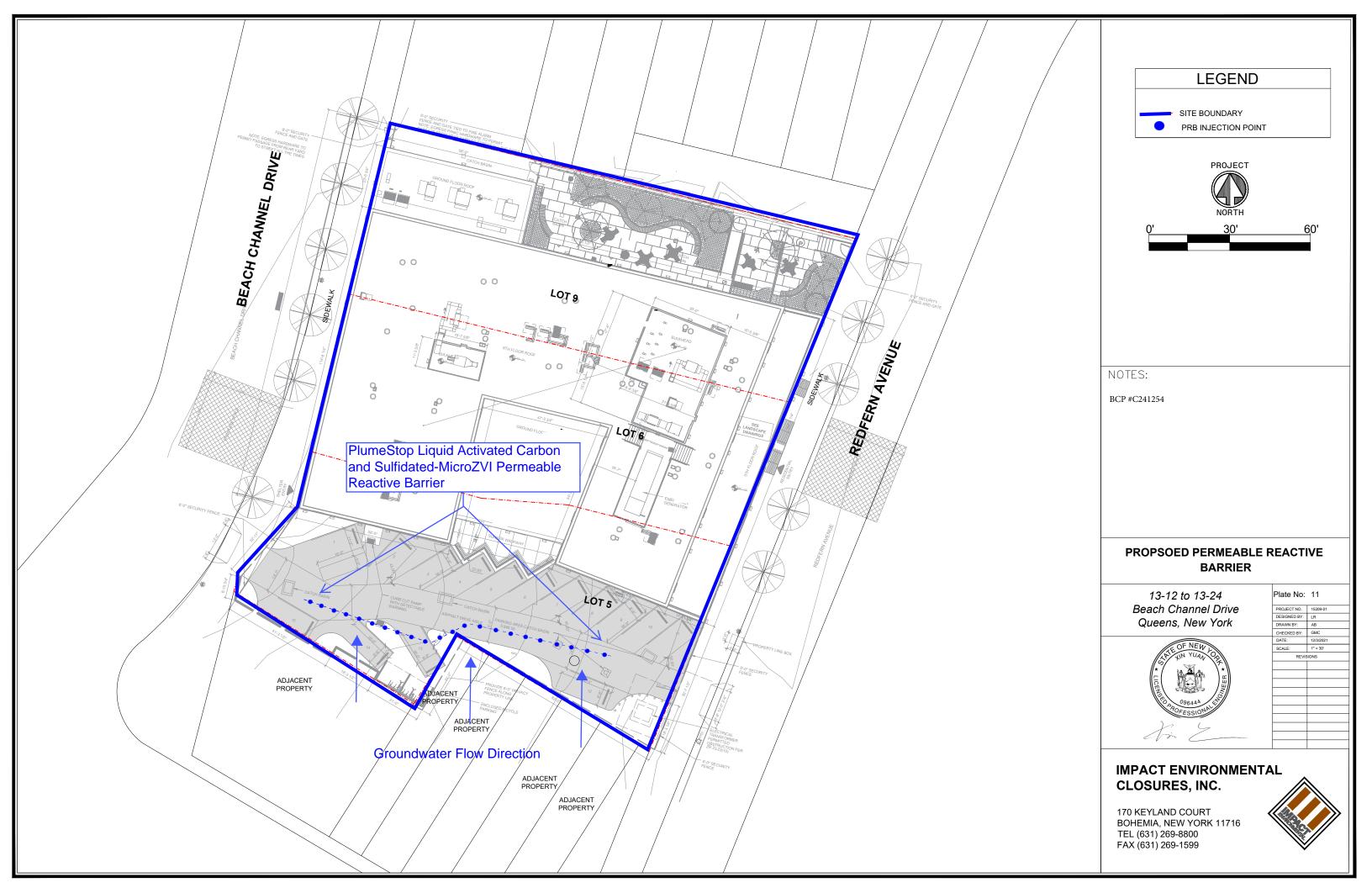




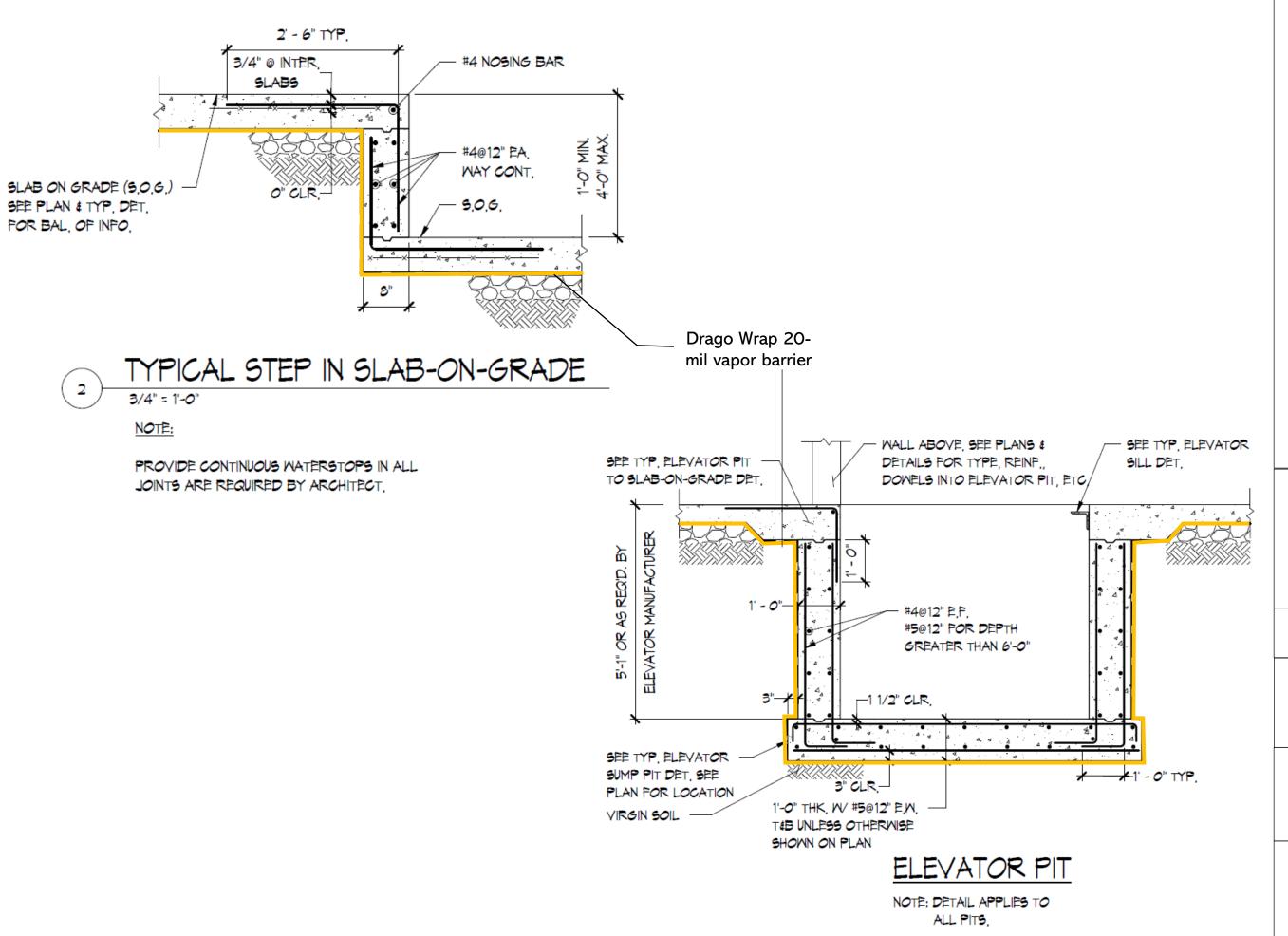


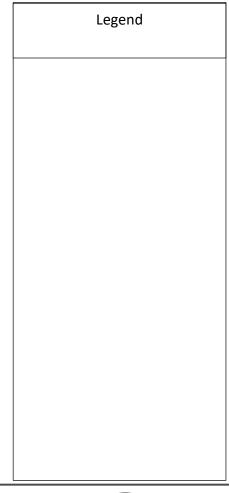












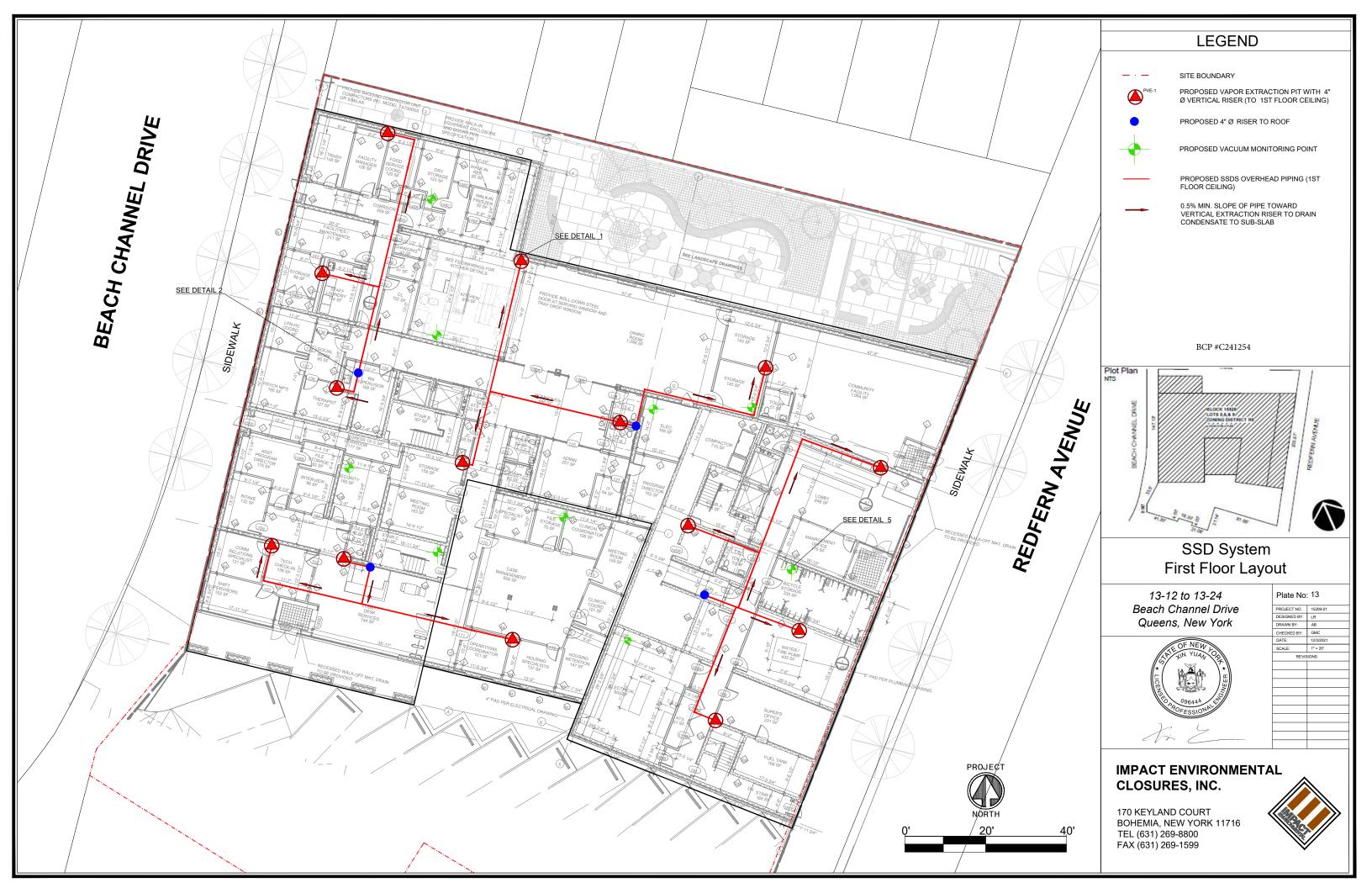


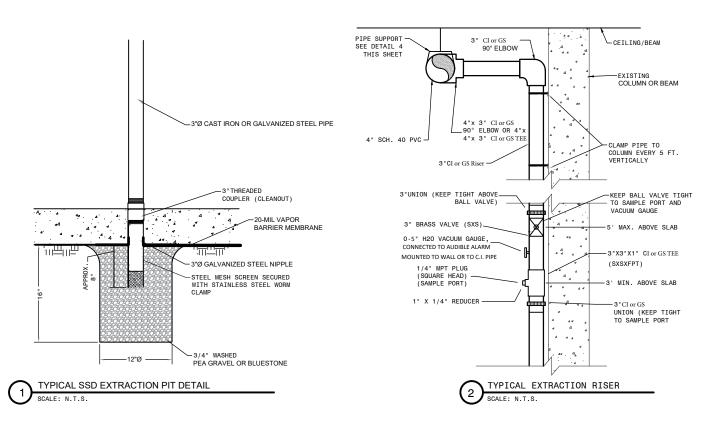
### Vapor Barrier Design Details

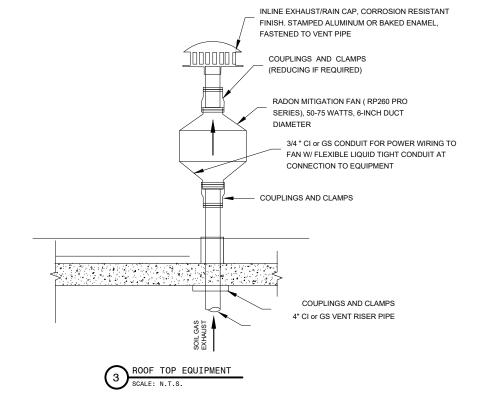
| 13-12, 13-16, and 13-<br>24 Beach Channel<br>Drive, Far Rockaway, | Plate 12a   |          |  |  |
|---|-------------|----------|--|--|
|   | Project #:  |          |  |  |
| NY  | Drawn By:   | CJC      |  |  |
| BCP #C241254  | Checked By: | KK       |  |  |
|   | Date:       | 12/15/21 |  |  |
|   | Revisions   |          |  |  |
|   |             |          |  |  |
|   |             |          |  |  |
| Not to scale  |             |          |  |  |

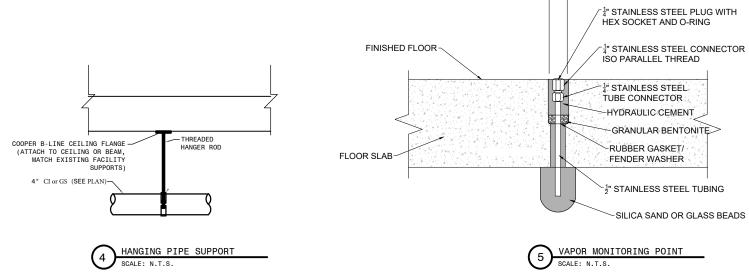
IMPACT ENVIRONMENTAL CLOSURES, INC.

170 KEYLAND COURT BOHEMIA, NEW YORK 11716 TEL (631) 269-8800 FAX (631) 269-1599









BCP #C241254

**LEGEND** 

### SUB-SLAB DEPRESSURIZATION SYSTEM DETAIL

13-12 to 13-24 Beach Channel Drive Queens, New York

Plot Plan



DRAWN BY: AB CHECKED BY: GMC SCALE: 1" = 20'

Plate No: 13a

### IMPACT ENVIRONMENTAL CLOSURES, INC.

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1. HORIZONTAL PIPING SHALL BE SUPPORTED A MINIMUM OF EVERY 10 FEET.

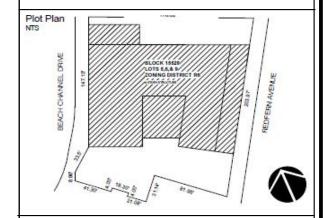
2. HORIZONTAL PIPING SHALL BE INSTALLED WITH 0.5% SLOPE TO FACILITATE DRAINAGE OF CONDENSATE.

- 1. PURPOSE
- THE INTENT OF THE SUB-SLAB DEPRESSURIZATION SYSTEM DESCRIBED IN THIS PLAN IS TO PROMOTE PUBLIC SAFETY AND WELFARE BY CONTROLLING SOIL GAS INTRUSION POTENTIALLY EMANATING FROM BENEATH THE BUILDING SUB GRADE. THE SYSTEM IS NOT INTENDED TO REGULATE FLAMMABLE VAPORS THAT MAY ORIGINATE IN AND PROPAGATE FROM OTHER SOURCES, WHICH INCLUDE, BUT ARE NOT LIMITED TO, RUPTURED HAZARDOUS MATERIAL TRANSMISSION LINES, UNDERGROUND ATMOSPHERIC TANKS, OR SIMILAR INSTALLATIONS.
- 2. THE CONTRACTOR SHALL SUPPLY ALL LABOR, EQUIPMENT AND MATERIALS TO COMPLETE THE SUB-SLAB EXTRACTION PITS, PIPING, MANIFOLDS, EQUIPMENT STAGING, REMEDIAL EQUIPMENT CONNECTIONS ACCORDING TO THE PLANS AND SPECIFICATION HEREIN.
- 3. THESE DRAWINGS WERE PRODUCDED FROM MAPS AND DRAWINGS COLLECTED FROM THE OWNER'S ARCHITECT. THE LOCATIONS OF FEATURES AND ONJECTS ARE APPROXIMATE. IT IS NOT INTENDED TO AN ACCURATE PROPERTY SURVEY.
- E. GENERAL REQUIREMENTS CODES:
  ALL WORK SHALL BE IN COMPLIANCE WITHE CURRENT
  BUILDING CODE AND POLICIES OF THE DEPARTMENT OF
  BUILDING AND ALL APPLICABLE COUNTY, STATE, AND
  FEDERAL CODES.
  INSPECTION:
- ALL WORK, REQUIRING INSPECTION BY THE DEPARTMENT OF BUILDING, SHALL BE AVAILABLE TO THE INSPECTOR PRIOR TO BEING COVERED BY SUBSEQUENT WORK.
- 5. MITIGATION REQUIREMENTS
  ALL VENTILATION SYSTEMS SHALL BE MAINTAINED AND
  SERVICED IN PROPER WORKING CONDITION AND MEET ALL
  REQUIREMENTS OF THE DEPARTMENT OF BUILDING CODE.
- 6. SUB-SLAB VENT SYSTEM CONSTRUCTION CRITERIA SUB-SLAB VENT SYSTEM SHALL CONSIST OF PERFORATED HORIZONTAL PIPES, GRAVEL BLANKET UNDER IMPERVIOUS MEMBRANE, GRAVEL AROUND PERFORATED HORIZONTAL PIPES AND VENT RISERS.
- 7. OWNER'S CONTRACTOR TO COMPLETE ALL PIPING INSTALLATION WORK FROM 2 FT. STUB-UPS PROVIDED AT FIRST FLOOR SLAB TO SSDS EQUIPMENT AT ROOF IN ACCORDANCEW WITH LOCAL, STATE AND FEDERAL CODES, REGULATIONS AND REQUIREMENTS.
- 8. OWNER'S ELECTRICAL CONTRACTOR TO COMPLETE ALL ELECTRICAL WORK NECESSARY TO SUPPLY POWER TO THE SSDS PRE-PACKAGED AND PRE-WIRED SYSTEMS STAGED AT ROOF, INCLUDING ALL ELECTRICAL CONNECTIONS IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL CODES, REGULATIONS AND REQUIREMENTS...

- GRAVEL TYPE AND THICKNESS:
   a. BEDDING MATERIAL AND EXTRACTION PIT MATERIAL SHALL BE 3/8-INCH BLUESTONE.
   b. EXTRACTION PITS MUST BE A MINIMUM OF 16-INCHES IN DEPTH BY 12-INCHES IN WIDTH.
   c. SUB-BAS EMATERIAL SHALL CONSIST OF SIMILAR MATERIAL AS THE EXTRACTION PITS.
- VENT RISER OUTLETS SHALL BE LOCATED AT LEAST:
   a. 10-FFET ABOVE GRADE
   b. 10 FEET AWAY FROM ANY WINDOW, DOORS, ROOF HATCH, OPENING OR AIR INTAKE INTO THE BUILDING.
   c. 3 FEET ABOVE HIGHEST POINT OF ROOF
- 3. LABELING PIPE AND EQUIPMENT:
  a. LABEL ALL RADON DUCT (C.I. PIPE) CONTINUOUSLY.
  LABEL TO READ "CAUTION SUB—SLAB
  DEPRESSURIZATION SYSTEM. DO NOT CONNECT ANY
  OTHER SERVICE"
  b. LABEL RADON FAN, LABEL TO READ: "CAUTION THIS IS
  A COMPONENT OF A SUB-SLAB DEPRESSURIZATION
  SYSTEM. DO NOT ALTER OR DISCONNECT"
  c. LABEL RADON FAN CIRCUIT BREAKER. LABEL TO READ:
  "SUB-SLAB DEPRESSURIZATRION FAN CIRCUIT. DO NOT
  TURN OFF"
- 4. PROPOSED LOCATIONS OF DEPRESSURIZATION SYSTEM RISER PIPES TO BE VERIFIED BY ARCHITECT.
- 5. PREPARE SUBSOIL AS SPECIFIED BY PROJECT GEOTECHNICAL OR STRUCTURAL ENGINEER. PLACE, LEVEL, AND COMPACT GRAVEL BED CONSISTING OF CLEAN 3/4-INCH BLUESTONE, OR AN EQUIVALENT APPROVED BY THE DESIGN ENGINEER. GRAVEL TO BE NO MORE THAN 1-INCH IN DIAMETER.
- 6. THE RISERS SHALL RAISE AT LEAST 3-FEET ABOVE THE ROOF, RAIN CAPS SHALL BE INSTALLED ON THE ROOF AT THE END OF THE RISERS.
- 7. PLUMBING, PRIMING, GLUING, PAINTING, FASTENING, AND SUPPORTING PVC AND STEEL PIPES, SCREENS, RISERS, AND FITTINGS TO BE CONDUCTED IN ACCORDANCE WITH EXISTING PROJECT PLANS AND SPECIFICATIONS, INDUSTRY STANDARDS, AND MANUFACTURERS INSTRUCTIONS, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER. THE INSTALLATION SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES.
- 8. CONTRACTOR SHALL STORE MATERIALS IN A CLEAN AND DRY AREA, AND SHALL PROTECT MATERIALS FROM DAMAGE DURING HANDLING AND INSTALLATION.
- 9. SAMPLING PORTS SHALL BE INSTALLED AT EACH SEPARATE BRANCH OF THE SSDS FOR TESTING OF THE SYSTEM EFFECTIVENESS.
- 10. EXTRACTION PIPE PRESSURE GAUGES TO BE INSTALLED IN VISIBLE LCOATION TO INDICATE PROPER OPERATIONS OF THE SYSTEM AND ADEQUATE NEGATIVE PRESSURE.
- 11. REMOTE MOUNTED PRESSURE ALARM WITH VISUAL INDICATION TO BE INSTALLED IN VISIBLE LOICATION TO INDICATE FAILURE OF THE SYSTEM.

1. AS PER THE MEMORANDUM ISSUED BY THE NYSDEC ("SUBSTANTIVE COMPLIANCE WITH AIR REQUIRMENTS" FEBRURY 28, 2003), ANY REMEDIAL SYSTEM UNDER A DEC PROGRAM IS EXEMPT FOR AIR PERMITTING. HOWEVER, ALL SYSTEMS MUST DEMONSTRATE THAT THE COMPLY WITH THE SUBSTANTIVE REGULATION. IN THE CASE OF THE PROPSOED SSD SYSTEM, BASED ON HISOTRICAL EMISSIONS SAMPLING RESULTS AND THE SSDS PERFORMANCE SPECIFICATION (LOW FLOW), OFF-GAS TREATMENT WILL NOT BE REQUIRED TO SATISFY THIS REQUIREMENT. ALTHOUGH IT IS NOT ANTICIPATED, IN THE EVENT THAT FUTURE SAMPLING RESULTS INDICATE THE NEED FOR OFF-GAS TREATMENT, THE SYSTEM CAN BE RETRIFITTED TO ACCOMODATE TREATMENT IN ORDER TO BRING THE SYSTEM BACK INTO REGULATORY COMPLAINCE.

BCP #C241254



## GENERAL NOTES: SUB-SLAB DEPRESSURIZATION SYSTEM

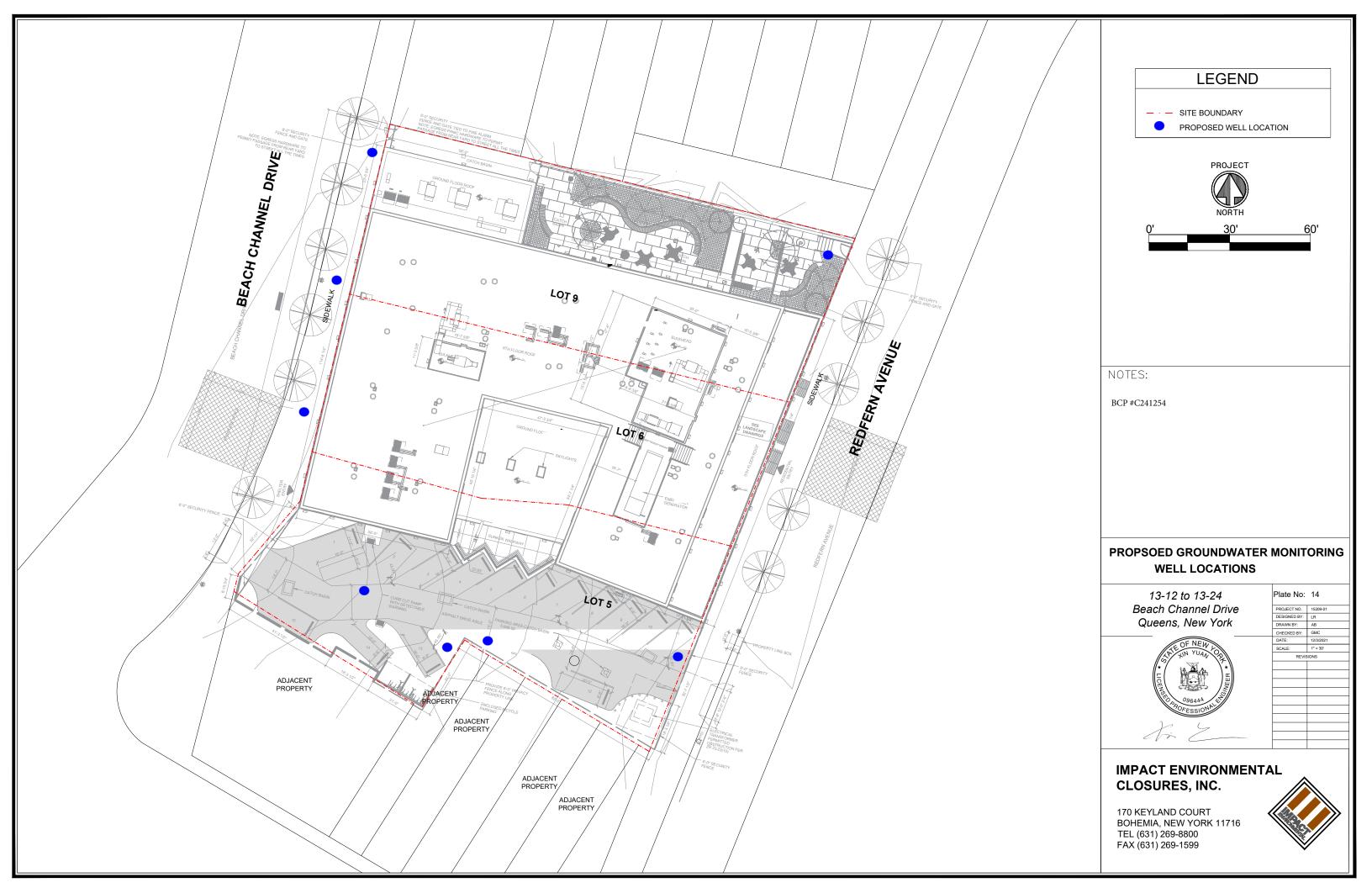
13-12 to 13-24 Beach Channel Drive Queens, New York

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|   | CHECKED BY:  | GMC        |  |  |
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Plate No: 13b

## IMPACT ENVIRONMENTAL CLOSURES, INC.

170 KEYLAND COURT BOHEMIA, NEW YORK 11716 TEL (631) 269-8800 FAX (631) 269-1599



## **TABLES**

13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, NY



### **Table 1: 6 NYCRR Part 375 Soil Cleanup Objectives**

### Unrestricted Use, Restricted-Residential and Protection of Groundwater

| CAS Number           | Parameter Name   | Parameter<br>ID | NYCRR 375<br>Unrestricted<br>Use | NYCRR 375<br>Restricted-<br>Residential | NYCRR 375<br>Protection of<br>Groundwater |
|----------------------|--|-----------------|----------------------------------|---|---|
| 630-20-6             | 1,1,1,2-Tetrachloroethane                              | VOC             | NA                               | NA                                      | NA  |
| 71-55-6              | 1,1,1-Trichloroethane                                  | VOC             | 680                              | 100,000a                                | 680                                       |
| 79-34-5              | 1,1,2,2-Tetrachloroethane                              | VOC             | NA                               | NA                                      | 600                                       |
| 79-00-5              | 1,1,2-Trichloroethane                                  | VOC             | NA                               | NA                                      | NA  |
| 76-13-1              | 1,1,2 Trichloro-1,2,2 Trifluoroethane                  | VOC             | NA                               | NA                                      | NA  |
| 75-34-3              | 1,1-Dichloroethane                                     | VOC             | 270                              | 26000                                   | 270                                       |
| 75-35-4              | 1,1-Dichloroethene                                     | VOC             | 330                              | 100,000a                                | 330                                       |
| 96-18-4              | 1,2,3-Trichloropropane                                 | VOC             | NA                               | NA                                      | 340                                       |
| 120-82-1             | 1,2,4-Trichlorobenzene                                 | VOC             | NA<br>2.600                      | NA<br>F2000                             | 3400                                      |
| 95-63-6              | 1,2,4-Trimethylbenzene                                 | VOC             | 3,600                            | 52000                                   | 3600                                      |
| 96-12-8              | 1,2-Dibromo-3-Chloropropane                            | VOC<br>VOC      | NA                               | NA<br>NA                                | NA  |
| 106-93-4             | 1,2-Dibromoethane                                      | VOC             | NA<br>1 100                      |   | NA<br>1100                                |
| 95-50-1              | 1,2-Dichlorobenzene                                    |                 | 1,100                            | 100,000a                                | 1100                                      |
| 107-06-2             | 1,2-Dichloroethane                                     | VOC             | 20c                              | 3100                                    | 20f                                       |
| 78-87-5              | 1,2-Dichloropropane                                    | VOC<br>VOC      | NA<br>8 400                      | NA<br>52000                             | NA<br>8400                                |
| 108-67-8<br>541-73-1 | 1,3,5-Trimethylbenzene                                 | VOC             | 8,400                            | 49000                                   | 8400                                      |
| 541-73-1<br>142-28-9 | 1,3-Dichlorobenzene                                    | VOC             | 2,400                            | 49000<br>NA                             | 2400<br>300                               |
| 142-28-9<br>542-75-6 | 1,3-Dichloropropane 1,3-Dichloropropene(cis and trans) | VOC             | NA<br>NA                         | NA<br>NA                                | NA  |
| 106-46-7             |  | VOC             |                                  | 13000                                   |   |
| 123-91-1             | 1,4-Dicyana  | VOC             | 1,800<br>100b                    | 13000                                   | 1800                                      |
| 78-93-3              | 1,4-Dioxane<br>2-Butanone                              | VOC             | 120                              |   | 100e                                      |
| 78-93-3<br>95-49-8   | 2-Chlorotoluene  | VOC             | NA                               | 100,000a<br>NA                          | 120<br>NA                                 |
| 108-10-1             | 4-Methyl-2-Pentanone                                   | VOC             | NA<br>NA                         | NA<br>NA                                | 1000                                      |
| 67-64-1              | Acetone  | VOC             | 50                               | 100,000b                                | 50  |
| 107-02-8             | Acrolein   | VOC             | NA                               | NA                                      | NA  |
| 107-02-6             | Acrylonitrile  | VOC             | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 71-43-2              | Benzene  | VOC             | 60                               | 4800                                    | 60  |
| 71-43-2<br>74-97-5   | Bromochloromethane                                     | VOC             | NA                               | NA                                      | NA  |
| 75-27-4              | Bromodichloromethane                                   | VOC             | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 75-25-2              | Bromoform  | VOC             | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 74-83-9              | Bromomethane   | VOC             | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 75-15-0              | Carbon Disulfide                                       | VOC             | NA<br>NA                         | NA<br>NA                                | 2700                                      |
| 56-23-5              | Carbon Tetrachloride                                   | VOC             | 760                              | 2400                                    | 760                                       |
| 108-90-7             | Chlorobenzene  | VOC             | 1,100                            | 100,000a                                | 1100                                      |
| 124-48-1             | Chlorodibromomethane                                   | VOC             | NA                               | NA                                      | NA  |
| 75-00-3              | Chloroethane   | VOC             | NA                               | NA<br>NA                                | 1900                                      |
| 67-66-3              | Chloroform   | VOC             | 370                              | 49000                                   | 370                                       |
| 74-87-3              | Chloromethane  | VOC             | NA                               | NA                                      | NA NA                                     |
| 156-59-2             | cis-1,2-Dichloroethene                                 | VOC             | 250                              | 100,000a                                | 250                                       |
| 74-95-3              | Dibromomethane   | VOC             | NA                               | NA                                      | NA  |
| 75-71-8              | Dichlorodifluoromethane                                | VOC             | NA                               | NA                                      | NA NA                                     |
| 100-41-4             | Ethylbenzene   | VOC             | 1,000                            | 41000                                   | 1000                                      |
| 98-82-8              | Isopropylbenzene                                       | VOC             | ,<br>NA                          | NA                                      | 2300                                      |
| 79-20-9              | Methyl Acetate   | VOC             | NA                               | NA                                      | NA  |
| 75-09-2              | Methylene Chloride                                     | VOC             | 50                               | 100,000a                                | 50  |
| 1634-04-4            | Methyl Tert-Butyl Ether                                | VOC             | 930                              | 100,000a                                | 930                                       |
| 104-51-8             | n-Butylbenzene   | VOC             | 12,000                           | 100,000a                                | 12000                                     |
| 103-65-1             | n-Propylbenzene  | VOC             | 3,900                            | 100,000a                                | 3900                                      |
| 99-87-6              | p-Isoproplytoluene                                     | VOC             | NA                               | ŇA                                      | 10000                                     |
| 135-98-8             | sec-Butylbenzene                                       | VOC             | 11,000                           | 100,000a                                | 11000                                     |
| 100-42-5             | Styrene  | VOC             | NA                               | NA                                      | NA  |
| 98-06-6              | tert-Butylbenzene                                      | VOC             | 5,900                            | 100,000a                                | 5900                                      |
| 75-65-0              | Tertiary Butyl Alcohol                                 | VOC             | NA                               | NA                                      | NA  |
| 127-18-4             | Tetrachloroethene                                      | VOC             | 1,300                            | 19000                                   | 1300                                      |
| 108-88-3             | Toluene  | VOC             | 700                              | 100,000a                                | 700                                       |
| 1330-20-7            | Total Xylenes  | VOC             | 260                              | 100,000a                                | 1600                                      |
| 156-60-5             | trans-1,2-Dichloroethene                               | VOC             | 190                              | 100,000a                                | 190                                       |
| 79-01-6              | Trichloroethene  | VOC             | 470                              | 21000                                   | 470                                       |
| 75-69-4              | Trichlorofluoromethane                                 | VOC             | NA                               | NA                                      | NA  |
| 108-05-4             | Vinyl Acetate  | VOC             | NA                               | NA                                      | NA  |
| 75-01-4              | Vinyl Chloride   | VOC             | 20                               | 900                                     | 20  |

### **Table 1: 6 NYCRR Part 375 Soil Cleanup Objectives**

### Unrestricted Use, Restricted-Residential and Protection of Groundwater

| CAS Number            | Parameter Name                                  | Parameter ID SVOC | NYCRR 375<br>Unrestricted<br>Use | NYCRR 375<br>Restricted-<br>Residential | NYCRR 375<br>Protection of<br>Groundwater |
|-----------------------|---|-------------------|----------------------------------|---|---|
| 87-68-3<br>92-52-4    | Hexachlorobutadiene 1-1- Biphenyl               | SVOC              | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 122-66-7              | 1,2- Diphenylhydrazine                          | SVOC              | NA NA                            | NA<br>NA                                | NA<br>NA                                  |
| 95-94-3               | 1,2,4,5-Tetrachlorobenzene                      | SVOC              |                                  | NA                                      | NA  |
| 58-90-2               | 2,3,4,6-Tetrachlorophenol                       | SVOC              |                                  | NA                                      | NA  |
| 95-95-4               | 2,4,5-Trichlorophenol                           | SVOC              | NA                               | NA                                      | 100                                       |
| 88-06-2<br>120-83-2   | 2,4,6-Trichlorophenol<br>2,4-Dichlorophenol     | SVOC<br>SVOC      | NA<br>NA                         | NA<br>NA                                | NA<br>400                                 |
| 105-67-9              | 2,4-Dimethylphenol                              | SVOC              | NA<br>NA                         | NA<br>NA                                | NA  |
| 51-28-5               | 2,4-Dinitrophenol                               | SVOC              | NA                               | NA                                      | 200                                       |
| 121-14-2              | 2,4-Dinitrotoluene                              | SVOC              | NA                               | NA                                      | NA  |
| 606-20-2              | 2,6-Dinitrotoluene                              | SVOC              | NA                               | NA                                      | 170                                       |
| 91-58-7<br>95-57-8    | 2-Chloronaphthalene                             | SVOC<br>SVOC      | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 95-57-8<br>91-57-6    | 2-Chlorophenol 2-Methylnaphthalene              | SVOC              | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 95-48-7               | 2-Methylphenol                                  | SVOC              | 330b                             | 100,000a                                | 330e                                      |
| 88-74-4               | 2-Nitroaniline                                  | SVOC              | NA                               | NA                                      | 400                                       |
| 88-75-5               | 2-Nitrophenol                                   | SVOC              | NA                               | NA                                      | 300                                       |
| 91-94-1               | 3,3-Dichlorobenzidine                           | SVOC              | NA<br>330h                       | NA<br>100,000s                          | NA<br>220-                                |
| 108-39-4<br>99-09-2   | m-Cresol(s) 3-Nitroaniline                      | SVOC<br>SVOC      | 330b<br>NA                       | 100,000a<br>NA                          | 330e<br>500                               |
| 99-09-2<br>534-52-1   | 4,6-Dinitro-2-methylphenol                      | SVOC              | NA<br>NA                         | NA<br>NA                                | NA  |
| 59-50-7               | 4-Chloro-3-methylphenol                         | SVOC              | NA NA                            | NA NA                                   | NA<br>NA                                  |
| 106-47-8              | 4-Chloroaniline                                 | SVOC              | NA                               | NA                                      | 220                                       |
| 106-44-5              | 4-Methylphenol                                  | SVOC              | 330b                             | 100,000a                                | 330e                                      |
| 15831-10-4            | 3+4 Methylphenol                                | SVOC              | NIA.                             | 100,000a                                | 330e                                      |
| 100-01-6<br>100-02-7  | 4-Nitroaniline<br>4-Nitrophenol                 | SVOC<br>SVOC      | NA<br>NA                         | NA<br>NA                                | NA<br>100                                 |
| 83-32-9               | Acenaphthene                                    | SVOC              | 20,000                           | 100,000a                                | 98000                                     |
| 208-96-8              | Acenaphthylene                                  | SVOC              | 100,000a                         | 100,000a                                | 107000                                    |
| 98-86-2               | Acetophenone                                    | SVOC              | ŇA                               | ,<br>NA                                 | NA  |
| 62-53-3               | Aniline   | SVOC              | NA                               | 100000                                  | 330                                       |
| 120-12-7              | Anthracene                                      | SVOC              | 100,000a                         | 100,000a                                | 1,000,000c                                |
| 1912-24-9<br>100-52-7 | Atrazine<br>Benzaldehyde                        | SVOC<br>SVOC      | NA<br>NA                         | NA<br>NA                                | NA<br>NA                                  |
| 92-87-5               | Benzidine                                       | SVOC              | NA NA                            | NA NA                                   | NA NA                                     |
| 56-55-3               | Benzo-a-Anthracene                              | SVOC              | 1,000c                           | 1,000f                                  | 1,000f                                    |
| 50-32-8               | Benzo-a-Pyrene                                  | SVOC              | 1,000c                           | 1,000f                                  | 22000                                     |
| 205-99-2              | Benzo-b-Fluoranthene                            | SVOC              | 1,000c                           | 1,000f                                  | 1700                                      |
| 207-08-9<br>191-24-2  | Benzo-k-Fluoranthene<br>Benzo-g,h,i-Perylene    | SVOC<br>SVOC      | 800c<br>100,000                  | 3900<br>100,000a                        | 1700<br>1,000,000c                        |
| 65-85-0               | Benzoic Acid                                    | SVOC              | NA                               | NA                                      | 100000                                    |
| 100-51-6              | Benzyl Alcohol                                  | SVOC              | NA                               | NA                                      | NA  |
| 111-44-4              | Bis(2-Chloroethyl)ether                         | SVOC              | NA                               | NA                                      | NA  |
| 108-60-1              | Bis(2-Chloroisopropyl)ether                     | SVOC              | NA                               | NA                                      | NA<br>425000                              |
| 117-81-7<br>85-68-7   | Bis(2-Ethylhexyl)Phthalate Butylbenzylphthalate | SVOC<br>SVOC      | NA<br>NA                         | NA<br>NA                                | 435000<br>122000                          |
| 105-60-2              | Caprolactam                                     | SVOC              | NA<br>NA                         | NA<br>NA                                | 122000<br>NA                              |
| 86-74-8               | Carbazole                                       | SVOC              | NA                               | NA NA                                   | NA NA                                     |
| 218-01-9              | Chrysene  | SVOC              | 1,000c                           | 3900                                    | 1,000f                                    |
| 75-99-0               | Dalapon   | SVOC              | 7.000                            | NA<br>F0000                             | NA<br>(200                                |
| 132-64-9              | Dibenzofuran                                    | SVOC              | 7,000                            | 59000                                   | 6200                                      |
| 53-70-3<br>84-66-2    | Dibenzo-a,h-Anthracene Diethyl Phthalate        | SVOC<br>SVOC      | 330b<br>NA                       | 330e<br>NA                              | 1,000,000c<br>7100                        |
| 131-11-3              | Dimethyl Phthalate                              | SVOC              | NA<br>NA                         | NA<br>NA                                | 27000                                     |
| 84-74-2               | Di-n-Butyl Phthalate                            | SVOC              | NA                               | NA                                      | 8100                                      |
| 25321-14-6            | Dinitrotoluene(2,4-/2,6-)                       | SVOC              | NA                               | NA                                      | NA  |
| 117-84-0              | Di-n-Octyl Phthalate                            | SVOC              | NA<br>100,000                    | NA                                      | 120000                                    |
| 206-44-0<br>36-73-7   | Fluoranthene<br>Fluorene                        | SVOC<br>SVOC      | 100,000<br>30,000                | 100,000a<br>100,000a                    | 1,000,000c<br>386000                      |
| 80-73-7<br>118-74-1   | Hexachlorobenzene                               | SVOC              | 30,000                           | 1200                                    | 3200                                      |
| 77-47-4               | Hexachlorocyclopentadiene                       | SVOC              | NA NA                            | NA NA                                   | NA NA                                     |
| 67-72-1               | Hexachloroethane                                | SVOC              | NA                               | NA                                      | NA  |
| 193-39-5              | Indeno(1,2,3-cd)Pyrene                          | SVOC              | 500c                             | 500f                                    | 8200                                      |
| 78-59-1               | Isophorone                                      | SVOC              | NA<br>12,000                     | NA<br>100,000a                          | 4400                                      |
| 91-20-3<br>98-95-3    | Naphthalene<br>Nitrobenzene                     | SVOC<br>SVOC      | 12,000<br>NA                     | 100,000a<br>15000                       | 12000<br>170                              |
| 62-75-9               | N-Nitrosodimethylamine                          | SVOC              | NA<br>NA                         | NA                                      | NA  |
| 621-64-7              | N-Nitroso-di-n-Propylamine                      | SVOC              | NA NA                            | NA NA                                   | NA NA                                     |
| 86-30-6               | N-Nitrosodiphenylamine                          | SVOC              | NA                               | NA                                      | NA  |
| 87-86-5               | Pentachlorophenol                               | SVOC              | 800b                             | 6700                                    | 800e                                      |
| 85-01-8               | Phenal  | SVOC              | 100,000                          | 100,000a                                | 1,000,000c                                |
| 108-95-2              | Phenol  | SVOC<br>SVOC      | 330b<br>100000                   | 100,000a<br>100,000a                    | 330e<br>1,000,000c                        |

### **Table 1: 6 NYCRR Part 375 Soil Cleanup Objectives**

### Unrestricted Use, Restricted-Residential and Protection of Groundwater

| CAS Number             | Parameter Name               | Parameter<br>ID     | NYCRR 375<br>Unrestricted<br>Use | NYCRR 375<br>Restricted-<br>Residential | NYCRR 375<br>Protection of<br>Groundwater |
|------------------------|------------------------------|---------------------|----------------------------------|---|---|
| 93-76-5                | 2,4,5-T                      | HERBICIDE           | NA                               | NA                                      | 1900                                      |
| 93-72-1                | 2,4,5-TP Acid                | PESTICIDE           | 3,800                            | 100,000a                                | 3800                                      |
| 94-75-7                | 2,4-D                        | HERBICIDE           | NA                               | NA<br>12000                             | 500                                       |
| 72-54-8                | 4,4-DDD                      | PESTICIDE           | 3.3b                             | 13000                                   | 14000                                     |
| 72-55-9<br>50-29-3     | 4,4-DDE                      | PESTICIDE           | 3.3b                             | 8900<br>7900                            | 17000                                     |
| 309-00-2               | 4,4-DDT<br>Aldrin            | PESTICIDE PESTICIDE | 3.3b<br>5c                       | 97                                      | 136000<br>190                             |
| 319-84-6               | alpha-BHC                    | PESTICIDE           | 20                               | 480                                     | 20  |
| 519-64-6               | Alpha Chlordane              | PESTICIDE           | 94                               | 4200                                    | 2900                                      |
| 12674-11-2             | Aroclor 1016                 | PCB                 | NA                               | NA                                      | NA  |
| 11104-28-2             | Aroclor 1221                 | PCB                 | NA NA                            | NA NA                                   | NA NA                                     |
| 11141-16-5             | Aroclor 1232                 | PCB                 | NA                               | NA                                      | NA NA                                     |
| 53469-21-9             | Aroclor 1242                 | PCB                 | NA                               | NA                                      | NA  |
| 12672-29-6             | Aroclor 1248                 | PCB                 | NA                               | NA                                      | NA  |
| 11097-69-1             | Aroclor 1254                 | PCB                 | NA                               | NA                                      | NA  |
| 11096-82-5             | Aroclor 1260                 | PCB                 | NA                               | NA                                      | NA  |
| 37324-23-5             | Aroclor 1262                 | PCB                 |                                  | NA                                      | NA  |
| 11100-14-4             | Aroclor 1268                 | PCB                 |                                  | NA                                      | NA  |
| 319-85-7               | beta-BHC                     | PESTICIDE           | 36                               | 360                                     | 90  |
| 57-74-9                | Chlordane                    | PESTICIDE           | 94                               | 4200                                    | 2900                                      |
| 319-86-8               | delta-BHC                    | PESTICIDE           | 40                               | 100,000a                                | 250                                       |
| 1918-00-9              | Dicamba                      | HERBICIDE           | NA                               | NA                                      | NA  |
| 60-57-1                | Dieldrin                     | PESTICIDE           | 5                                | 200                                     | 100                                       |
| 115-29-7               | Endosulfan                   | PESTICIDE           | 2400                             | NA                                      | NA  |
| 959-98-8               | Endosulfan I                 | PESTICIDE           | 2,400                            | 24,000i                                 | 102000                                    |
| 33213-65-9             | Endosulfan II                | PESTICIDE           | 2,400                            | 24,000i                                 | 102000                                    |
| 1031-07-8              | Endosulfan Sulfate           | PESTICIDE           | 2,400                            | 24,000i                                 | 1,000,000c                                |
| 72-20-8<br>58-89-9     | Endrin                       | PESTICIDE PESTICIDE | 14                               | 11000                                   | 60  |
| 5103-74-2              | gamma-BHC<br>Gamma Chlordane | PESTICIDE           | 100<br>NA                        | 1300<br>NA                              | 100<br>14000                              |
| 76-44-8                | Heptachlor                   | PESTICIDE           | 42                               | 2100                                    | 380                                       |
| 1024-57-3              | Heptachlor Epoxide           | PESTICIDE           | NA                               | NA                                      | 20  |
| 72-43-5                | Methoxychlor                 | PESTICIDE           | NA NA                            | NA NA                                   | 900000                                    |
| 56-38-2                | Parathion                    | PESTICIDE           | NA                               | NA                                      | 1200                                      |
| 1336-36-3              | Polychlorinated Biphenyls    | PCBs                | 100                              | 1000                                    | 3200                                      |
| 8001-35-2              | Toxaphene                    | PESTICIDE           | NA                               | NA                                      | NA  |
|                        | Unit                         |                     | mg/kg                            | тд/кд                                   | mg/kg                                     |
| 7429-90-5              | Aluminum, Al                 | METAL               | NA                               | NA                                      | NA  |
| 7440-36-0              | Antimony, Sb                 | METAL               | NA                               | NA                                      | NA  |
| 7440-38-2              | Arsenic, As                  | METAL               | 13c                              | 16f                                     | 16f                                       |
| 7440-39-3              | Barium, Ba                   | METAL               | 350c                             | 400                                     | 820                                       |
| 7440-41-7              | Beryllium, Be                | METAL               | 7.2                              | 72                                      | 47  |
| 7440-42-8              | Boron, B                     | METAL               |                                  | NA                                      | NA  |
| 7440-43-9              | Cadmium, Cd                  | METAL               | 2.5c                             | 4.3                                     | 7.5                                       |
| 7440-47-3              | Chromium, Cr                 | METAL               | NA                               | 110                                     | NA<br>10                                  |
| 18540-29-9             | Chromium, hexavalent         | METAL               | 1b                               | 110                                     | 19  |
| 16065-83-1             | Chromium, trivalent          | METAL               | 30c                              | 180                                     | NA<br>NA                                  |
| 7440-48-4<br>7440-50-8 | Cobalt, Co                   | METAL<br>METAL      | NA<br>50                         | NA<br>270                               | NA<br>1720                                |
| 57-12-5                | Copper, Cu<br>Cyanide        | METAL               | 27                               | 270                                     | 1720<br>40                                |
| 7439-89-6              | Iron, Fe                     | METAL               | NA                               | NA                                      | NA  |
| 7439-89-8<br>7439-92-1 | Lead, Pb                     | METAL               | 63c                              | 400                                     | 450                                       |
| 7439-96-5              | Manganese, Mn                | METAL               | 1,600c                           | 2,000f                                  | 2,000f                                    |
| 7439-97-6              | Mercury, Hg                  | METAL               | .18c                             | .81j                                    | 0.73                                      |
| 7440-02-0              | Nickel, Ni                   | METAL               | 30                               | 310                                     | 130                                       |
| 7782-49-2              | Selenium, Se                 | METAL               | 3.9c                             | 180                                     | 4f  |
| 7440-22-4              | Silver, Ag                   | METAL               | 2                                | 180                                     | 8.3                                       |
| 7440-31-5              | Tin, Sn                      | METAL               |                                  | NA                                      | NA  |
| 7440-28-0              | Thallium, Tl                 | METAL               | NA                               | NA                                      | NA  |
| 7440-62-2              | Vanadium, V                  | METAL               | NA                               | NA                                      | NA  |
| 7440-66-6              | Zinc, Zn                     | METAL               | 109c                             | 10,000d                                 | 2480                                      |
| рН                     | pH                           | pН                  |                                  | NA                                      | NA  |

#### Table 2

#### Track 1 Remedial Cost Estimate 13-12 Beach Channel Drive, Far Rockaway, New York NYSDEC BCP Site No.: C241254

| Item<br>No. | Description of Item  | Quantity   | Unit                 |         | Unit Cost         |         | Total Cost |
|-------------|--|------------|----------------------|---------|-------------------|---------|------------|
|             | REMEDIATION FEES   |            |                      |         |                   |         |            |
| 1           | Supplemental Waste Characterization (to obtain waste facility approvals)   | 2          | Per Sample           | \$      | 250               | \$      | 500        |
| 2           | Off-Site Transport and Disposal of Hazardous F-Listed Waste  | 200        | Per Ton              | \$      | 300               | \$      | 60,000     |
| 3           | Contained-In Determinaiton for Hazardous Soil / IDW  |            | Allowance            |         |                   | \$      | 5,000      |
| 4           | Off-Site Transport and Disposal of Non-Hazardous Regulated Soil  | 7,975      | Per Ton              | \$      | 39                | \$      | 311,025    |
| 5           | Support of Excavation (SOE)  | 13,125     | SF                   | \$      | 75                | \$      | 984,375    |
| 6           | Backfill of Excavation - Import and Placement  | 7,250      | CY                   | \$      | 35                | Ś       | 253,750    |
| 7           | Dust, Odor, and Vapor Control  | 2          | Per Month            | \$      | 5,000             | \$      | 10,000     |
| 8           | On-Site Monitoring Well Abandonment Prior to Remedial Action (220 LF)  |            | Allowance            |         |                   | \$      | 4,500      |
| 9           | Supplemental Soil Vapor Intrusion Study (5 soil gas samples post-excavation)   |            | Allowance            |         |                   | \$      | 10,000     |
| 10          | Soil Vapor Extraction System (Design Phase Investigation, Installation, Startup / Shakedown)   | Allowance  |                      |         |                   | \$      | 92,870     |
| 11          | Sub-Slab Depressurization Materials and Installation (Suction Pit System w/ Inline Fans)   | Allowance  |                      |         |                   | \$      | 60,000     |
| 12          | Special Inspections, Startup/Shakedown, Vacuum Monitoring Point Install, and Startup Sampling  | Allowance  |                      |         |                   | \$      | 16,000     |
| 13          |  |            |                      |         |                   | \$      | 60,408     |
| 14          | Operation and Maintenance for the SSDS and SVE (monthly visits, carbon purge water disposal, bi-annual sampling, annual certification) | 5 Per Year |                      | 35,000  | \$                | 175,000 |            |
| 15          | Secant Pile / Cut Off Wall (Southern Perimeter to an est. depth of 34 fbg)   | 120        | LF                   | \$      | 5,000             | \$      | 600,000    |
| 16          | Post Remedial Action Monitoring Well Installation / Replacement (260 LF) 4-intermediate & 4-shallow, and well development              | Allowance  |                      |         | \$                | 19,500  |            |
| 17          | Post-Treatment Groundwater Sampling (quarterly for 1 year, 12 samples per quarter)   | 4          | Per Quarter          | \$      | 12,000            | \$      | 48,000     |
| 18          | Environmental Monitoring (oversight and community air monitoring program and equipment/unit rental)                                    | 3          | Per Month            | \$      | 33,400            | \$      | 100,200    |
| 19          | Post-Excavation Endpoint Sampling (10 samples plus QA/QC samples to document residual soil quality)                                    | 13         | Per Sample           | \$      | 1,350             | \$      | 17,550     |
| 20          | Imported Clean Fill or Reuse Sampling (<1,000 CYs)   | Allowance  |                      |         | \$                | 2,500   |            |
| 21          | Project Management, Coordination and Environmental Sampling Data Usability Summary Reports   |            | Allowance            |         |                   | \$      | 30,000     |
| 22          | Site Management Plan   | Allowance  |                      |         | \$                | 15,000  |            |
|             | Required Reporting (weekly/monthly progress reports, Final Engineering Report (FER), Data Validation and EQuis                         | Allowance  |                      |         |                   |         |            |
| 23          | Submittals, CPP and fact sheets  | Allowance  |                      | \$      | 45,000            |         |            |
| l           | Instituional and Engineering Control Certification (annual inspeciton and prepartion of Periodic Review Report for                     |            |                      |         |                   |         |            |
| 24          | first 5 years)   | 5          | Per Year             | \$      | 7,000             |         | 35,000     |
|             |  |            |                      | E       | stimated Subtotal |         | 2,956,178  |
|             |  |            |                      |         | 10% Contingency   |         | 295,618    |
| l           |  |            | Alternative 2 -Estir | nated R | Remediation Cost  | : \$    | 3,251,796  |

#### Notes / Assumptions:

- Remedial costs listed above are estimates and for the purposes of comparing potential remedial alternatives.
- A soil density conversion factor of 1.5 tons per CY was used. Assumes foundation soil will be reused on-site.
- Soil excavation costs only included hot-spot removal for the remedy. The remainder of site-wide excavation is considered part of construction and not related to remediation. Excavation depths were estimated using the Remedial Investigation soil sample reuslts.
- Assumes soil remaing in place meets the Track 1 Unrestricted Use Soil Cleanup Objectives.
- Assumes dewatering will not be required.
- Costs listed above exclude legal fees, insurance and general consulting
- Pre-treatment design and requirements for air discharge is not included and will be assessed upon activation of the SSDS or SVE.
- Assumes NYS Hazardous Waste Assessment fees will be waived due to the Site's enrollment in the NYS BCP.
- Costs do not include new building consruction.
- Assumes 1 year of post-remediaiton groundwater monitoring, Long-term monitored natural attenuation gauging and monitoring will be determined after implementation of the remedy.
- Changes to the referenced estimated costs are likely to occur as a result of each stage remediation and new information, including groundwater treatment and hot-spot excavation effectiveness.
- Support of Excavation is not included and is not considered part fo the remedy.

#### Table 3

## Track 2 Remedial Cost Estimate 13-12 Beach Channel Drive, Far Rockaway, New York NYSDEC BCP Site No.: C241254

| Item<br>No. | Description of Item  | Quantity   | Quantity Unit Unit Cost |      |                           |        | Total Cost |
|-------------|--|------------|-------------------------|------|---------------------------|--------|------------|
|             | REMEDIATION FEES   |            |                         |      |                           |        |            |
| 1           | Supplemental Waste Characterization (to obtain waste facility approvals)   | 2          | Per Sample              | \$   | 250                       | \$     | 500        |
| 2           | Off-Site Transport and Disposal of Hazardous F-Listed Waste  | 200        | Per Ton                 | \$   | 300                       | \$     | 60,000     |
| 3           | Contained-In Determinaiton for Hazardous Soil / IDW  |            | Allowance               |      |                           | \$     | 5,000      |
| 4           | Off-Site Transport and Disposal of Non-Hazardous Regulated Soil  | 200        | Per Ton                 | \$   | 39                        | \$     | 7,800      |
| 6           | Dust, Odor, and Vapor Control  | 2          | Per Month               | \$   | 5,000                     | \$     | 10,000     |
| 7           | On-Site Monitoring Well Abandonment Prior to Remedial Action (220 LF)  |            | Allowance               |      |                           | \$     | 4,500      |
| 8           | Supplemental Soil Vapor Intrusion Study (5 soil gas samples post-excavation)                                       |            | Allowance               |      |                           | \$     | 10,000     |
| 9           | Soil Vapor Extraction System (Design Phase Investigation, Installation, Startup / Shakedown)                       |            | Allowance               |      |                           | \$     | 92,870     |
| 10          | Sub-Slab Depressurization Materials and Installation (Suction Pit System w/ Inline Fans)                           |            | Allowance               |      |                           | \$     | 60,000     |
| 11          | Special Inspections, Startup/Shakedown, Vacuum Monitoring Point Install, and Startup Sampling                      |            | Allowance               |      |                           | \$     | 16,000     |
| 12          | Vapor Barrier Membrane (Material and Install)  | 20,136     | Per SF                  | \$   | 3                         | \$     | 60,408     |
|             | Operation and Maintenance for the SSDS and SVE (monthly visits, carbon purge water disposal, bi-annual sampling,   | 5          | Per Year                |      |                           |        |            |
|             | annual certification)  |            | rei ieai                | \$   | 35,000                    | \$     | 175,000    |
| 14          | Groundwater Treatment: Plume Stop and ZVI Application Source Area  |            | Allowance               |      |                           | \$     | 140,000    |
|             | Post Remedial Action Monitoring Well Installation / Replacement (260 LF) 4-intermediate & 4-shallow, and well      | Allauranaa |                         |      |                           |        |            |
| 15          | development  | Allowance  |                         | \$   | 19,500                    |        |            |
| 16          | Post-Treatment Groundwater Sampling (quarterly for 1 year, 12 samples per quarter)                                 | 4          | Per Quarter             | \$   | 12,000                    | \$     | 48,000     |
| 17          | Environmental Monitoring (oversight and community air monitoring program and equipment/unit rental)                | 3          | Per Month               | \$   | 33,400                    | \$     | 100,200    |
| 18          | Post-Excavation Endpoint Sampling (10 samples plus QA/QC samples to document residual soil quality)                | 13         | Per Sample              | \$   | 1,350                     | \$     | 17,550     |
| 19          | Imported Clean Fill or Reuse Sampling (<1,000 CYs)   |            | Allowance               |      |                           | \$     | 2,500      |
| 20          | Project Management, Coordination and Environmental Sampling Data Usability Summary Reports                         | Allowance  |                         |      |                           | \$     | 30,000     |
| 21          | Site Management Plan   | Allowance  |                         |      | \$                        | 15,000 |            |
|             | Required Reporting (weekly/monthly progress reports, Final Engineering Report (FER), Data Validation and EQuis     | Allowance  |                         |      |                           |        |            |
| 22          | Submittals, CPP and fact sheets  | Allowance  |                         | \$   | 45,000                    |        |            |
|             | Instituional and Engineering Control Certification (annual inspeciton and prepartion of Periodic Review Report for |            |                         |      |                           |        |            |
| 23          | first 5 years)   | 5          | Per Year                | \$   | 7,000                     | \$     | 35,000     |
|             |  |            |                         |      | <b>Estimated Subtotal</b> | •      | 954,828    |
|             |  |            |                         |      | 10% Contingency           |        | 95,483     |
|             |  |            | Alternative 2 -Estim    | ated | Remediation Cost          | \$     | 1,050,311  |

#### Notes / Assumptions:

- Costs listed above are estimated.
- A soil density conversion factor of 1.5 tons per CY was used. Assumes foundation soil for reuse
- Soil excavation costs only include hot-spot removal for the remedy. The remainder of site-wide excavation is considered part of construction and not related to remediation. Excavation depths were estimated using the Remedial Investigation soil sample reuslts.
- Assumes soil remaing in place meets the Track 2 Restricted Use Restricted Residential Soil Cleanup Objectives.
- Assumes dewatering will not be required.
- Costs listed above exclude legal fees, insurance and general consulting
- Pre-treatment requirements for air discharge is not included and will be assessed upon activation of the SSDS or SVE.
- Assumes NYS Hazardous Waste Assessment fees will be waived due to the Site's enrollment in the NYS BCP.
- Cost do not include new building consruction.
- Assumes 1 year of post-remediaiton groundwater monitoring, Long-term monitored natural attenuation gauging and monitoring will be determined after implementation of the remedy.
- Changes to the referenced estimated costs are likely to occur as a result of each stage remediation and new information, including groundwater treatment and hot-spot excavation effectiveness.
- Support of Excavation is not included and is not considered part fo the remedy.

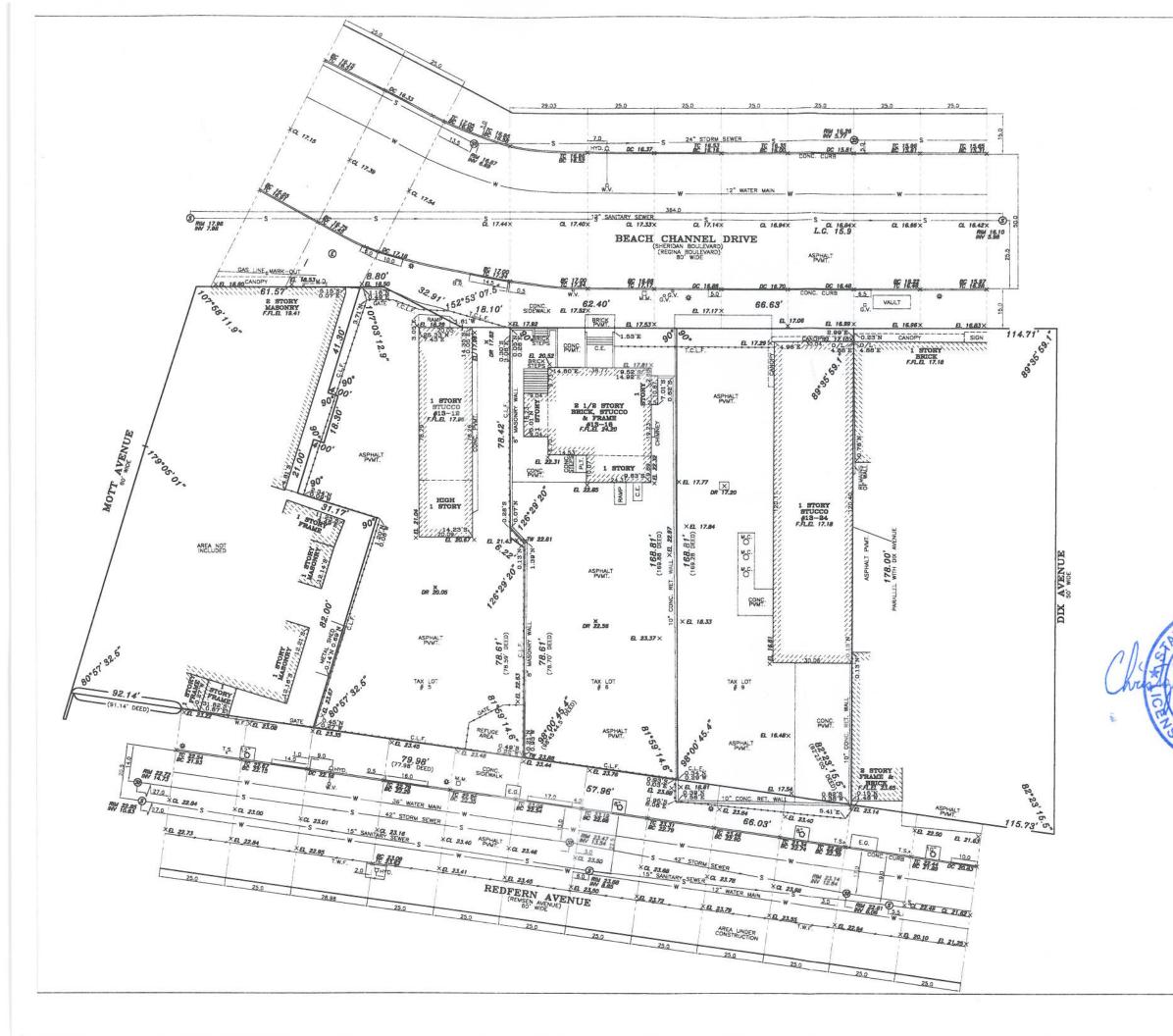
## **APPENDICES**

13-12, 13-16, and 13-24 Beach Channel Drive, Far Rockaway, NY



## Appendix A

Site Survey





- 1. ALL ELEVATIONS REFER TO THE NORTH
- CONSULT WITH THE HIGHWAY DEPARTMENT BEFORE DESIGNING, INSTALLING OR MODIFYING ANY NEW OR EXISTING CURBS, WALKS OR ROADWAYS IN THE STREETS SHOWN HEREON.
- 3. THE OFFSETS OR DIMENSIONS SHOWN FROM THE STRUCTURES TO THE PROPERTY LINES ARE FOR A SPECIFIC FURPOSE AND USE AND THEREFORE ARE NOT INTENDED TO CUIDE THE RECTION OF FENCES, RETAINING VALLS, POOLS, PLANTING AREAS, ADDITIONS TO STRUCTURES AND ANY OTHER CONSTRUCTION.
- 4. SUBSURFACE INFORMATION SHOWN HEREON WAS OUTAINED FROM VARIOUS CITY DEPARTMENTS AND/OR PRIVATE UTILITY COMPANIES. THE SURVEYTO BOSS NOT CERTIFY AS TO THE ACCURACY OR COMPLETENESS OF THIS DATA AND ALL USERS OF THIS SURVEY REFRE TO HOLD THE SURVEYOR HARMLESS FOR THE LOCATION OF SAID UTILITIES. ALL UTILITIES SHOULD BE CONSIDERED APPROXIMATE AND MUST BE CONFIDENCE OF THIS SURVEY PRIOR TO CONSTRUCTION AND/OR THE FURCHASE OF PROPERTY.
- 6. THIS IS TO CERTIFY THAT THERE ARE NO VISIBLE STREAMS OR NATURAL COURSES IN THE PROPERTY AS SHOWN ON THE SURVEY.
- 8. NO SUBSURFACE UTILITY INFORMATION WITHIN THE PROPERTY IS SEGWI. CONTACT ONE CALL TO HAVE ALL SUBSURFACE UTILITY INFORMATION WITHIN THE PROPERTY MARKED OUT PRIOR TO CONSTRUCTION. THE SURVEYOR WILL NOT BE LUBLE OR HELD RESPONSIBLE FOR DAMAGES TO SUBSURFACE UTILITIES EITHER WITHIN OR OUTSIDE THE SURVEYED PROPERTY DUR TO CONSTRUCTION.
- 7. THE USER OF THE SURVEY EXPRESSLY UNDERSTANDS AND ACRESS THAT THE SURVEYOR MAKES NO CLAIM AND DOES NOT CHARANTE THAT THE SEVERS SHOWN HEREON ARE PUBLIC OR THAT ANY PROPERTIES SHOWN ON THIS SURVEY WILL BE ABLE TO CONNECT TO SAME.
- 6. SEWERS MAY NOT EXIST IN FRONT OF SURVEYED PROPERTY. EXISTENCE OR ASSENCE OF SEWERS MUST BE VERIFIED BY USER OF THIS SURVEY PRIOR TO FUNCEASING FROFERTY OR BEGINNING ANY PLANNING OR CONSTRUCTION.
- 9. THE USER OF THIS SURVEY EXPRESSLY AGREES AND UNDERSTANDS THAT SHOULD AGREES AND UNDERSTANDS THAT SHOULD LERISTOPHER BUCKLEY L.S.P.C., PRECISION SURVEYS, EMPLOYEES THEREOP, BE POUND LIBILE IN A COURT OF LAW FOR ERRORS OR OMISSIONS ARISING FROM THIS SURVEY THAT THE LIBIT OF LIABILITY IS THE PRICE FAID FOR THIS SURVEY.
- 10. NOT TO BE USED FOR TITLE PURPOSES.
- 11. USE OF THIS SURVEY SIGNIFIES THAT YOU AGREE AND CONSENT TO ALL OF THE ABOVE.

MOTE:

UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7200 OF THE NEW YORK STATE EDUCATION LAW, COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYORS BLACK INICID OR EMBOSSED SEAL SHALL NOT SEE CONSIDERED TO BE A VALID TITUE COPY.

GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL ROT BE CONSIDERED AND COPY.

GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL ROT BETWEEN THE PREPARED, AND ONLY ON HIS/HER BEHALF TO THE TITLE COMPANY, COMMENDENTIAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION CURRENT SEA CERTIFICATIONS ARE NOT TRANSFERRABLE TO ADDITIONAL INSTITUTIONS OR SURREQUERT OWNERS.

NUTE:
AREA INDICATED IS SHOWN ON ALTERATION MAP
\$1443 & ACQUISITION & DAMAGE MAP \$5761,
\$5765, CITY OF NEW YORK, BOROUGH OF
QUEENS.

NOTE: PLEASE CONTACT APPROPRIATE UTILITY FOR GAS MAIN DIFORMATION.

TOTAL AREA FOR LOT #5 IS 10,939.2 sq.ft.
TOTAL AREA FOR LOT #6 IS 9,858.3 sq.ft.
TOTAL AREA FOR LOT #9 IS 11,448.5 sq.ft.
TOTAL LOTS AREA IS 32246.0 sq.ft.
FOR BUILDING DEPARTMENT USE ONLY

#### TOPOGRAPHIC SURVEY

LOCATED AT:

GAT ( WATER ) BLECTRIC (

13—12, 13—16, 13—24 Beach Channel Drive, Far Rackaway Borough and County of Queens City and State of New York

TAX DESIG: Block 15528, Lots 5,6,9

#### Precision Surveys

TITLE - ARCHITECTURAL - BOUNDARY - CONSTRUCTION
40 FRANKLIN AVE. FRANKLIN SQUARE, N.Y. 11016
Phone (718)472-1571 - (518)488-1808- Fax (718)608-0024
CHRISTOPHER M. BUCKLEY
PROFESSIONAL LAND SURVEYOR

CERTIFIED TO:

Bowery Residents Committee Inc
/ Camber Property Group LLC

DATE: September 16, 2021

SCALE: 1" = 20' Job No.48218

Drawn by MK

## Appendix B

Site Development Plans

## 13-12 BEACH CHANNEL DRIVE

**100% CONSTRUCTION DOCUMENTS** 



**NOTE:** SSDS OR SSVE SYSTEM TO BE INSTALLED BELOW GRADE. DESIGN TO BE COORDINATED WITH UNDERGROUND PIPING AND FOUNDATIONS.

**BOWERY RESIDENTS' COMMITTEE OWNER:** 

131 WEST 25TH STREET, 12TH FLOOR, NEW YORK, NY 10001

**CAMBER PROPERTY GROUP** 

419 PARK AVENUE SOUTH, SUITE 401, NEW YORK, NY 10016

NYC DEPT OF HOUSING, DEVELOPMENT AND PRESERVATION **SPONSOR:** 

100 GOLD STREET, NEW YORK, NY 10038

NYC DEPT OF HOMELESS SERVICES 33 BEAVER STREET, 17TH FLOOR, NEW YORK, NY 10004

**URBAN ARCHITECTURAL INITIATIVES, RA, PC (UAI)** 

233 BROADWAY, SUITE 2150, NEW YORK, NY 10279

GACE CONSULTING ENGINEERS STRUCTURAL ENGINEER:

105 MADISON AVENUE, 6TH FLOOR, NEW YORK, NY 10016

**SKYLINE ENGINEERING MEP ENGINEER:** 

**ARCHITECT:** 

42 WEST 39TH STREET, 10TH FLOOR, NEW YORK, NY 10018

**KRYPTON ENGINEERING CIVIL ENGINEER:** 527 W 48TH STREET, NEW YORK, NY 10036

LIZ FARRELL LANDSCAPE ARCHITECTURE LANDSCAPE ARCHITECT:

523 6TH AVE, BROOKLYN, NY 11215

|                      |  |                      |  | SW VIEW              |  |                            | 323 UTTAVE, BROOKE  |
|----------------------|--|----------------------|--|----------------------|--|----------------------------|---|
|                      | ARCHITECTURAL DRAWING LIST                                     |                      | ARCHITECTURAL DRAWING LIST   |                      | ARCHITECTURAL DRAWING LIST   |                            | ARCHITECTURAL DRAWING LIST  |
| 01 ARCHITEC          | TURAL  | A-403.00             | ENLARGED UFAS UNIT PLANS   | A-056.00             | FURNISHING DETAILS   | P-203.00                   | PLUMBING SANITARY RISER DIAGRAM IV  |
| T-000.00             | COVER  | A-404.00             | ENLARGED DORM ROOMS PLANS  | A-057.00             | FURNISHING DETAILS   | P-204.00                   | PLUMBING SANITARY RISER DIAGRAM V   |
|                      |  | A-451.00             | DORM BATHROOM PLANS & ELEVATIONS I                                       | A-058.00             | PLANTING DETAILS   | P-205.00                   | PLUMBING SANITARY RISER DIAGRAM VI  |
| Z-101.00             | ZONING ANALYSIS I  | A-452.00             | DORM BATHROOM PLANS & ELEVATIONS II                                      | 03 STRUCTUF          |  | P-206.00                   | PLUMBING STORM RISER DIAGRAM  |
| Z-102.00             | ZONING ANALYSIS II   | A-453.00             | DORM BATHROOM PLANS & ELEVATIONS III                                     | S-001.00             | GENERAL NOTES 1  | P-207.00                   | PLUMBING GAS RISER DIAGRAM  |
| Z-103.00<br>Z-104.00 | ZONING PLANS I   | A-454.00<br>A-456.00 | PUBLIC TOILET PLANS & ELEVATIONS I RES. PUBLIC TOILET PLANS & ELEVATIONS | S-002.00<br>S-003.00 | GENERAL NOTES 2 DESIGN CRITERIA 1                                      | P-208.00<br>P-209.00       | PLUMBING DOMESTIC WATER RISER DIAGRAM I PLUMBING DOMESTIC WATER RISER DIAGRAM II        |
| 2-104.00             | ZONING PLANS II  | A-450.00<br>A-461.00 | RES. BATHROOM PLANS & ELEVATIONS I                                       | S-003.00<br>S-004.00 | DESIGN CRITERIA 1 DESIGN CRITERIA 2                                    | P-210.00                   | PLUMBING DOMESTIC WATER RISER DIAGRAM III   |
| G-000.00             | BUILDING CODE ANALYSIS   | A-462.00             | RES. UFAS BATHROOM PLANS & ELEVATIONS                                    | 0-004.00             | DEGIGIA GIATEMA Z  | P-300.00                   | PLUMBING DETAILS I  |
| G-100.00             | GENERAL NOTES  | A-471.00             | KITCHENETTE PLANS & ELEVATIONS   | FO-001.00            | FOUNDATION DETAILS 1   | P-301.00                   | PLUMBING DETAILS II   |
| G-101.00             | ANSI GENERAL NOTES (CH. 301 - 405.10)                          | A-472.00             | UFAS KITCHEN PLANS & ELEVATIONS  | FO-002.00            | FOUNDATION DETAILS 2   | P-302.00                   | PLUMBING DETAILS III  |
| G-102.00             | ANSI GENERAL NOTES (CH. 406.1 - 504.6)                         | A-480.00             | MAIL AREA & LOBBY PLAN & ELEVATIONS                                      | FO-003.00            | FOUNDATION DETAILS 3   |                            | /ICE EQUIPMENT  |
| G-103.00             | ANSI GENERAL NOTES (CH. 504.7 - 609.3)                         | A-481.00             | RES. LAUNDRY ROOM PLAN & ELEVATIONS                                      | FO-101.00            | FOUNDATION & 1ST FLOOR FRAMING PLAN                                    | FS-01.00                   | FOOD SERVICE EQUIPMENT PLAN FLOOR PLAN  |
| G-104.00             | ANSI GENERAL NOTES (CH. 609.4 - 904.4.3)                       | A-483.00             | BICYCLE STORAGE PLAN   | FO-201.00            | FOUNDATION SECTIONS 1  | FS-02.00                   | FOOD SERVICE EQUIPMENT PLAN PLUMBING  |
| G-105.00<br>G-201.00 | ANSI GENERAL NOTES (CH. 904.5 - 1006.7) SURVEY                 | A-484.00<br>A-485.00 | RN SUPERVISOR /HEALTHCARE NAVIGATOR MISC. DETAILS                        | FO-202.00            | FOUNDATION SECTIONS 2  | FS-03.00<br>FS-04.00       | FOOD SERVICE EQUIPMENT PLAN ELECTRICAL FOOD SERVICE EQUIPMENT PLAN PLUMBING/ ELECTRICAL |
| G-201.00             | SULVET   | A-490.00             | SHELTER LOBBY PLAN & ELEVATIONS  | S-005.00             | TYPICAL DETAILS 1  | 1 3-04.00                  | SCHEDULES   |
| B-101.00             | BORING LOG I   | A-491.00             | SHELTER COMMONS PLAN & ELEVATIONS  | S-006.00             | TYPICAL DETAILS 2  | FS-05.00                   | FOOD SERVICE EQUIPMENT PLAN SPECIAL CONDITIONS  |
| B-102.00             | BORING LOG II  | A-492.00             | SHELTER LAUNDRY ROOM PLAN & ELEVATIONS                                   | S-007.00             | TYPICAL DETAILS 3  | FS-06.00                   | FOOD SERVICE EQUIPMENT UTILITY SCHEDULE   |
| B-103.00             | BORING LOG III   | A-493.00             | COMMERCIAL KITCHEN WINDOW DETAILS  | S-008.00             | TYPICAL DETAILS 4  | FS-07.00                   | FOOD SERVICE EQUIPMENT DETAILS  |
|                      |  | A-494.00             | MULTI-PURPOSE ROOM PLAN & ELEVATIONS                                     | S-009.00             | TYPICAL DETAILS 5  | 07 FIRE PROTE              |   |
| A-000.00             | SITE PLAN  | A-501.00             | WALL DETAILS I   | S-101.00             | 2ND FLOOR FRAMING PLAN   | SD-001.00                  | TEMPORARY STANDPIPE COVER PAGE  |
| A-101.00             | FIRST FLOOR - LAYOUT PLAN                                      | A-502.00             | WALL DETAILS II  | S-102.00             | 3RD FLOOR FRAMING PLAN   | SD-002.00<br>SD-100.00     | TEMPORARY STANDPIPE SITE PLAN TEMPORARY STANDPIPE 1ST FLOOR PLAN                        |
| A-102.00<br>A-105.00 | SECOND TO FOURTH FLOOR - LAYOUT PLAN FIFTH FLOOR - LAYOUT PLAN | A-503.00<br>A-504.00 | WALL DETAILS III WALL DETAILS IV   | S-103.00<br>S-104.00 | 4TH FLOOR FRAMING PLAN 5TH FLOOR FRAMING PLAN                          | SD-100.00<br>SD-101.00     | TEMPORARY STANDPIPE 2ND-4TH FLOOR PLAN  |
| A-106.00             | SIXTH FLOOR - LAYOUT PLAN                                      | A-505.00             | WALL DETAILS V   | S-104.00<br>S-105.00 | 6TH FLOOR FRAMING PLAN   | SD-102.00                  | TEMPORARY STANDPIPE 5TH FLOOR PLAN  |
| A-107.00             | SEVENTH TO EIGHTH FLOOR - LAYOUT PLAN                          | A-511.00             | TYPICAL EIFS DETAILS I   | S-106.00             | 7TH FLOOR FRAMING PLAN   | SD-103.00                  | TEMPORARY STANDPIPE 6TH FLOOR PLAN  |
| A-109.00             | ROOF - LAYOUT PLAN   | A-512.00             | TYPICAL EIFS DETAILS II  | S-107.00             | 8TH FLOOR FRAMING PLAN   | SD-104.00                  | TEMPORARY STANDPIPE 7TH-8TH FLOOR PLAN  |
| A-111.00             | FIRST FLOOR PLAN   | A-513.00             | TYPICAL STUCCO DETAILS   | S-108.00             | ROOF FRAMING PLAN  | SD-105.00                  | TEMPORARY STANDPIPE ROOF PLAN   |
| A-112.00             | SECOND TO FOURTH FLOOR PLAN                                    | A-514.00             | TYPICAL BRICK DETAILS  | S-109.00             | BULKHEAD FRAMING PLAN  | SD-200.00                  | TEMPORARY STANDPIPE RISER DIAGRAM   |
| A-115.00             | FIFTH FLOOR PLAN   | A-521.00             | EPDM ROOFING DETAILS   | S-201.00             | SCHEDULES  | SPSD-001.00                | SPRINKLER STANDPIPE NOTES, SYMBOLS & SCHEDULES  |
| A-116.00             | SIXTH FLOOR PLAN   | A-550.00             | TYPICAL INTERIOR DETAILS   | S-301.00             | SCHEDULES  | SPSD-002.00<br>SPSD-100.00 | SPRINKLER STANDPIPE SITE PLAN  1ST FLOOR - SPRINKLER STANDPIPE PLAN                     |
| A-117.00<br>A-119.00 | SEVENTH TO EIGHTH FLOOR PLAN ROOF PLAN                         | A-570.00<br>A-571.00 | TYPICAL AIR SEALING DETAILS  TYPICAL FIRESTOPPING DETAILS I              | S-401.00<br>S-402.00 | SHEAR WALL SCHEDULES SHEAR WALL DETAILS                                | SPSD-100.00<br>SPSD-101.00 | 2ND FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-119.00<br>A-121.00 | FIRST FLOOR - RCP  | A-571.00<br>A-572.00 | TYPICAL FIRESTOPPING DETAILS II  | 04 MECHANIC          |  | SPSD-102.00                | 3RD FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-122.00             | SECOND & THIRD FLOOR - RCP                                     | A-573.00             | TYPICAL FIRESTOPPING DETAILS III   | M-001.00             | MECHANICAL COVER SHEET   | SPSD-103.00                | 4TH FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-124.00             | FOURTH FLOOR - RCP   | A-600.00             | EXTERIOR WALL TYPES  | M-100.00             | MECHANICAL 1ST FLOOR PLAN  | SPSD-104.00                | 5TH FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-125.00             | FIFTH FLOOR - RCP  | A-610.00             | INTERIOR WALL TYPES  | M-101.00             | MECHANICAL 2ND-3RD FLOOR PLAN  | SPSD-105.00                | 6TH FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-126.00             | SIXTH FLOOR - RCP  | A-620.00             | DOOR SCHEDULE  | M-102.00             | MECHANICAL 4TH FLOOR PLAN  | SPSD-106.00                | 7TH FLOOR - SPRINKLER STANDPIPE PLAN  |
| A-127.00             | SEVENTH FLOOR - RCP  | A-622.00             | DOOR SADDLE DETAILS  | M-103.00             | MECHANICAL 5TH FLOOR PLAN  | SPSD-107.00<br>SPSD-108.00 | 8TH FLOOR - SPRINKLERSTANDPIPE PLAN ROOF - SPRINKLER STANDPIPE PLAN                     |
| A-128.00<br>A-141.00 | EIGHTH FLOOR & BULKHEAD - RCP FIRST FLOOR FINISH PLAN          | A-623.00<br>A-630.00 | DOOR HEAD & JAMB DETAILS WINDOW SCHEDULE & TYPES                         | M-104.00<br>M-105.00 | MECHANICAL 6TH FLOOR PLAN MECHANICAL 7TH FLOOR PLAN                    | SPSD-200.00                | SPRINKLER STANDPIPE RISER DIAGRAM   |
| A-141.00<br>A-142.00 | SECOND TO FOURTH FLOOR FINISH PLAN                             | A-631.00             | WINDOW SCHEDOLE & TYPES WINDOW DETAILS                                   | M-106.00             | MECHANICAL 7TH FLOOR PLAN  MECHANICAL 8TH FLOOR PLAN                   | SPSD-300.00                | SPRINKLER STANDPIPE DETAILS I   |
| A-145.00             | FIFTH FLOOR FINISH PLAN  | A-640.00             | STOREFRONT ELEVATIONS  | M-107.00             | MECHANICAL ROOF PLAN   |                            | SPRINKLER STANDPIPE DETAILS II  |
| A-146.00             | SIXTH FLOOR FINISH PLAN  | A-641.00             | STOREFRONT DETAILS   | M-108.00             | MECHANICAL BULKHEAD PLAN   | 08 ELECTRICAL              | L   |
| A-147.00             | SEVENTH TO EIGHTH FLOOR FINISH PLAN                            | A-660.00             | FINISH SCHEDULE  | M-200.00             | MECHANICAL AIR RISER DIAGRAM I   | E-001.00                   | ELECTRICAL SITE PLAN  |
| A-200.00             | WEST ELEVATION - BEACH CHANNEL DRIVE                           | A-670.00             | SECURITY DESK DETAILS I  | M-201.00             | MECHANICAL AIR RISER DIAGRAM II  | E-010.00                   | ELECTRICAL NOTES  |
| A-201.00             | SOUTH ELEVATION  | A-671.00             | SECURITY DESK DETAILS II   | M-202.00             | MECHANICAL AIR RISER DIAGRAM III                                       | E-011.00                   | ELECTRICAL SYMBOL LIST  |
| A-202.00             | EAST ELEVATION - REDFERN AVE.                                  | 02 LANDSCAP          |  | M-300.00             | MECHANICAL SCHEDULE I  | E-012.00<br>E-013.00       | ELECTRICAL - UNDERGROUND CONDUIT ROUTING  ELECTRICAL - 1ST FLOOR CONDUIT ROUTING        |
| A-203.00<br>A-204.00 | NORTH ELEVATION  PARTIAL ELEVATIONS                            | A-010.00             | LAYOUT AND MATERIALS PLAN - SOUTH PARKING LOT & MAIN ENTRANCE            | M-301.00<br>M-400.00 | MECHANICAL SCHEDULE II MECHANICAL DETAILS I                            | E-014.00                   | ELECTRICAL - 2ND FLOOR CONDUIT ROUTING  |
| A-205.00             | BULKHEAD ELEVATIONS  | A-011.00             | LAYOUT PLAN - NORTH SIDE YARD  | M-401.00             | MECHANICAL DETAILS II  | E-015.00                   | ELECTRICAL - 4TH FLOOR CONDUIT ROUTING  |
| A-301.00             | BUILDING SECTION A   | A-012.00             | MATERIALS PLAN - NORTH SIDE YARD   | M-402.00             | MECHANICAL DETAILS III   | E-016.00                   | ELECTRICAL - 5TH FLOOR CONDUIT ROUTING  |
| A-302.00             | BUILDING SECTION B   | A-013.00             | LAYOUT AND MATERIAL PLAN - 6TH FLOOR TERRACE                             | 05 PLUMBING          |  | E-017.00                   | ELECTRICAL - 6TH FLOOR CONDUIT ROUTING  |
| A-303.00             | BUILDING SECTION C   | A-020.00             | LIGHTING PLAN - SOUTH PARKING LOT & MAIN ENTRANCE                        | P-001.00             | PLUMBING NOTES, SYMBOLS AND SCHEDULES                                  | E-018.00                   | ELECTRICAL - 8TH FLOOR CONDUIT ROUTING  |
| A-311.00             | WALL SECTIONS I  | A-021.00             | LIGHTING PLAN - NORTH SIDE YARD  | P-002.00             | PLUMBING SITE PLAN   | E-019.00                   | ELECTRICAL - ROOF CONDUIT ROUTING   |
| A-312.00             | WALL SECTIONS II   | A-030.00             | IRRIGATION PLAN - SOUTH PARKING LOT & MAIN ENTRANCE                      | P-099.00             | UNDERGROUND PLUMBING PLAN  | E-100L.00                  | ELECTRICAL - 1ST FLOOR LIGHTING PLAN  |
| A-313.00             | WALL SECTIONS III  | A-031.00<br>A-032.00 | IRRIGATION PLAN - NORTH SIDE YARD IRRIGATION PLAN - 6TH FLOOR TERRACE    | P-100.00             | 1ST FLOOR - PLUMBING PLAN  | E-100P.00<br>E-101L.00     | ELECTRICAL - 1ST FLOOR POWER PLAN ELECTRICAL - 2ND & 3RD FLOOR LIGHTING PLAN            |
| A-351.00             | STAIR A PLANS & SECTIONS STAIR B PLANS & SECTIONS I            | A-040.00             | PLANTING PLAN - SOUTH PARKING LOT & MAIN ENTRANCE                        | P-101.00             | 2ND FLOOR - PLUMBING PLAN  | E-101E.00                  | ELECITRICAL - 2ND & 3RD FLOOR EIGHTING FLAN   |
| A-352.00<br>A-353.00 | STAIR B PLANS & SECTIONS II                                    | A-041.00             | PLANTING PLAN - NORTH SIDE YARD  | P-102.00<br>P-103.00 | 3RD FLOOR - PLUMBING PLAN 4TH FLOOR - PLUMBING PLAN                    | E-102L.00                  | ELECTRICAL - 4TH FLOOR LIGHTING PLAN  |
| A-354.00             | STAIRS C,D PLANS & SECTIONS                                    | A-042.00             | PLANTING PLAN - 6TH FLOOR TERRACE  | P-103.00             | 5TH FLOOR - PLUMBING PLAN  | E-102P.00                  | ELECTRICAL - 4TH FLOOR POWER PLAN   |
| A-355.00             | STAIRS TYP. SECTIONS AND DETAILS                               | A-050.00             | PAVING & METAL PLANTER DETAILS   | P-105.00             | 6TH FLOOR - PLUMBING PLAN  | E-103L.00                  | ELECTRICAL - 5TH FLOOR LIGHTING PLAN  |
| A-380.00             | ELEVATOR SECTIONS & PLANS                                      | A-051.00             | RAMP & STAIR DETAILS   | P-106.00             | 7TH FLOOR - PLUMBING PLAN  | E-103P.00                  | ELECTRICAL - 5TH FLOOR POWER PLAN   |
| A-381.00             | TYPICAL ELEVATOR DETAILS                                       | A-052.00             | FENCE AND BARRIER RAIL DETAILS   | P-107.00             | 8TH FLOOR - PLUMBING PLAN  | E-104L.00                  | ELECTRICAL - 6TH FLOOR LIGHTING PLAN  |
| A-390.00             | TRASH ROOM PLAN AND DETAILS                                    | A-053.00             | GATE DETAILS   | P-108.00             | ROOF - PLUMBING PLAN   | E-104P.00                  | ELECTRICAL - 6TH FLOOR POWER PLAN   |
| A-401.00             | ENLARGED UNIT PLANS I  | A-054.00<br>A-055.00 | FURNISHING DETAILS FURNISHING DETAILS                                    | P-200.00             | PLUMBING SANITARY RISER DIAGRAM I                                      | E-105L.00<br>E-105P.00     | ELECTRICAL - 7TH & 8TH FLOOR LIGHTING PLAN  ELECTRICAL - 7TH & 8TH FLOOR POWER PLAN     |
| A-402.00             | ENLARGED UNIT PLANS II   | Λ-033.00             | 1. O. MIOLINIO DE IVILO  | P-201.00<br>P-202.00 | PLUMBING SANITARY RISER DIAGRAM II PLUMBING SANITARY RISER DIAGRAM III | E-105F.00                  | ELECTRICAL - 71H & 81H FLOOK FOWER FLAN   |
|                      |  |                      |  | 1 -202.00            | I FOMDING OVINITALL LIGHT DIVOLVIM III                                 | 2 .002.00                  |   |

| E-107.00    | ELECTRICAL - ROOF POWER PLAN                              |
|-------------|---|
| E-107.00    | ELECTRICAL - BULKHEAD POWER PLAN                          |
| E-200.00    | ELECTRICAL POWER RISER DIAGRAM                            |
| E-201.00    | ELECTRICAL FEEDERS LEGEND                                 |
| E-202.00    | ELECTRICAL APARTMENT RISER DIAGRAM SHEET NO.1             |
| E-203.00    | ELECTRICAL APARTMENT RISER DIAGRAM SHEET NO.2             |
| E-204.00    | ELECTRICAL TELECOM RISER DIAGRAM RESIDENT SHEET NO.1      |
| E-205.00    | ELECTRICAL TELECOM RISER DIAGRAM RESIDENT SHEET NO.2      |
| E-206.00    | ELECTRICAL CCTV, CR AND IC RISER DIAGRAMS RESIDENT        |
| E-207.00    | ELECTRICAL TELECOM, CCTV, CR AND IC RISER DIAGRAMS SHELTE |
| E-300.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.1                    |
| E-301.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.2                    |
| E-302.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.3                    |
| E-303.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.4                    |
| E-304.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.5                    |
| E-305.00    | ELECTRICAL PANELS SCHEDULES SHEET NO.6                    |
| E-400.00    | ELECTRICAL DETAILS SHEET NO.1                             |
| E-401.00    | ELECTRICAL DETAILS SHEET NO.2                             |
| E-402.00    | ELECTRICAL KITCHEN PART PLAN                              |
| E-403.00    | ELECTRICAL - 1ST FLOOR LANDSCAPE LIGHTING PLAN            |
| 9 FIRE ALAF | RM  |
| FA-010.00   | SPRINKLER/SMOKE ALARM SYSTEM NOTES RESIDENTIAL            |
| FA-011.00   | SPRINKLER/SMOKE ALARM SYSTEM RISER DIAGRAM RESIDENTIAL    |
| FA-012.00   | SPRINKLER/SMOKE ALARM SYSTEM MATRIX RESIDENTIAL           |
| FA-020.00   | FIRE ALRM SYSTEM NOTES SHELTER                            |
| FA-021.00   | FIRE ALARM SYSTEM RISER DIAGRAM SHELTER                   |
| FA-022.00   | FIRE ALARM SYSTEM MATRIX SHELTER                          |
| FA-100.00   | SPRINKLER/SMOKE ALARM SYSTEM 1ST FLOOR PLAN RESIDENTIAL   |
| FA-101.00   | SPRINKLER/SMOKE ALARM SYSTEM 2ND FLOOR PLAN RESIDENTIAL   |
| FA-102.00   | SPRINKLER/SMOKE ALARM SYSTEM 3RD FLOOR PLAN RESIDENTIAL   |
| FA-103.00   | SPRINKLER/SMOKE ALARM SYSTEM 4TH FLOOR PLAN RESIDENTIAL   |
| FA-104.00   | SPRINKLER/SMOKE ALARM SYSTEM 5TH FLOOR PLAN RESIDENTIA    |
| FA-105.00   | SPRINKLER/SMOKE ALARM SYSTEM 6TH FLOOR PLAN RESIDENTIAL   |
| FA-106.00   | SPRINKLER/SMOKE ALARM SYSTEM 7TH FLOOR PLAN RESIDENTIAL   |
| FA-107.00   | SPRINKLER/SMOKE ALARM SYSTEM 8TH FLOOR PLAN RESIDENTIAL   |
| FA-108.00   | SPRINKLER/SMOKE ALARM SYSTEM ROOF PLAN RESIDENTIAL        |
| FA-109.00   | SPRINKLER/SMOKE ALARM SYSTEM BULKHEAD PLAN RESIDENTIAL    |
| FA-200.00   | FIRE ALARM SYSTEM 1ST FLOOR PLAN SHELTER                  |
| FA-201.00   | FIRE ALARM SYSTEM 2ND FLOOR PLAN SHELTER                  |
| FA-202.00   | FIRE ALARM SYSTEM 3RD FLOOR PLAN SHELTER                  |
| FA-203.00   | FIRE ALARM SYSTEM 4TH FLOOR PLAN SHELTER                  |
| FA-204.00   | FIRE ALARM SYSTEM 5TH FLOOR PLAN SHELTER                  |

**Beach Channel Drive** <sup>2</sup> 13-12 Beach Channel Drive, Far Rockaway, NY 11691 BRC & CPG Consultants STRUCTURAL ENGINEER GACE Consulting Engineers

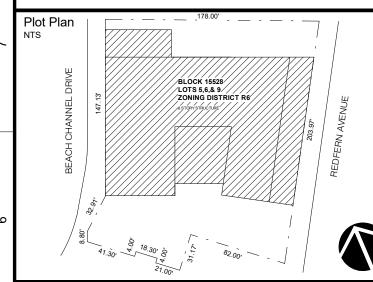
105 Madison Avenue, Floor 6, New York, NY 10016 MEP ENGINEER

Skyline Engineering
42 West 39th Street, Floor 10, NY 10018

Krypton Engineering 527 W 48th Street, Ground Floor, New York, NY LANDSCAPE ARCHITECT

Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215

CODE CONSULTANT William Vitacco Associates Ltd. 299 Broadway, 5th Floor, New York, NY 10007



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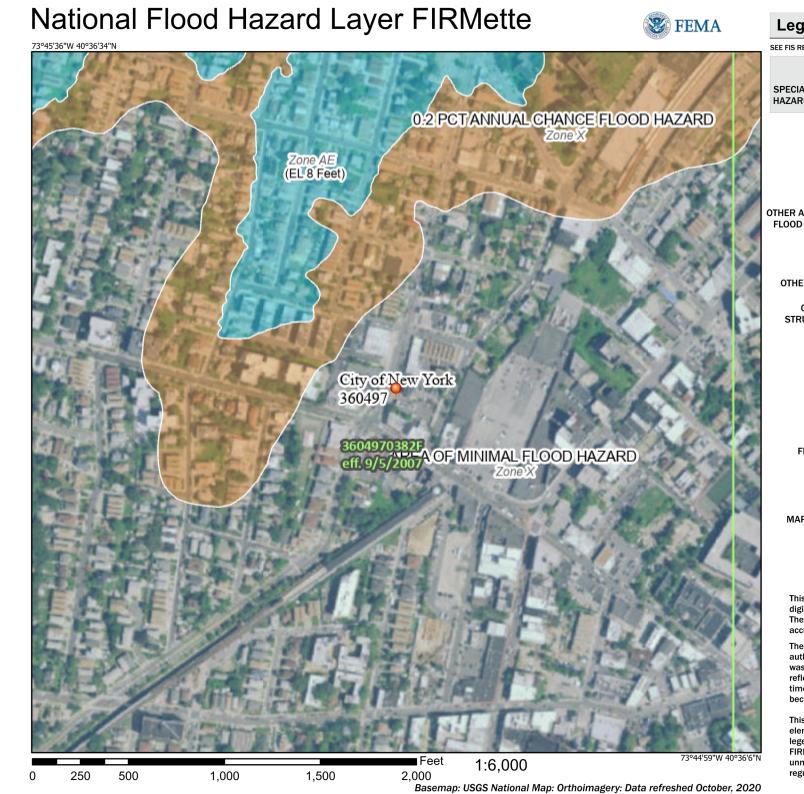
|   |     | Issuance Schedule |             |  |  |  |  |  |  |
|---|-----|-------------------|-------------|--|--|--|--|--|--|
| 4 | No. | Date              | Description |  |  |  |  |  |  |
|   | 2   | 08/13/21          | 50% CD      |  |  |  |  |  |  |
|   | 3   | 10/29/21          | 90% CD      |  |  |  |  |  |  |
|   | 4   | 12/10/21          | 100% CD     |  |  |  |  |  |  |
|   |     |                   |             |  |  |  |  |  |  |
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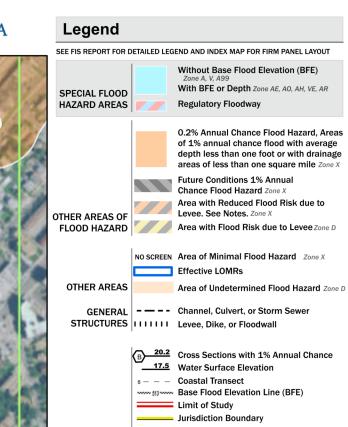
COVER

Sign & Seal T-000.00 Author Checker

| applicable Resolutio                          | - CAMBER / BRC - BEAC   |   | _   |  |   |                                       | <u> </u>  | 11/19/202                        |
|---|---|---|---|--|---|---------------------------------------|---|----------------------------------|
| • •   | Zoning Resolution of the City of                                    | New York, Latest Addition                         | on. All referer   | nces below, denoted as 2                           | ZR reference this resolution.                   |                                       |   |                                  |
| Basic Property Data:                          | :<br>13-12 to 13-24 Beach Channe                                    | I Drive Queens NY 11                              | 601   |  |   |                                       |   |                                  |
| Borough:                                      |   | Block:  |   | Lot(s):  | 5,6,9   | CB:                                   | 414   |                                  |
|   | 168' on Beach Channel Drive; 2                                      | 205' on Redfern Avenue                            |   | Lot Depth:   | varies from 178' to 155'                        |                                       |   |                                  |
| Zoning Map:<br>Lot Area:                      | Throught Lot:   | 29,784.50 SF                                      | Interior Lot:   | 2,461.51 SF  |   |                                       |   |                                  |
|   | 32,246.01 SF  |   |   |  |   |                                       |   | Per Surve                        |
| District:                                     | R6  Downtown Far Rockaway Spec                                      | ial District                                      |   |  |   |                                       |   | Zoning Map 25l<br>Zoning Map 25l |
| Sub District:                                 | C2-4 overlay  |   |   |  |   |                                       |   |                                  |
|   | Yes - Mandatory Inclusionary Ho<br>Yes (Lots 5. 9 only - E-415, CEC |   |   |  | F); Complies per Option 1 of ZI                 | R 23-154(d)(3)(i)                     |   |                                  |
| Transit Zone:                                 | <u> </u>  | <u></u>   | 1010 7 201011   |  |   |                                       |   | ZR Appendix                      |
| Notes:  | Area is in a Moderate to Low Ri                                     | sk Flood Zone X (See E                            | ffective Flood  | d Map)   |   |                                       |   |                                  |
| Jse Regulations                               |   |   |   |  |   |                                       |   |                                  |
| ZR Section                                    | Title   | Required / Permitted                              |   | Proposed / Provided UG 2 - Multi-family Residences |   | Notes and Complian                    | ce  |                                  |
| ZD 22 40 / ZD 22 40 /                         | LICES DEDMITTED AS OF   |   |   |  | UG 3A - Philanthropic or non-pr                 |                                       | COMPLIES  |                                  |
| ZR 22-10 / ZR 32-10 /<br>ZR 136-10            | USES PERMITTED AS-OF-<br>RIGHT                                      | R6 UG 1 to 4                                      |   | UG 1 to 4  | sleeping accommodations (boshelter components). | oth supportive housing and            | COMPLIES  |                                  |
|   |   |   |   | UG 4 - Community Facility                          |   | COMPLIES                              |   |                                  |
| Bulk Regulations:<br>ZR Section               | Title   | Pog   | uired / Perm  | ittod  | Proposed  | / Provided                            | Notes and Complian  |                                  |
| -ix Occuoii                                   | Title   | Keq   | FAR   |  | FAR   | , , , , , , , , , , , , , , , , , , , | Notes and Compilan  |                                  |
|   |   | UG 4:   | 4.80  | 154,781 SF max                                     | 0.04  | 1,238.59 SF                           | UG 4  |                                  |
| ZR 24-111 (b) / ZR 23-<br>154 (b) / ZR 24-161 | FLOOR AREA  |   |   |  | 1.06  | 34,057.57 SF                          | UG 3A - Shelter   |                                  |
|   |   | UG 3:   | 2.43  | 78,358 SF max                                      | 1.25  | 40,295.69 SF                          | UG 3A - Supportive Housing                                      |                                  |
| 70.04.407                                     |   | UG 2:   | 3.60  | 116,086 SF max                                     | 1.25  | 40,165.57 SF<br>115,757.42 SF         | UG 2 - Mandatory Inclusionary Housing                           |                                  |
| ZR 24-161<br>ZR 24-11                         |   | UG 3 + UG 4                                       | 3.60<br>65%   | 116,086 SF max<br>20,959.91 SF                     | 3.59<br>62%                                     | 20,136.00 SF                          |   | Total - COMPLIE                  |
| ZR 23-153                                     |   | UG 2 - MIH  | 65%   | Inte   | erior Lot + Shallow through lot;                | see below                             | See Lot Coverage Dia  | gram - COMPLIE                   |
| 0   |   | @ Interior Lot                                    |   | 1,599.98 SF  | 0%  | 0.00 SF                               | Through Let Death C. Coolet                                     | Coverage Diagram                 |
| ZR 23-156                                     | LOT COVERAGE  | LC for shallow through lots                       | 68%   | 20,253.46 SF                                       | 68%   | 20,136.00 SF                          | Through Lot Depth @ See Lot midpiont = 163.80'                  | Coverage Diagram  COMPLIE        |
|   | LOT GOVERAGE  | Total LC  | 68%   | 21,853.44 SF                                       | 62%   | 20,030.05 SF                          | See Lot Coverage Dia  |                                  |
| ZR 24-12                                      |   | may be excluded in dete                           | ermining the  | lot coverage set forth in                          |   |                                       |   |                                  |
| ZR 23-12 / ZR 23-44                           |   | Permitted Obstructions                            | in Open Spa   | ce & Required Yards - A                            | wnings / Canopies, Porches,T                    | erraces, Trellises, Fences, Ex        | erior Wall Thickness, Accessory Parking                         | Spaces, ex                       |
| ZR 136-21                                     |   | Residential portion of a<br>116086 – 1239 – 3408  |   | • •  | um lot coverage of the underlyi                 | •                                     | ildings   |                                  |
| ZR 23-22 / ZR 23-24<br>ZR 24-34               | DENSITY REGULATIONS   | 680 (Density Fa                                   | ctor)   | = 60 Max. Units  Not Required                      | 60 Units TBD                                    |                                       | Sag Sit   | COMPLIE<br>e Plan - COMPLIE      |
| ZR 24-351                                     |   | Side Yard:  | 8' required   | d at side yard bounding                            |   | <i>r</i> ided                         |   | e Plan - <b>COMPLIE</b>          |
| ZR-24-382 /                                   | YARD REGULATIONS  |   |   | district to north                                  | I 0' midway between street lines                | two open areas with                   |   |                                  |
| ZR-33-283                                     | 7.1.12 1.120027.110110  | Rear Yard Equivalents                             |   |  | with 30' depth along side lot lin               |                                       |   | e Plan - <b>COMPLIE</b> :        |
| ZR 23-534                                     |   | Rear Yard Equivalent of 20' deep for              |   |  | Varies, min. 20' pro                            | vided. See site plan.                 | 178.02' + 160.73' = 169.37 avg. 2 lot depth                     | COMPLIE                          |
|   |   | 70% of the aggregate w                            | of 20' deep for lots less than 180' deep  70% of the aggregate width of street walls shall be located within 8' of the street line, extending to at least the minimum |  | e Street Wall is within 8' of the               |                                       | o Dion COMPLIE  |                                  |
| ZR 136-221a                                   | STREET WALL LOCATION  | base height.                                      | e, exteriding   | to at least the minimum                            | street line                                     |                                       | See Site Plan - COMPLIE   |                                  |
| 211 100 22 10                                 |   | For zoning lots bounded street wall location requ | •   |  | Street wall provided or                         | n Redfern Avenue only.                | See Site Plan - <b>COMPLIE</b>                                  |                                  |
|   |   | one street line.  Min. Base Height                | Ι   | 30.00'   |   |                                       |   |                                  |
| ZR 136-222                                    |   | Max. Base Height                                  |   | 55.00'   |   | 54.42'<br>54.42'                      |   | COMPLIE                          |
| ZR 150-222                                    | MAXIMUM HEIGHT OF WALLS AND REQUIRED                                | Min and max base height required to comply with   |   | to those street walls                              |   | etbacks provided on Redfern e only.   |   | COMPLIE                          |
| ZR 136-223                                    | SETBACKS (QUALITY HOUSING)  | Max. Building Height                              |   | 5.00' / 9 stories                                  |   | 8 stories                             |   | COMPLIE                          |
| ZR 24-50                                      |   | If the residential portion                        | of a building   | containing a community                             | r facility use is developed pursu               | ant to QH, entire building shal       | comply with QH height and setback regu                          |                                  |
| Quality Housing Reg                           | ulations:   |   |   |  |   |                                       |   |                                  |
| 28-12   | REFUSE STORAGE  | Residential + Supportive Housing                  |   | per dwelling unit<br>7 units = 426.3 cu. ft.       | 715 SF x 8 FT = 5720 cu. ft.                    | 12 SF deducted per floor              |   | COMPLIE                          |
| ۷0-12   | NEI OOL GTONAGE   | Shelter   |   | 30 units = 87 cu. ft.                              | 148 SF x 8 FT = 1184 cu. ft.                    | 12 or deducted per 1100f              |   |                                  |
| 28-13   | LAUNDRY FACILITIES  |   | 147 / 20 =<br>147 / 40 =  |  |   | 230 SF deducted                       | Proposed layout complies with all other requirments of ZR 28-13 | COMPLIE                          |
| 00.44   | DAM IOUT III COTTITUTE  | 50% of corridor may be dec                        | ducted if 20 SF   | min. window (a) visible                            |   | see plan                              |   | <b></b>                          |
| 28-14   | DAYLIGHT IN CORRIDORS   | from 50% of corridor or from yard or court        |   |  | 50% of all residentia                           | ii corridors deducted                 | See area calculations on Z-102                                  | COMPLIES                         |
| 28-21   | REQUIRED RECREATION SPACE   | 1 3 30%   |   | al floor area or<br>omm. Fac. Area                 | 3.3% x 114519 SF =<br>2,655.22 SF               | 1,744 SF deducted                     | See area calculations on Z-102                                  | COMPLIES                         |
| Parking Regulations                           | 1   |   |   |  |   |                                       |   |                                  |
| ZR Section                                    | Title   | -   | uired / Perm  | itted  |   | / Provided                            | Notes and Complian All units are income restricted including    | ce                               |
| ZR 25-251                                     | Required Accessory Off-Street                                       | Income Restricted<br>Housing                      |   | 25%  | 60 units X 25%                                  | = 15 spaces provided on site          | MIH designated units. All parking spaces provided on-site.      | COMPLIE                          |
| ZR 25-251<br>ZR 25-261                        | Parking Spaces (UG 2)   | Waiver  |   | R6 zone  | Up to 5 per                                     | ZR 25-261                             | Waiver not applied  | COMPLIE                          |
|   | Required Accessory<br>Off-Street                                    | Philanthropic or non-<br>profit institutions with |   | per 20 Beds  | Waived per ZR 25-33 for s                       | •                                     |   | COMPLIE                          |
| 7D 05 04 / 7D 05 55                           | Parking Spaces (UG 3)   | ni-Street   287 beds                              |   | = 15   | prov  | rided                                 |   | CONFLIE                          |
| ZR 25-31 / ZR 25-33                           | Required Accessory  | Philanthropic or non-                             |   | per 20 persons                                     | Waived per 7R 25-33 for s                       | paces below 25, thus none             |   |                                  |
|   | Off-Street Parking Spaces (UG 4)                                    | profit institutions without sleeping              | <u>12</u><br>20   | = 1  | ·   | paces below 25, thus none<br>rided    |   | COMPLIE                          |
| ZR 25-62                                      | Size and Location of Spaces   | accommodations Min. 300                           | SF per park   | I<br>ing space                                     | 6,102 SF / 15 =                                 | 406.8 SF per space                    |   | COMPLIE                          |
| ZR 25-811 /                                   |   | UG 2  | ·   | r 2 dwelling units                                 | 3   | 0                                     |   | COMPLIE                          |
| ZR 36-711                                     | Bicycle Parking   | UG 3 1 per 10,000 SF                              |   | 8  |   |                                       | COMPLIE   |                                  |
| pecial Urban Desig                            | n Guidelines - Street Tree Pl                                       | anting UG 4                                       | <u> </u>  | per 10,000 SF                                      |   | J                                     | 1   | COMPLIE                          |
| R Section                                     | Title   | Required / Perm                                   | nitted  |  | Proposed / Provided                             |                                       | Notes and Complian  | ce                               |
| <b>7</b> D 00 00 /                            |   | 8.92' + 32.88' + 147.13                           | 3' + 203.97'  |  | Existing to remain  Existing to Be relocated    | 0                                     | -   |                                  |
| ZR 23-03 /<br>ZR 24-05 /                      | Street Tree Planting  | =   | 392.90 LF   |  | New On-Site Trees                               | 10                                    |   | COMPLIE                          |
| 70 00 11                                      |   | 392.90 LF   |   |  | Off-Site Trees 6                                |                                       |   |                                  |
| ZR 26-41                                      |   | 392.90 LF<br>25' LF per tree                      | = 16  |  | Total Trees                                     | 16                                    | 1   |                                  |

## EFFECTIVE FIRM





OTHER FEATURES

OTHER FEATURES

Profile Baseline
Hydrographic Feature

Digital Data Available
No Digital Data Available
Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

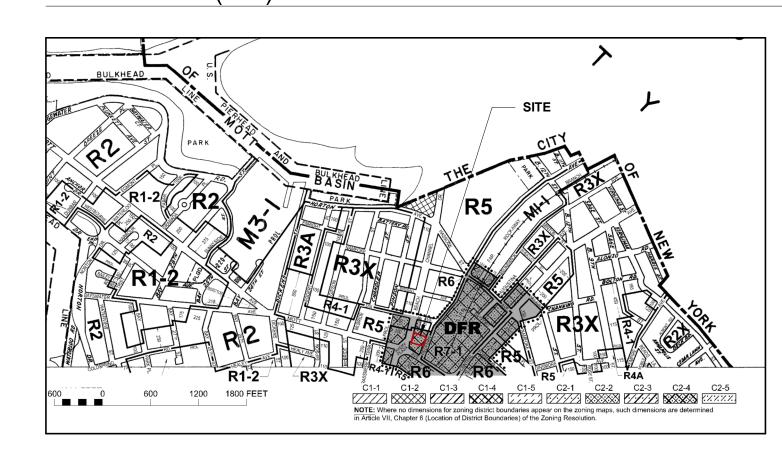
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below.
The basemap shown complies with FEMA's basemap

accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/8/2021 at 4:26 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

## ZONING MAP (25b)



## TAX MAP



Project

## Beach Channel Drive

<sup>≅</sup> 13-12 Beach Channel Drive, Far Rockaway, NY 11691

BRC & CPG



Consultants
STRUCTURAL ENGINEER

GACE Consulting Engineers

105 Madison Avenue, Floor 6, New York, NY

10016

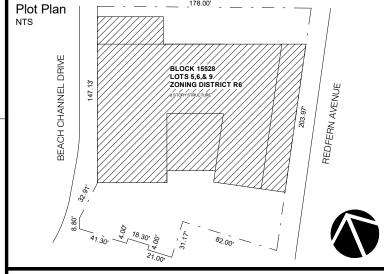
Skyline Engineering
42 West 39th Street, Floor 10, NY 10018
CIVIL ENGINEER

Krypton Engineering
527 W 48th Street, Ground Floor, New York, NY

LANDSCAPE ARCHITECT

Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215

William Vitacco Associates Ltd.
299 Broadway, 5th Floor, New York, NY 10007

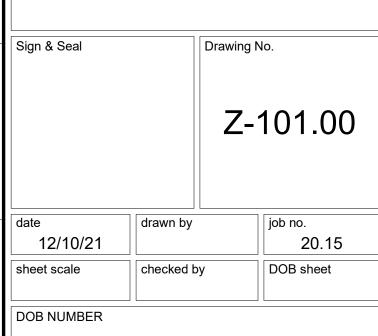


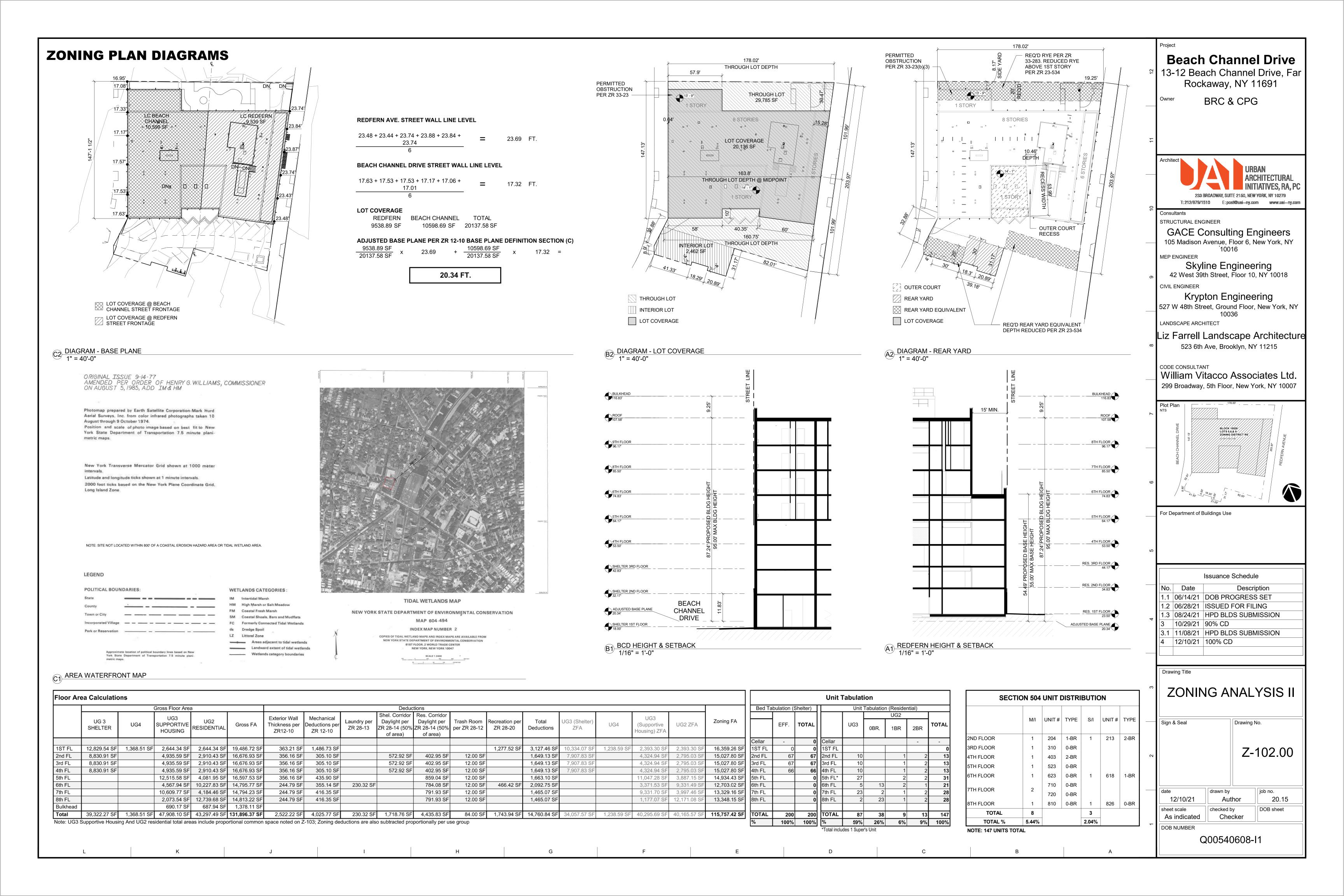
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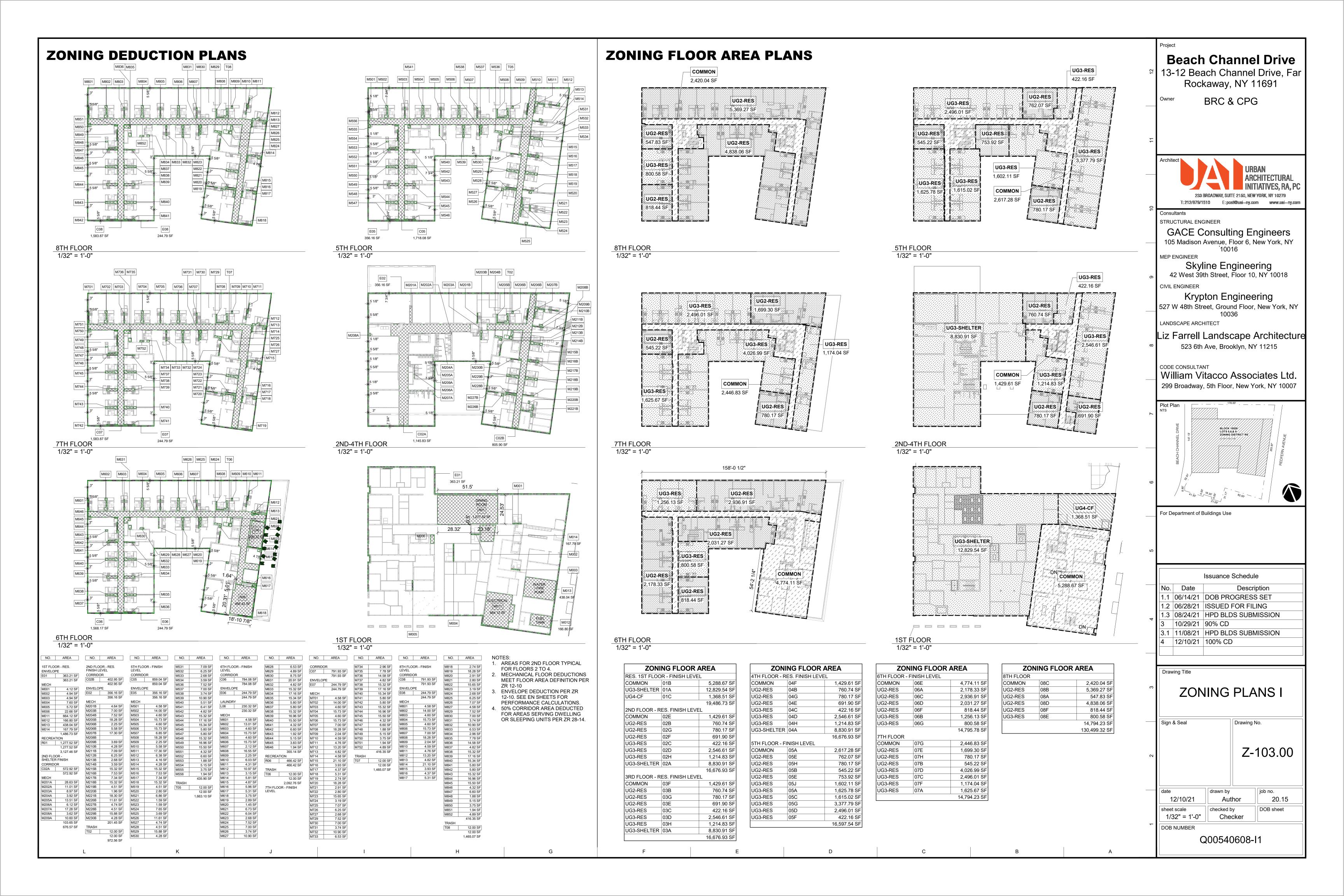
| Issuance Schedule |                               |  |  |  |  |
|-------------------|-------------------------------|--|--|--|--|
| No.               | Date                          | Description  |  |  |  |
| 1.1               | 06/14/21                      | DOB PROGRESS SET   |  |  |  |
| 1.2               | 06/28/21                      | ISSUED FOR FILING  |  |  |  |
| 1.3               | 08/24/21                      | HPD BLDS SUBMISSION  |  |  |  |
| 3                 | 10/29/21                      | 90% CD   |  |  |  |
| 3.1               | 11/08/21                      | HPD BLDS SUBMISSION  |  |  |  |
| 4                 | 12/10/21                      | 100% CD  |  |  |  |
|                   |                               |  |  |  |  |
|                   | •                             |  |  |  |  |
|                   | 1.1<br>1.2<br>1.3<br>3<br>3.1 | 1.1 06/14/21<br>1.2 06/28/21<br>1.3 08/24/21<br>3 10/29/21<br>3.1 11/08/21 |  |  |  |

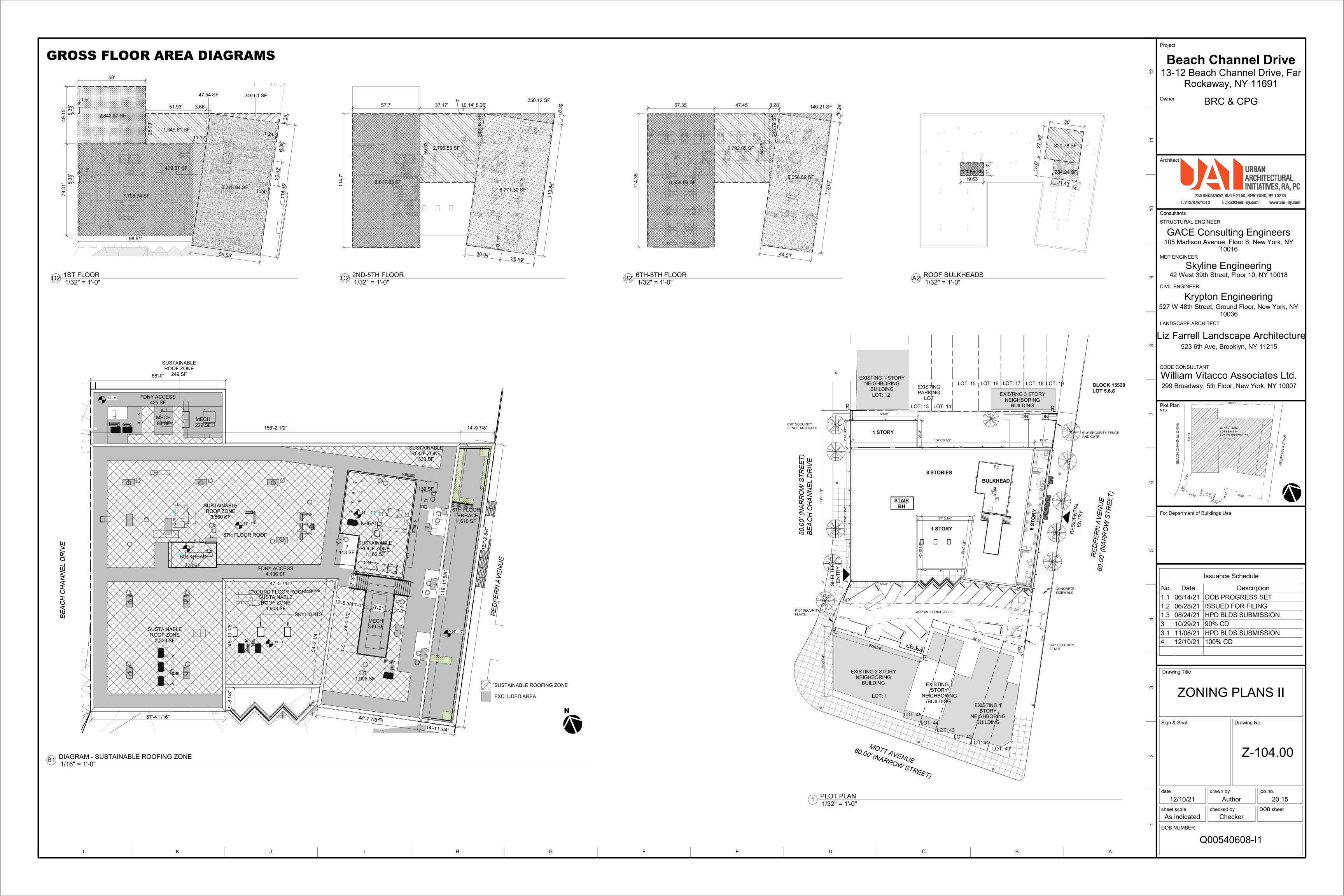
Drawing Title

## **ZONING ANALYSIS I**









**APPLICABLE CODE:** -Building code of the City of New York - 2014 - Latest Edition NOTE: All numbers noted after listings -New York City Energy Conservation Code (NYCECC) - 2020 refer to section numbers from this -Cabo/ ANSI A117.1- 2009 document. FIRE DISTRICT: The property is located within a fire district (BC D105) **OCCUPANCY CLASSIFICATION:** ASSEMBLY - CAFETERIA R-2 APARTMENT HOUSES (CLASS A MULTIPLE **BUSINESS - OFFICES** DWELLING) CONGREGATE LIVING UNITS - HOMELESS SHELTER SPECIAL DETAILED REQUIREMENTS BASED ON **USE AND OCCUPANCY: (CHAPTER 4) SEPARATION OF OCCUPANCIES:** (CHAPTER 5) INCIDENTAL USE AREAS (TABLE 509)
ROOM OR AREA SEPARATION REQ. MIN. PROVIDED 1 HOUR **COMPLIES** Rooms with a high pressure steam or water boiler that 2 HR OR 1 HR W/ AUTOMATIC exceeds 350KBtu per hour input SPRINKLER SYSTEM Rooms with a high pressure steam or water boiler that is 1 HR OR AUTOMATIC 1 HOUR **COMPLIES** 350 KBtu per hour input or less SPRINKLER SYSTEM Rooms containing fire pumps in high-rise buildings 1 HOUR **COMPLIES** Laundry rooms over 100 square feet 1 HR OR AUTOMATIC 1 HOUR **COMPLIES** FIRE-EXTINGUISHING SYSTEM 1 HOUR Waste and linen collection rooms over 100 square feet 1 HR OR AUTOMATIC **COMPLIES** FIRE-EXTINGUISHING SYSTEM MIXED OCCUPANCIES: BC508.1 EXCEPTION 4: here not identified in Table 509, mechanical and/or electrical equipment rooms (BC 508) shall be permitted to be classified as the occupancy within which they are located, or at the option of the BC 508.2 ACCESSORY OCCUPANCIES - Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4. ASSEMBLY AREAS HAVING A FLOOR AREA LESS THAN 750 SF ARE CONSIDERED ACCESSORY OCCUPANCY PER BC 508.2.1 EXC. 1.1. BC 508.2.4 Separation of occupancies. No separation is required between accessory occupancies and the main TABLE BC 508.4 SEPARATED OCCUPANCIES (SPRINKLERED) A B R A N 1HR 1HR -- N 1HR SPECIAL PROVISIONS: BC 510.10 Separation of different tenancies. Spaces or dwelling units occupied by different tenants shall be separated by fire barriers having at least 1-hour fire-resistance ratings. (BC 510) TYPE OF CONSTRUCTION: IB (Table 601) (CHAPTER 6) Table 503 IB allows unlimited stories and floor area for all proposed occupancies **REQUIRED FIRE RESISTANT ELEMENT:** Min. PROVIDED/HOURS: **CONSTRUCTION:** PRIMARY STRUCTURAL FRAME 2 hour(s) BEAMS - COLUMNS, EXCEPT **COMPLIES** 2 / 3 hour Including Columns, girders, trusses FOR ROOF SUPPORT TO BE 3 HRS PER SFRM MINIMUM 403.2.1 BONDSTRENGTH: 430 psf BEARING WALLS EXTERIOR: 2 hour 2 hour **COMPLIES** INTERIOR: 2 hour 2 hour FLOOR CONSTRUCTION 2 hour 2 hour **COMPLIES** 8" CMU **ROOF CONSTRUCTION &** 1 hour 1 hour **COMPLIES** SECONDARY MEMBERS **NON-BEARING EXTERIOR WALLS:** 8" PLANK + 2" TOP **COMPLIES** SEPARATION DISTANCE: <5' 8" PLANK + 2" TOP SEPARATION DISTANCE: 5 to <10' **COMPLIES** SEPARATION DISTANCE: 10 to < 30' **NOT APPLICABLE** SEPARATION DISTANCE: >30' 0 hour **NOT APPLICABLE** FIRE-RESISTANCE- RATED CONSTRUCTION: (CHAPTER 7) 708.2- Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft SHAFT ENCLOSURES: (BC708) enclosure complying with this section. Exceptions: 2.A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway which is not a portion of the means of egress protected according to Item 2.1 or 2.2: 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13, as modified in Appendix Q. In other than Groups B and M, this application is limited to openings that do not connect more than four stories. 8.A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively. 708.4- Fire-resistance rating Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where penetrating three stories or more and not less than 1 hour where penetrating fewer than three stories. The number of stories connected by the shaft enclosure shall include any basements or cellars, but not any mezzanines. Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2. 708.12.1- Smoke venting of stair and other closed shafts. All closed shafts, including vertical exit enclosures, having a floor area exceeding 4 square feet shall be provided with a smoke vent in accordance with Sections 708.12.1.1 through 708.12.1.3. **INTERIOR FINISHES:** (CHAPTER 8) Fire Alarm System without Notification Appliances per BC section 907.2. FLAME SPREAD RATING: INTERIOR FLAME SPREAD SMOKE DEVELOPED LOCATION (803.1.1.1 - 3)FINISH CLASS | RATING RATING A 0 TO 25 EXIT & CORRIDORS 25 OR LESS OCC. GROUP I 50 OR LESS ROOMS IN WHICH THE 100 OR LESS C 76 TO 200 NET FLOOR AREA PER OCCUPANT IS 10 SF OR LESS INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY: **OCCUPANCY GROUPS** (TABLE 803.5) SPRINKLERED AREAS A-2 B R-1 R-2 VERTICAL AND EXIT PASSAGEWAYS B B B **CORRIDORS ROOMS & ENCLOSED SPACES EXIT AND ACCESS REQUIREMENTS:** Sprinklered Building - IB Construction Class (CHAPTER 10) Assembly Unconcentrated Table & Chairs: 15 SF Net /Occ. Occupancy loads 100 SF Gross (Table 1004.1.1): Business Areas: /Occ. Dormitories: 50 SF Gross /Occ. 200 SF Gross Kitchen, commercial /Occ. 200 SF Gross /Occ. Residential: Accessory Storage/ Mech. Rooms: 300 SF Gross Occupancy Stairways Other Components \*See Floor Plans For Calculations Egress Width per Occupancy Other than H 0.3" / Occ. Occupant Served: (BC 0.2" / Occ. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity

Exit and Exit Access Doorways 1015.1 Exits or exit access doorways from spaces. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists: 1. The occupant load of the space exceeds one of the values in Table 1015.1. 2. The common path of egress travel exceeds one of the limitations of Section 1014.3. 3. Where required by Section 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1. TABLE 1015.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY OCCUPANCY MAXIMUM OCCUPANT LOAD A, B, Ea, M, U 1015.1.1 Three or more exits or exit access doorways. Three exits or exit access doorways shall be provided from any space with an occupant load of 501 to 1.000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000. Exit Access Travel Distance <u>OCCUPANCY</u> Primary Exit < 150'-0" \*Primary Exit < 150'-0" **COMPLIES** (Table 1028.7) \*Seconday Exit < 250'-0" Secondary Exit < 250'-0" (Table 1016.1 - w/ sprinkler) 300'-0" max. \*LESS THAN 300'-0" <u>COMPLIES</u> **COMPLIES** 200'-0" max. \*LESS THAN 200'-0" \* Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 Corridors 1018.1 Construction, Corridors shall be constructed in accordance with this section. Interior corridor walls required to be fire-resistance rated shall comply with Section 709 for fire partitions. Public corridor walls shall comply with Section 707 for fire barriers. TABLE 1018.1.2 PUBLIC CORRIDOR FIRE-RESISTANCE RATING Occupancy A, B, R (noncombustible ) - Minimum 1 Hour <u>COMPLIES</u> 1018.3 Corridor Width. At least 44" wide or as per 1005.1. 36" wide permitted within a dwelling unit in R-1, 30" in R-2, except as otherwise required by section 1107. 1018.4 Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length. 2. In occupancies in Groups B,E, F, I-1, M, R-1, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of dead-end corridors shall not exceed 50 feet (15 240 mm) 4. In occupancies in Group R-2, the dead end in a corridor shall not exceed 40 feet (12 192 mm). However, where the corridors are completely enclosed in construction having a 2-hour fire-resistance rating with all doors opening into the corridor being self-closing and having a fire-resistance rating of 1½ hours, the length of dead-end corridor shall not exceed 80 feet (24 384 mm). \*See Floor Plans For Calculations <u>COMPLIES</u> Number of Exits and Continuity: TABLE 1021.1MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD OCCUPANT LOAD MINIMUM NUMBER OF EXITS 501-1,000 More than 1,000 1021.2 Single exits. Only one exit shall be required in buildings or from stories of buildings as described below: 1.Stories in buildings as described in Table 1021.2. First story or basement: 49 occupants and 75 feet travel distance A, B\*, E\*, F\*, M, U, S\* 10 occupants and 75 feet travel distance \* Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet. INTERIOR ENVIRONMENT: 1206.4- Lighting in courts and yards. In Group I-1, R-1 or R-2 occupancies, all yards and courts shall be artificially illuminated with a minimum intensity of not less than 1 foot-candles measured 30 inches above the floor of the lowest level of such yards or courts. (Sheets A-022.00 & A-023.00) **NYC ENERGY CONSERVATION CODE NOTES:** The plans and specifications are in compliance with the New York City Energy Conservation Code, 2020 edition, by following ASHRAE 90.1-2016 compliance path as per Section C401.2. As per C408.1, Commissioning is required for the project because the total mechanical equipment capacity is above the threshold cited in Section C408.1. Prior to passing the final mechanical and plumbing inspections, an approved agency must conduct commissioning. GC shall provide evidence of mechanical systems commissioning and completion in accordance with the provisions of Section C408. GC has to provide copies of all documentation to the owner or owner's authorized agent and made available to the code official upon request in accordance with Sections C408.2.4 and C408.2.5. A commissioning plan shall be developed by an approved agency and shall include items under C408.2.1. As per C408.2.2, HVAC systems shall be balanced in accordance with ASHRAE 111. As per C408.2.3, functional performance testing for equipment and controls shall be conducted. As per C408.2.4, a preliminary report of commissioning test procedures and results shall be completed and certified by the approved agency and provided to the building owner or owner's authorized agent. GC to provide documents described in Sections C408.2.5.1 through C408.2.5.3 to the building owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy or letter of completion. The Final commissioning report to be provided to the building owner or owner's authorized agent in accordance with the requirements of Section C408.2.5.4. Controls for automatic lighting systems shall comply with Section C408.3. **ADDITIONAL DOB NOTES:** Ventilation for public halls and stairs provided per Multiple Dwelling Law 36. Smoke detectors to be provided in mechanical, electrical room and elevator machine rooms. Standby emergency power for all equipment listed in BC 2702.2.20.1 shall be provided. Refer to electrical drawings.

**Beach Channel Drive** □ 13-12 Beach Channel Drive, Far Rockaway, NY 11691 BRC & CPG 233 BROADWAY, SUITE 2150, NEW YORK, NY 10279 T: 212/979/1510 E: post@uai-ny.com www.uai-ny.con Consultants STRUCTURAL ENGINEER GACE Consulting Engineers 105 Madison Avenue, Floor 6, New York, NY MEP ENGINEER Skyline Engineering 42 West 39th Street, Floor 10, NY 10018 CIVIL ENGINEER Krypton Engineering 527 W 48th Street, Ground Floor, New York, NY LANDSCAPE ARCHITECT Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215 CODE CONSULTANT William Vitacco Associates Ltd. 299 Broadway, 5th Floor, New York, NY 10007 Plot Plan BLOCK 15528 /LOTS 5,6,& 9///// ZONING DISTRICT R6/ For Department of Buildings Use Issuance Schedule Description 1.1 | 06/14/21 | DOB PROGRESS SET 1.2 | 06/28/21 | ISSUED FOR FILING 1.3 | 08/24/21 | HPD BLDS SUBMISSION 08/13/21 | 50% CD 10/29/21 90% CD 3.1 11/08/21 HPD BLDS SUBMISSION 4 | 12/10/21 | 100% CD BUILDING CODE **ANALYSIS** Sign & Seal Drawing No. G-000.00 date drawn by job no. 12/10/21 20.15 DOB sheet sheet scale 1/16" = 1'-0"

DOB NUMBER

## **GENERAL NOTES**

- ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE RULES AND REGULATIONS OF LOCAL CODES AND ORDINANCES AND OTHER AUTHORITIES HAVING JURISDICTION. ALL REQUIRED PERMITS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.
- DRAWINGS ARE NOT TO BE SCALED. USE DIMENSIONS ONLY. CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE COMMENCING WORK.
- ALL DIMENSIONS ARE GIVEN FINISHED FACE TO FINISHED FACE, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PATCH AND REPAIR ALL HOLES WHICH OCCUR AS A RESULT OF DRILLING
- ALL EXITS SHALL BE KEPT READILY ACCESSIBLE AND UNOBSTRUCTED AT ALL TIMES.

AND/OR CUTTING IN EXISTING MASONRY WALLS TO MATCH EXISTING.

- ILLUMINATION OF AT LEAST 10 FOOT CANDLES MEASURED AT FLOOR LEVEL SHALL BE MAINTAINED CONTINUOUSLY DURING OCCUPANCY IN EXITS AND THEIR ACCESS FACILITIES
- EXIT LIGHTING SHALL BE ON CIRCUITS THAT ARE SEPARATE FROM ANY OTHER CIRCUITS, TAKE OFFS AHEAD OF MAIN SWITCH.
- LOCATION OF EVERY EXIT ON FLOOR SHALL BE CLEARLY INDICATED BY EXIT SIGNS. PLACE-IF REQUIRED- AT ANGLE WITH EXIT OPENING. INSTALL DIRECTIONAL SIGNS TO SERVE AS GUIDE FROM ALL PORTIONS OF THE CORRIDOR OPENING OF FLOOR.
- CORRIDORS AND EXIT PASSAGEWAYS SHALL HAVE A CLEAR HEIGHT OF 7'-6" FOR AT LEAST 75% OF THE FLOOR AREA WITH NO POINT LESS THAN 7'-0" IN HEIGHT. PROJECTION BELOW THE CEILING SHALL NOT OBSTRUCT FULL VIEW OF EXIT SIGNS.
- EXIT DOORS SHALL BE READILY OPEN-ABLE AT ALL TIMES FROM THE SIDE FROM WHICH EGRESS IS TO BE MADE. DOORS OPENING INTO INTERIOR-ENCLOSED STAIRS SHALL NOT BE
- EXHAUST SYSTEM DUCTS SHALL BE FIRE PROTECTED WITH CONSTRUCTION HAVING A FIRE RATING OF ONE OR TWO HOURS AS PER THE BUILDING CODE. REFER TO DETAILS.
- DUCTS, PIPES, AND CONDUITS PASSING THROUGH FIRE-RATED CONSTRUCTION SHALL HAVE SPACES NOT EXCEEDING 1/2" PACKED WITH MINERAL WOOL, OR CLOSED OFF WITH CLOSE FITTING METAL ESCUTCHEONS. AGGREGATE NET AREA OF SUCH OPENING SHALL NOT EXCEED 25 SQUARE INCHES IN ANY 100 SQUARE FOOT WALL OR FLOOR AREA UNLESS PROTECTED BY RATED SELF-CLOSING DEVICES.
- ENTIRE ALTERATION, INCLUDING INSULATION OF NEW PLUMBING PIPES AND VENT DUCTS, TO COMPLY WITH THE NEW YORK STATE ENERGY CODE.
- CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY AND ALL DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE TO NOTIFY THE ARCHITECT WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PERFORM THE WORK AS INTENDED BY THE
- CONTRACTOR TO OBTAIN FENCE PERMIT PRIOR TO THE START OF CONSTRUCTION AND TO INFORM ADJOINING NEIGHBORS BY LETTER AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION
- FLOOR TILES SHALL BE THIN SET CERAMIC, UNLESS OTHERWISE NOTED.
- CONTRACTOR ASSUMES RESPONSIBILITY FOR ALL CONCRETE TESTING UNLESS OTHERWISE NOTED IN THE DRAWINGS.

## SMOKE / CO DETECTORS

- ALL SMOKE AND CARBON MONOXIDE DETECTORS TO COMPLY WITH NEW YORK CITY LOCAL LAW 75/2011.
- EACH DWELLING UNIT SHALL BE EQUIPPED WITH AN APPROVED TYPE SMOKE DETECTION DEVICE AND A SEPARATE OR COMBINED CARBON MONOXIDE DEVICE RECEIVING ITS PRIMARY POWER FROM BUILDING WIRING WITH NO SWITCH IN CIRCUIT OTHER THAN THE OVERCIRCUIT PROTECTING THE BRANCH CIRCUIT AS PER APPLICABLE BUILDING CODES.
- SMOKE DETECTOR SHALL BE EITHER THE IONIZATION CHAMBER TYPE OR THE PHOTOELECTRIC TYPE AS PER APPLICABLE BUILDING CODES.
- ALL SMOKE & CO2 DETECTORS MUST BE INSTALLED WITHIN 15 FEET OF ENTRANCE OF ANY SLEEPING ROOM WALL OR CEILING MOUNTED AND INDICATED ON PLANS AS PER NYC BUILDING CODE, APPENDIX Q, FIRE CODE AND ELECTRICAL CODE.
- A CERTIFICATE OF SATISFACTORY INSTALLATION SHALL BE FILED WITH THE DIVISION OF CODE ENFORCEMENT 10 DAYS AFTER THE INSTALLATION IS COMPLETE.

## MASONRY NOTES

- EXTERIOR WALL SHALL BE BONDED WITH NON-CORROSIVE METAL TIES WHICH SHALL COMPLY WITH SECTION 8.4.1.1. METAL TIES TO BE TYPE APPROVED BY BOARD OF STANDARDS AND APPEALS.
- ALL CINDER CONCRETE BLOCKS SHALL COMPLY WITH TYPE APPROVED BY BOARD OF STANDARDS AND APPEALS.
- NO CONDUITS, PIPES, MEDICINE CABINETS, ETC., SHALL ENCROACH UPON ELEVATOR SHAFTS OR VENT SHAFTS.
- GENERAL MASONRY WORK IS DESIGNED IN ACCORDANCE WITH EMPIRICAL PROVISIONS OF BUILDING CODE AND IS NOT SUBJECT TO SPECIAL INSPECTION.
- MATERIALS SHALL BE SUBJECT TO ACCEPTANCE BY THE COMMISSIONER, NEW AND CLEARLY
- IDENTIFIED AS TO GRADE AND TRADEMARK. BUILDING BRICKS SHALL BE MADE FROM CLAY OR SHALE, ASTM C62-67. GRADE SW FOR EXTERIOR WALLS ABOVE GRADE, GRADE MW FOR INTERIOR.
  - CONCRETE BUILDING BRICK AS PER ASTM C55-56.
  - CONCRETE MASONRY UNITS TO BE GRADE N, TYPE I.
  - SOLID LOAD BEARING AS PER ASTM C145-66. HOLLOW LOAD BEARING BLOCK AS PER ASTM C90-66
  - HOLLOW NON-LOAD BEARING BLOCK AS PER ASTM C129-64 METAL ANCHORS AND TIES SHALL BE CORROSION-RESISTANT AS FOLLOWS:
  - SOLID LOAD BEARING AS PER ASTM C145-66.
- HOLLOW LOAF BEARING BLOCK AS PER ASTM C90-66. COPPER COATED WIRE TO BE GRADE 30 HS AS PER ASTM B227-65.
- MORTAR SHALL COMPLY WITH ASTM C270-64. TYPES S & N. PROPORTIONS AS OUTLINED IN SPECIFICATIONS.
- CEMENT SHALL BE TYPE 1 AS PER ASTM C150.
- LIME SHALL BE TYPE S AS PER ASTM C 207-49.
- SAND SHALL CONFORM TO ASTM C144-66.
- WATER SHALL BE CLEAN AND POTABLE. CONTRACTOR TO SUBMIT STATEMENT OF QUALITY OF MASONRY UNITS TO SHOW CONFORMANCE WITH UNITS DESIGNED.

## ACCESSIBILITY DIAGRAMS

REFER TO SHEETS G-200 THROUGH G-204, ANSI GENERAL NOTES FOR ACCESSIBILITY

### SPECIAL INSPECTIONS

| Y/N        | SPECIAL INSPECTIONS  | CODE/SECTION                   |
|------------|--|--------------------------------|
|            | Structural Steel – Welding   | BC 1704.3.1                    |
| <b>Yes</b> | Structural Steel – Details   | BC 1704.3.2                    |
|            | Structural Steel – High Strength Bolting   | BC 1704.3.3                    |
| No         | Structural Cold-Formed Steel   | BC 1704.3.4                    |
|            | Concrete – Cast-In-Place   | BC 1704.4                      |
|            | Concrete – Precast   | BC 1704.4                      |
| No         | Concrete – Prestressed   | BC 1704.4                      |
|            | Masonry  | BC 1704.5                      |
| No         | Wood – Installation of High-Load Diaphragms  | BC 1704.6.1                    |
| No         | Wood – Installation of Metal-Plate-Connected Trusses   | BC 1704.6.2                    |
| No         | Wood – Installation of Prefabricated I-Joists  | BC 1704.6.3                    |
|            | Subgrade Inspection  | BC 1704.7.1                    |
|            | Subsurface Conditions – Fill Placement & In-Place Density  | BC 1704.7.2/ BC 1704.7.3       |
|            | Subsurface Investigations (Borings/Test Pits)/ TR4   | BC 1704.7.4                    |
| No         | Deep Foundation Elements/ TR5  | BC 1704.8                      |
| No         | Helical Piles (BB # 2014-020)/ TR5H  | BC 1704.8.5                    |
| No         | Vertical Masonry Foundation Elements   | BC 1704.9                      |
|            | Wall Panels, Curtain Walls, and Veneers  | BC 1704.10                     |
|            | Sprayed fire-resistant materials  Mastin and Intumescent Fire resistant Continue                         | BC 1704.11                     |
|            | Mastic and Intumescent Fire-resistant Coatings  Exterior Insulation and Finish Systems (FIES)            | BC 1704.12                     |
|            | Exterior Insulation and Finish Systems (EIFS)  Alternative Materials                                     | BC 1704.13                     |
| No<br>No   |  | BC 1704.14<br>BC 1704.15       |
|            | Smoke Control Systems  Machanical Systems  |                                |
|            | Mechanical Systems  Fuel Oil Storage and Fuel Oil Bining Systems   | BC 1704.16<br>BC 1704.17       |
| No         | Fuel-Oil Storage and Fuel-Oil Piping Systems High-Pressure Steam Piping (Welding)                        | BC 1704.17<br>BC 1704.18       |
| No         | High Temperature Hot Water Piping (Welding)  | BC 1704.18                     |
| No         | High-Pressure Fuel-Gas Piping (Welding)  | BC 1704.19                     |
| No         | Structural Stability-Existing Buildings  | BC 1704.19                     |
|            | Excavations-Sheeting, Shoring, and Bracing   | BC 1704.20.2                   |
| No         | Underpinning   | BC 1704.20.3/ BC 1814          |
| No         | Mechanical Demolition  | BC 1704.20.4                   |
|            | Raising and Moving of a Building   | BC 1704.20.5                   |
| No         | Soil Percolation Test- Private On-Site Storm Water I Drainage Disposal Systems, and Detention Facilities | BC 1704.21.1.2                 |
| Yes        | Private On-Site Storm Water Drainage Disposal Systems, and Detention Facilities Installation             | BC 1704.21.2                   |
| No         | Individual On-Site Private Sewage Disposal Systems Installation  | BC 1704.22                     |
| No         | Soil Percolation Test - Individual On-Site Private Sewage Disposal Systems                               | BC 1704.22                     |
|            | Sprinkler Systems  | BC 1704.23                     |
|            | Standpipe Systems  | BC 1704.24                     |
|            | Heating Systems  | BC 1704.25                     |
| No         | Chimneys   | BC 1704.26                     |
|            | Fire-resistant Penetrations and Joints   | BC 1704.27                     |
|            | Aluminum Welding   | BC 1704.28                     |
| No         | Flood Zone Compliance  | BC 1704.29/ BC G105            |
|            | Luminous Egress Path Markings/ TR7   | BC 1704.30/ BC 1024.8          |
|            | Emergency and Standby Power Systems (Generators)   | BC 1704.31                     |
|            | Post-installed Anchors (BB# 2014-018, 2014-019)  | BC 1704.32                     |
| No         | Seismic Isolation Systems  | BC 1707.8                      |
|            | Concrete Design Mix/ TR3   | BC 1905.3/ BC 1913.5           |
|            | Concrete Sampling and Testing/ TR2   | BC 1905.6/ BC 1913.1 o         |
|            | Preliminary  Faction and Faundation  | 28-116.2.1, BC 110.2           |
|            | Footing and Foundation   | BC 110.3.1                     |
|            | Lowest Floor Elevation   | BC 110.3.2                     |
| No         | Structural Wood Frame  | BC 110.3.3                     |
|            | Energy Code Compliance Inspections   | BC 110.3.5                     |
|            | Fire-Resistance Rated Construction   | BC 110.3.4                     |
|            | Public Assembly Emergency Lighting   | 28-116.2.2                     |
|            | Final*   | 28-116.2.4.2, BC 110.5, Direct |

- ALL OTHER SPECIAL INSPECTIONS AS LISTED ON RELEVANT DRAWINGS SPECIAL INSPECTIONS ARE TO BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER OR A REGISTERED ARCHITECT, RETAINED BY THE OWNER AND ACCEPTABLE TO THE ARCHITECT OF RECORD. THE BUILDER OR CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND SCHEUDLING ALL INSPECTIONS. ALL INSPECTIONS TO BE MADE PRIOR TO PROCEEDING FURTHER WITH THE WORK. IF WORK OR MATERIALS SUBJECT TO SPECIAL INSPECTION ARE COVERED UP BEFORE THE SPECIAL INSPECTION OCCURS, SUCH WORK SHALL BE ENTIRELY UNCOVERED UNDER THE SUPERVISION OF THE ENGINEER, ARCHITECT OR HIS/HER REPRESENTATIVE. THE ARCHITECT OR ENGINEER SHALL SEE THAT ALL WORK UNDER THEIR INSPECTION COMPLIES WITH THE APPROVED PLANS.
- A LOG OR OTHER DOCUMENTATION SHALL BE MAINTAINED AT THE JOB SITE STATING WHEN ALL SPECIAL INSPECTIONS WERE PERFORMED, THE IDENTITY OF THE INSPECTOR, AND THE SCOPE OF
- THE WORK WHICH WAS PERFORMED. WHEN A "TR-1, 2, 3, OR 4" SPECIAL INSPECTION FORM IS FILED WITH THE BUILDING DEPARTMENT. SUCH FORM SHALL BE ACCOMPANIED BY A REPORT WHICH SHALL INCLUDE THE DATES OF INSPECTIONS. THE IDENTITY OF THE INSPECTOR, AND THE SCOPE OF THE WORK WHICH WAS
- OBSERVED. REPORTS SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW AND RECORD. WHEN A TRADE INSTALLING MECHANICAL WORK CAUSES STRUCTURAL MEMBERS OR RATED ASSEMBLIES TO LOSE THEIR INTEGRITY, REPAIRS SHALL BE PERFORMED UNDER THE
- SUPERVISION OF A DESIGNATED PERSON. BUILDING DEPARTMENT INSPECTORS SHALL REVIEW RECORDS AT JOB SITES TO MAKE CERTAIN THAT THERE IS ADEQUATE SELF-INSPECTION.

## **ENERGY CODE PROGRESS INSPECTIONS**

|     | <u> </u>  | <u> </u>   |
|-----|---|--|
| Y/N | PROGRESS INSPECTION                                 | TABLE REFERENCE IN<br>1RCNY 5000-01(h)(1) and (2 |
| Yes | Protection of exposed foundation insulation         | (IA1), (IIA1)                                    |
| Yes | Insulation placement and R values                   | (IA2),(11A2)                                     |
| Yes | Fenestration and door U-factor and product rating   | (IA3), (IIA3)                                    |
| Yes | Fenestration air leakage                            | (IA4),(11A4)                                     |
| Yes | Fenestration areas                                  | (IA5), (IIA5)                                    |
| Yes | Air sealing and insulation - visual                 | (IA6), (IIA6)                                    |
| No  | Air sealing and insulation - testing                | (IA7), (IIA7)                                    |
| Yes | Air barrier - continuity plan testing / inspection  | (IIA8)   |
| Yes | Vestibules  | (IIA9)   |
| No  | Fireplaces  | (IB1), (IIB1)                                    |
| Yes | Shutoff dampers                                     | (IB2), (IIB2)                                    |
| Yes | HVAC and service water heating equipment            | (IB3), (IIB3)                                    |
| Yes | HVAC and service water heating system controls      | (IB4), (IIB4)                                    |
| Yes | HVAC and service water piping design and insulation | (IB5), (IIB5)                                    |
| No  | Duct leakage testing                                | (IB6), (IIB6)                                    |
| No  | Electrical energy consumption                       | (IC1), (IIC1)                                    |
| Yes | Lighting in dwelling units                          | (IIC2)   |
| Yes | Interior lighting power                             | (IC2), (IIC3)                                    |
| Yes | Exterior lighting power                             | (IIC4)   |
| Yes | Lighting controls                                   | (IIC5)   |
| No  | Electrical motors                                   | (IIC6)   |
| Yes | Maintenance information                             | (ID1), (IID1)                                    |
| No  | Permanent certificate                               | (ID2)  |
| No  | Solar Ready Requirements                            | (ID3)  |

### NYS ENERGY NOTES

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE LATEST EDITION OF THE ENERGY CONSERVATION CONSTRUCTION CODE OF THE STATE OF NEW YORK. SEE ENERGY CALCULATION SHEETS.

## MULTIPLE DWELLING LAW

- BUILDING SHALL CONFORM TO ARTICLE 7 MULTIPLE DWELLING LAW AND DEPARTMENT RULES AND REGULATIONS AND HOUSING MAINTENANCE CODE
- EXTERIOR LIGHT OR LIGHTS SHALL BE OF AT LEAST 50 WATTS SHALL BE LOCATED AT A HEIGHT OF BETWEEN 8'-0" AND 10'-0" ABOVE GROUND LEVEL AND SHALL BE LOCATED SO AS TO ADEQUATELY LIGHT ALL PORTIONS OF REAR YARD AS PER SECTION 26 MULTIPLE DWELLING LAW AND SECTION 27-2040 HOUSING MAINTENANCE CODE.
- OWNER SHALL PROVIDE LIGHTING OF AT LEAST 50 WATTS FOR EVERY VESTIBULE, ENTRANCE HALL, PUBLIC HALL STAIR, AND PUBLIC HALL. LIGHTS SHALL BE SO LOCATED THAT EVERY PART THEREOF SHALL BE LIGHTED AS PER SECTION 37.1 MULTIPLE DWELLING LAW.
- OWNER SHALL PROVIDE LIGHTS FROM SUNSET TO SUNRISE OF THE FOLLOWING DAY AS PER SECTION 37.2 MULTIPLE DWELLING LAW.
- OWNER SHALL PROVIDE APPROVED-TYPE GOVERNMENT MAILBOXES AS APPROVED BY THE POST OFFICE AS PER SECTION 57 MULTIPLE DWELLING LAW AND 27-2041 HOUSING MAINTENANCE CODE
- OWNER SHALL INSTALL INTERCOM SYSTEM, FOR EACH APARTMENT, IN VESTIBULE OF BUILDING AS PER SECTION 57 MULTIPLE DWELLING LAW.
- CELLAR CEILINGS SHALL BE FIRE-RETARDED WITH 5/8" FIRECODE 60 AS PER SECTION 185 MULTIPLE
- PARAPETS AND GUARDRAILS TO BE 3'-6" HIGH AS PER SECTION 62 MULTIPLE DWELLING LAW.
- AS PER SECTION 64.2 MULTIPLE DWELLING LAW NO GAS METER SHALL BE PLACED IN A BOILER ROOM, STAIR OR PUBLIC HALL.
- ALL LIQUID OR WATER-BORNE WASTE FROM PLUMBING FIXTURES SHALL BE CONVEYED BY A HOUSE DRAIN AND HOUSE SEWER TO A STREET SEWER AS PER SECTION 77.1 MULTIPLE DWELLING
- THE OWNER OF EVERY MULTIPLE DWELLING OR PART THERE OF SHALL THOROUGHLY CLEANSE AND KEEP CLEAN AT ALL TIMES, AND IN GOOD REPAIR, THE ENTIRE PLUMBING AND DRAINAGE SYSTEM AS PER SECTION 77.4 MULTIPLE DWELLING LAW.
- A REAR YARD SHALL BE PROVIDED, 13'-0" OR MORE IN DEPTH ACROSS THE ENTIRE LOT AS PER SECTION 22 MULTIPLE DWELLING LAW.
- SKYLIGHT OVER PUBLIC HALL ON TOP STORY SHALL HAVE AT LEAST 20 SQUARE FEET GLAZED AREA (PLAIN GLASS) MINIMUM 40 SQUARE INCH RIDGE VENT WITH SUITABLE WIRE SCREENS ABOVE AND BELOW AS PER SECTION 178 MULTIPLE DWELLING LAW.
- ROOF SCUTTLES SHALL BE AT LEAST 22" IN WIDTH AND 26" IN LENGTH COVERED ON THE EXTERIOR WITH METAL AND PROVIDED WITH A STATIONARY METAL LADDER AS PER SECTION 188 MULTIPLE
- STAIRS LEADING FROM A CELLAR TO THE FLOOR ABOVE SHALL BE CONSTRUCTED OF INCOMBUSTIBLE MATERIALS AS PER SECTION 190 MULTIPLE DWELLING LAW.
- REMOVE ALL WAINSCOTING ON ANY PUBLIC HALL OR STAIR AS PER SECTION 191 MULTIPLE
- A CELLAR ENTRANCE FROM OUTSIDE THE DWELLING SHALL BE PROVIDED WITH A METAL FIRE
- LADDER OR A FIRE PROOF STAIR LEADING TO AN EXTERIOR OPENING 2'-6" IN WIDTH AND 6'-0" IN HEIGHT AS PER SECTION 192 MULTIPLE DWELLING LAW.
- CEILING OF KITCHENETTES AND BATHROOMS SHALL BE FURRED DOWN AS REQUIRED; KITCHENETTE ARCH TO BE FURRED DOWN TO A MINIMUM OF 1'-0" FROM CEILING.
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF AND SHALL BE SUBJECT TO THE APPROVAL OF THE DEPARTMENT OF WATER SUPPLY, GAS, AND ELECTRICITY OR CON EDISON.
- GAS RANGES SHALL BE OF TYPE APPROVED BY AMERICAN GAS ASSOCIATION AND **UNDERWRITERS' LABORATORIES**
- OWNER SHALL PROVIDE AND MAINTAIN A PEEPHOLE IN THE ENTRANCE DOOR OF EACH DWELLING UNIT: SUCH PEEPHOLE SHALL BE LOCATED AND CONFORM IN ALL RESPECTS TO THE REQUIREMENTS OF SECTION 27-2041 HOUSING MAINTENANCE CODE.
- THE CEILINGS AND WALLS OF ALL KITCHENETTES AND PUBLIC HALLS SHALL BE FIRE-RETARDED WITH 5/8" NATIONAL GOLD BOND "FIRE-SHIELD" (NYC BSA CAL.NO. 439-52-SM) OR APPROVED EQUAL.
- OWNER SHALL INSTALL AND MAINTAIN LIGHTS ON EXTERIOR OF BUILDING; WHICH LIGHTS SHALL BE PROTECTED BY A METAL GUARD OR SHATTERPROOF GLOBE; LIGHTS SHALL BE OF AT LEAST 50 WATTS ILLUMINATION AND BE PLACED ON EACH SIDE OF FRONT ENTRANCE AT A HEIGHT OF BETWEEN 8'-0" AND 10'-0" ABOVE FLOOR LEVEL ADJACENT TO THE ENTRANCEWAY AS PER SECTION 26 MULTIPLE DWELLING LAW AND SECTION 27-2040HOUSING MAINTENANCE CODE.
- ALL WINDOW SIZES SHOWN ARE BETWEEN STOP BEADS.ALL ENTRANCE AND VESTIBULE DOORS TO CONTAIN NOT LESS THAN 5 SQUARE FEET OF GLAZED AREA.
- OWNER SHALL PROVIDE A KEY LOCK, DEAD BOLT LOCK AND CHAIN GUARD ON EACH DWELLING UNIT DOOR AS PER SECTION 27-2043 HOUSING MAINTENANCE CODE.
- ALL APARTMENT ENTRANCE DOORS AND DOORS TO PUBLIC HALL STAIRS TO BE ONE-HOUR APPROVED, FIREPROOF, SELF-CLOSING INCLUDING DOOR ASSEMBLY.
- OWNER SHALL REGISTER BUILDING AT HOUSING DIVISION AS PER SECTION 27-2097 HOUSING
- OWNER SHALL PROVIDE A SIGN IN VESTIBULE IDENTIFYING OWNER, MANAGER, AND SUPERINTENDENT AS PER SECTION 27-2104 HOUSING MAINTENANCE CODE.
- 29. ALL LIVING ROOMS WILL HAVE A MINIMUM CEILING HEIGHT OF 8'-0" AND A MINIMUM ROOM SIZE OF 132 SQUARE FEET FOR BUILDING ERECTED AFTER APRIL 18. 1929, AS PER SECTION 27-2074 HOUSING MAINTENANCE CODE.
- THE MAXIMUM NUMBER OF PERSONS FOR ANY APARTMENT SHALL BE THE TOTAL LIVABLE FLOOR AREA DIVIDED BY 80 SQUARE FEET AS PER SECTION 27-2075 HOUSING MAINTENANCE CODE.
- NO NEW ROOMING UNITS SHALL BE CREATED AS PER SECTION 27-2077 HOUSING MAINTENANCE
- OWNER SHALL FILE FIRE REGISTRATION STATEMENT WITH HOUSING DIVISION AS PER SECTION 27-2098 HOUSING MAINTENANCE CODE.
- REGISTRATION SHALL CONTAIN THE FOLLOWING INFORMATION: BLOCK AND LOT, STREET NUMBER, NAME OF OWNER INCLUDING HOME AND OFFICE ADDRESS, NAME AND ADDRESS OF MANAGING AGENT, TELEPHONE NUMBER OF OWNER, AND PAY REQUIRED FEE AS PER SECTION 27-2098 HOUSING MAINTENANCE CODE.
- CHANGE OF OWNERSHIP OF A BUILDING REQUIRES CHANGE OF REGISTRATION STATEMENT AS PER SECTION 27-2099 HOUSING MAINTENANCE CODE.
- CHANGE OF MANAGING AGENT SHALL REQUIRE FILING AS PER SECTION 27-2101 HOUSING MAINTENANCE CODE.
- ASHES OR WASTE MATTER SHALL NOT BE ALLOWED TO ACCUMULATE OTHER THAN IN PROPER RECEPTACLES: A SUFFICIENT NUMBER OF RECEPTACLES SHALL BE PROVIDED FOR WASTE DISPOSAL AS PER SECTION 27-2021 HOUSING MAINTENANCE CODE.
- EVERY MULTIPLE DWELLING SHALL BE PROVIDED WITH HEAT FROM A CENTRAL HEATING SYSTEM AS PER SECTION 27-2028 HOUSING MAINTENANCE CODE.
- A MINIMUM TEMPERATURE SHALL BE SUPPLIED FROM A CENTRAL HEATING SYSTEM. SUCH SYSTEM SHALL KEEP THE INSIDE TEMPERATURE AT 68 WHEN THE OUTSIDE TEMPERATURE FALLS BELOW 55 DURING THE HOURS OF 6:00 A.M. AND 10:00 P.M., AND AT AN INSIDE TEMPERATURE OF 55 WHEN THE OUTSIDE TEMPERATURE FALLS BELOW 40 BETWEEN THE HOURS OF 10:00 P.M. AND 6:00 A.M., ALL DURING THE MONTHS OF OCTOBER 1 THROUGH MAY 31 AS PER SECTION 27-2029HOUSING MAINTENANCE CODE.
- THE OWNER SHALL HAVE THE CENTRAL HEATING SYSTEM INSPECTED BY A QUALIFIED PERSON AS PER SECTION 27-2030 HOUSING MAINTENANCE CODE.
- FLOOR SIGNS DESIGNATING FLOORS SHALL BE PROVIDED WITHIN STAIR ENCLOSURES AND IN PUBLIC HALLS NEAR THE STAIRS AS PER SECTION 27-2048 HOUSING MAINTENANCE CODE.
- OWNER SHALL PROVIDE A STREET NUMBER ON THE FRONT OF THE BUILDING VISIBLE FROM THE

SIDEWALK AS PER SECTION 27-2049 HOUSING MAINTENANCE CODE.

## ABBREVIATIONS

CY

DEM

DET

DN

DS

EP

EQ

DIAM

cubic yard

detail

down

egual

expansion join

**SYMBOLS** 

EXIST existing

diameter

dimension

demolish, demolition

| <del>/</del> BB | <u>REVIATIOI</u>                        | <u> </u> |                                       |          |                                 |
|-----------------|---|----------|---------------------------------------|----------|---------------------------------|
| AFF             | above finished floor                    | FB       | face brick                            | ОС       | on center (s)                   |
| ACT             | acoustical tile                         | FOC      | face of concrete                      | OPG      | opening                         |
| ADJ             | adjacent                                | FOF      | faxe of finish                        | OPP      | opposite                        |
| A/C             | air conditioning                        | FOM      | face of masonry                       | OD       | outside diameter                |
| ALT             | alternate                               | FOS      | face of studs                         | OITC     | outdoor indoor                  |
| AL              | aluminum                                | FF       | finish face                           | 0110     | transmission class              |
| AS              | aluminum saddle                         | FIN      | finish (ed)                           |          | a anomicolori ciaco             |
| ANOD            | anodized                                | FFE      | finished floor elevation              | PTD      | paint (ed)                      |
| APX             | approximate                             | FFL      | finished floor line                   | PNL      | panel                           |
| ARCH            |   | FE       | fire extinguisher                     | PVMT     | pavement                        |
| AD              | area drain                              | FPSC     | fire proof self-closing               | PLAM     | plastic laminate                |
| ASPH            | asphalt                                 | FL       | floor                                 | PL       | plate                           |
|                 | •                                       | FD       | floor drain                           | PWD      | plywood                         |
| BIT             | bituminous                              | FTG      | footing                               | PT       | point                           |
| BLK             | block                                   | FND      | foundation                            | PSF      | pounds per square foot          |
| BLKG            | blocking                                | FBO      | furnished by others                   | PSI      | pounds per square inch          |
| BOT             | bottom                                  |          | ·                                     | PC       | precast concrete                |
| BOS             | bottom of steel                         | GA       | gage, gauge                           | PL       | property line                   |
| BRK             | brick                                   | GALV     | galvanized                            |          |                                 |
| BLDG            | building                                | GC       | general contract (or)                 | RAD      | radius                          |
| BL              | building line                           | GL       | glass, glazing                        | REG      | register                        |
|                 |   | GT       | glazed tile                           | RE       | reinforce (d), (ing)            |
| CAB             | cabinet                                 | GB       | grab bar                              | REQ      | required                        |
| CPT             | carpet                                  | GD       | grade, grading                        | RES      | resistant                       |
| CIPC            | cast-in-place concrete                  | GWB      | gypsum wall board                     | RET      | retum                           |
| CST             | cast stone                              |          |                                       | REV      | revision (s), revised           |
| CB              | catch basin                             | HDW      | hardware                              | RH       | right hand                      |
| CK              | caulk (ing)                             | HDR      | header                                | R        | riser                           |
| CLG             | ceiling                                 | HVAC     | heating/ ventilation/                 | RD       | roof drain                      |
| CH              | ceiling height                          |          | air conditioning                      | RM       | room                            |
| CEM             | cement                                  | HT       | height                                | RO       | rough opening                   |
| CT              | ceramic tile                            | HP       | high point                            | 0011     |                                 |
| CLR             | clear (ance)                            | H/C      | handicapped                           | SCH      | schedule                        |
| COL             | column                                  | HM       | hollow metal                          | SEC      | section                         |
| CONC            |   | HB       | hose bibb                             | SHT      | sheet                           |
| CMU             | concrete masonry unit<br>Γ construction | HWH      | hot water heater                      | SIM<br>S | similar                         |
|                 |   | INCL     | include (d) (ing)                     | SPEC     | south                           |
| CUNTE           | R contract (or)                         | INCL     | include (d), (ing)<br>inside diameter | SQ       | specification (s) square        |
| CPG             | control joint                           | INT      | interior                              | SFRM     | sprayed fire-resistive material |
| CORR            | coping<br>corridor                      | INV      | invert                                | SST      | stainless steel                 |
| CFL             | counterflashing                         | II N V   | IIIV GIL                              | STD      | standard                        |
| CRS             | course (s)                              | JC       | janitor's closet                      | ST       | steel                           |
| 0110            | course (s)                              | 30       | jamioi a dioact                       | 0.70     | Sieei                           |

KIT kitchen (ette) KO knockout linen closet manhole

north

NTS not to scale

not in contract

NIC

SMOKE DETECTOR

**EXIT LIGHT & SIGN** 

GRADE ELEVATION

PARTITION TYPE

DOOR TYPE

WINDOW TYPE

DETAIL NO.

SHEET NO.

**BUILDING ELEVATION** 

WALL ELEVATION / SECTION

CARBON MONOXIDE DETECTOR

SMOKE/CARBON DETECTOR

downspout MFR manufacture drain marble saddle DWG drawing MS MAS masonry drinking fountian masonry opening east MTI metal ELEC electric (al) MAX maximum electrical panelboard MECH mechanic (al) elevation MIN minimum ELEV elevator MISC miscellaneous EMER emergency MT mount (ed), (ing)

VCT vinyl composition tile VB vinyl base VIF verify in field WSCT wainscot WC water closet WP waterproofing WR water resistan NRC noise reduction weather strip (ing) coefficient WWF welded wire fabric NOM nominal W west

STC sound transmission

UON unless otherwise noted

class

TEL telephone

TYP typical

VERT vertical

W/ with

WD

W/O without

wood

THK thick (ness) TOP top of parapet

# **Beach Channel Drive**

13-12 Beach Channel Drive, Far Rockaway, NY 11691

**BRC & CPG** 



Consultants STRUCTURAL ENGINEER

LANDSCAPE ARCHITECT

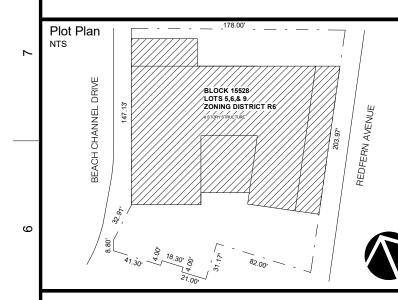
**GACE Consulting Engineers** 105 Madison Avenue, Floor 6, New York, NY MEP ENGINEER

Skyline Engineering 42 West 39th Street, Floor 10, NY 10018 CIVIL ENGINEER

Krypton Engineering 527 W 48th Street, Ground Floor, New York, NY

Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215

CODE CONSULTANT William Vitacco Associates Ltd 299 Broadway, 5th Floor, New York, NY 10007



For Department of Buildings Use

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**GENERAL NOTES** 

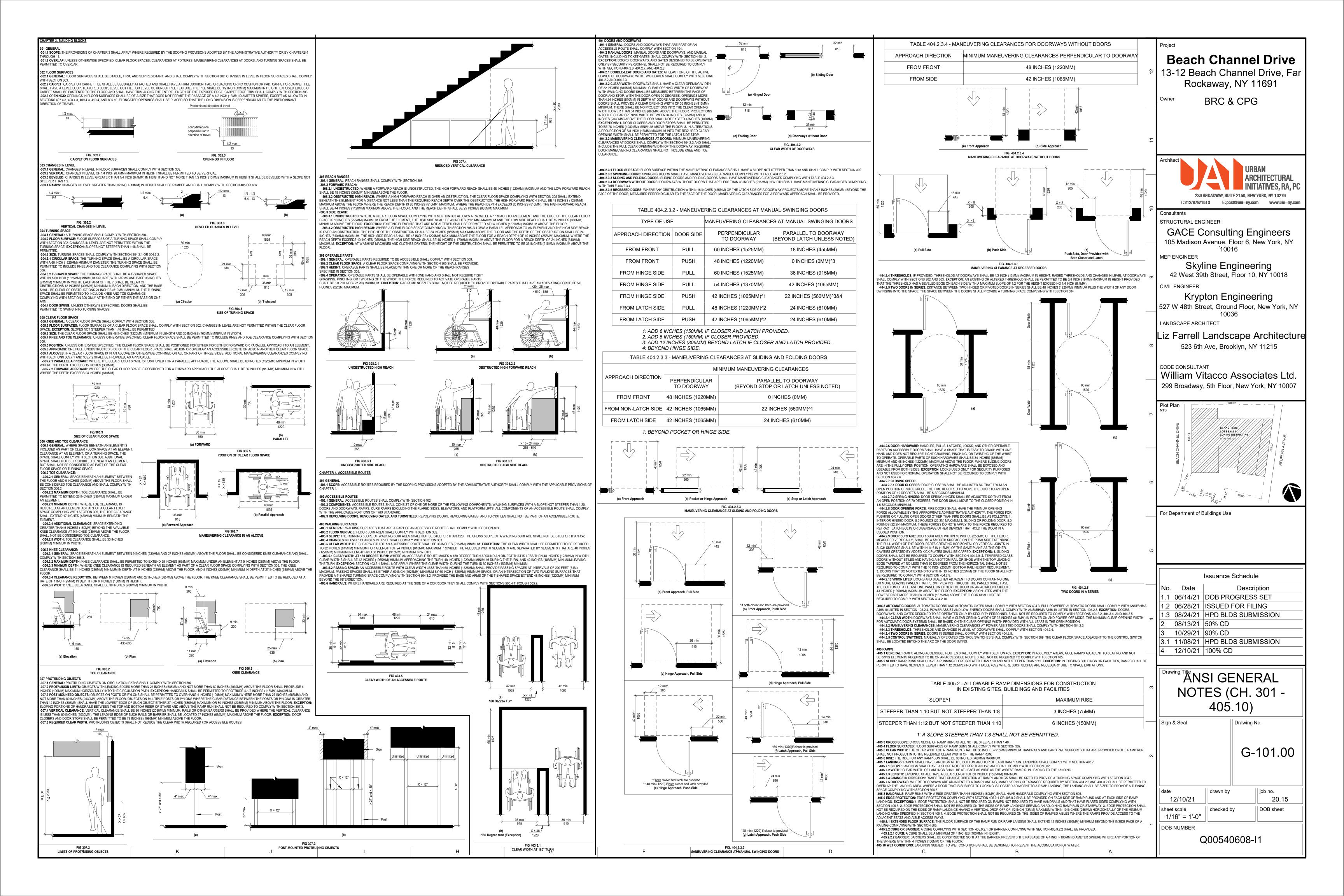
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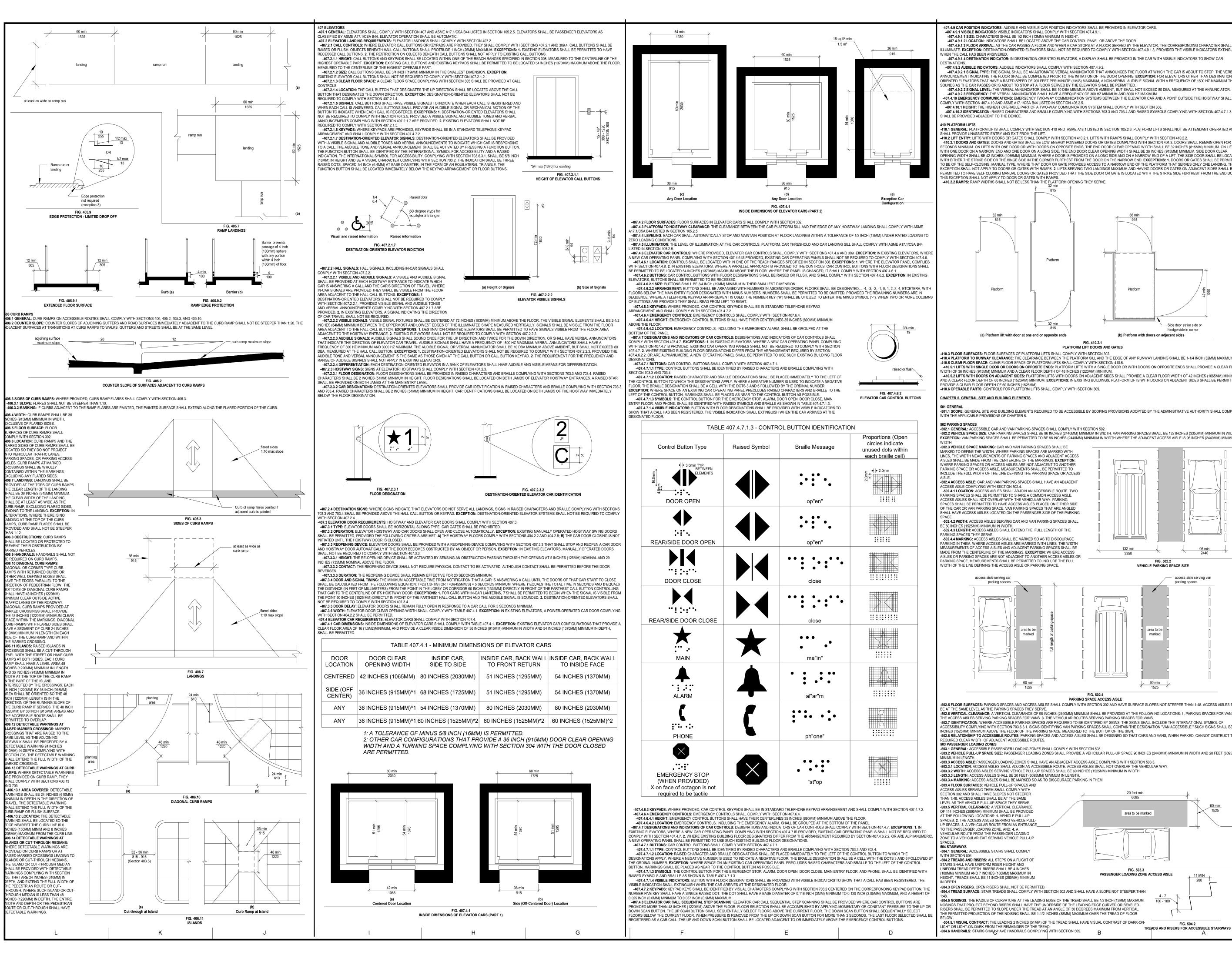
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G-100.00

Drawing No.

drawn by job no. 12/10/21 20.15 DOB sheet sheet scale checked by 1/16" = 1'-0"





407.4.9 CAR POSITION INDICATORS: AUDIBLE AND VISIBLE CAR POSITION INDICATORS SHALL BE PROVIDED IN ELEVATOR CARS. -407.4.9.1 VISIBLE INDICATORS: VISIBLE INDICATORS SHALL COMPLY WITH SECTION 407.4.9.1

-407.4.9.1.1 SIZE: CHARACTERS SHALL BE 1/2 INCH (13MM) MINIMUM IN HEIGHT.

-407.4.9.1.2 LOCATION: INDICATORS SHALL BE LOCATED ABOVE THE CAR CONTROL PANEL OR ABOVE THE DOOR -407.4.9.1.3 FLOOR ARRIVAL: AS THE CAR PASSES A FLOOR AND WHEN A CAR STOPS AT A FLOOR SERVED BY THE ELEVATOR, THE CORRESPONDING CHARACTER SHALL LUMINATE. EXCEPTION: DESTINATION-ORIENTED ELEVATORS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 407.4.9.1.3, PROVIDED THE VISIBLE INDICATORS EXTINGUISI -407.4.9.1.4 DESTINATION INDICATOR: IN DESTINATION-ORIENTED ELEVATORS, A DISPLAY SHALL BE PROVIDED IN THE CAR WITH VISIBLE INDICATORS TO SHOW CAR

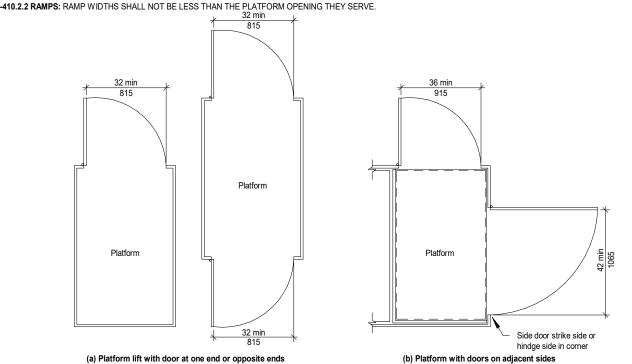
-407.4.9.2 AUDIBLE INDICATORS: AUDIBLE INDICATORS SHALL COMPLY WITH SECTION 407.4.9.2. -407.4.9.2.1 SIGNAL TYPE: THE SIGNAL SHALL BE AN AUTOMATIC VERBAL ANNUNCIATOR THAT ANNOUNCES THE FLOOR AT WHICH THE CAR IS ABOUT TO STOP. THE VERBAL INDUNCEMENT INDICATING THE FLOOR SHALL BE COMPLETED PRIOR TO THE INITIATION OF THE DOOR OPENING. EXCEPTION: FOR ELEVATORS OTHER THAN DESTINATION-ENTED ELEVATORS THAT HAVE A RATED SPEED OF 200 FEET PER MINUTE (1M/S) MAXIMUM, A NON-VERBAL AUDIBLE SIGNAL WITH A FREQUENCY OF 1500 HZ MAXIMUM THAT UNDS AS THE CAR PASSES OR IS ABOUT TO STOP AT A FLOOR SERVED BY THE ELEVATOR SHALL BE PERMITTED. -407.4.9.2.2 SIGNAL LEVEL: THE VERBAL ANNUNCIATOR SHALL BE 10 DBA MINIMUM ABOVE AMBIENT, BUT SHALL NOT EXCEED 80 DBA, MEASURED AT THE ANNUNCIATOR.
-407.4.9.2.3 FREQUENCY: THE VERBAL ANNUNCIATOR SHALL HAVE A FREQUENCY OF 300 HZ MINIMUM AND 3000 HZ MAXIMUM.

-407.4.10.1 HEIGHT: THE HIGHEST OPERABLE PART OF A TWO-WAY COMMUNICATION SYSTEM SHALL COMPLY WITH SECTION 308. -407.4.10.2 IDENTIFICATION: RAISED CHARACTERS AND BRAILLE COMPLYING WITH SECTIONS 703.3 AND 703.4 AND RAISED SYMBOLS COMPLYING WITH SECTION 407.4.7.1.3 ALL BE PROVIDED ADJACENT TO THE DEVICE.

410.1 GENERAL: PLATFORM LIFTS SHALL COMPLY WITH SECTION 410 AND ASME A18.1 LISTED IN SECTION 105.2.6. PLATFORM LIFTS SHALL NOT BE ATTENDANT OPERATED AND

SHALL PROVIDE UNASSISTED ENTRY AND EXIT FROM THE LIFT.

410.2 LIFT ENTRY: LIFTS WITH DOORS OR GATES SHALL COMPLY WITH SECTION 410.2.1. LIFTS WITH RAMPS SHALL COMPLY WITH SECTION 410.2.2. 410.2.1 DOORS AND GATES: DOORS AND GATES SHALL BE LOW ENERGY POWERED DOORS OR GATES COMPLYING WITH SECTION 404.3. DOORS SHALL REMAIN OPEN FOR 20 ONDS MINIMI MONULETS WITH ONE DOOR OR WITH DOORS ON OPPOSITE FNDS. THE FND DOOR CLEAR OPENING WIDTH SHALL RE 32 INCHES (815MM) MINIMI IM ON LIETS H ONE DOOR ON A NARROW END AND ONE DOOR ON A LONG SIDE, THE END DOOR CLEAR OPENING WIDTH SHALL BE 36 INCHES (915MM) MINIMUM. SIDE DOOR CLEAR ENING WIDTH SHALL BE 42 INCHES (1065MM) MINIMUM. WHERE A DOOR IS PROVIDED ON A LONG SIDE AND ON A NARROW END OF A LIFT. THE SIDE DOOR SHALL BE LOCATED EITHER THE STRIKE SIDE OR THE HINGE SIDE IN THE CORNER FURTHEST FROM THE DOOR ON THE NARROW END. EXCEPTIONS: 1. DOORS OR GATES SHALL BE PERMITTED O BE OF THE SELF-CLOSING, MANUAL TYPE, WHERE THAT DOOR OR GATE PROVIDES ACCESS TO A NARROW END OF THE PLATFORM THAT SERVES ONLY ONE LANDING. THIS EXCEPTION SHALL NOT APPLY TO DOORS OR GATES WITH RAMPS. 2. LIFTS SERVING TWO LANDINGS MAXIMUM AND HAVING DOORS OR GATES ON ADJACENT SIDES SHALL BE PERMITTED TO HAVE SELF CLOSING MANUAL DOORS OR GATES PROVIDED THAT THE SIDE DOOR OR GATE IS LOCATED WITH THE STRIKE SIDE FURTHEST FROM THE END DOOR. THIS EXCEPTION SHALL NOT APPLY TO DOOR OR GATES WITH RAMPS.



PLATFORM LIFT DOORS AND GATES 10.3 FLOOR SURFACES: FLOOR SURFACES OF PLATFORM LIFTS SHALL COMPLY WITH SECTION 302 10.4 PLATFORM TO RUNWAY CLEARANCE: THE CLEARANCE BETWEEN THE PLATFORM SILL AND THE EDGE OF ANY RUNWAY LANDING SHALL BE 1-1/4 INCH (32MM) MAXIMUM. 410.5 CLEAR FLOOR SPACE: CLEAR FLOOR SPACE OF PLATFORM LIFTS SHALL COMPLY WITH SECTION 410.5. 410.5.1 LIFTS WITH SINGLE DOOR OR DOORS ON OPPOSITE ENDS: PLATFORM LIFTS WITH A SINGLE DOOR OR WITH DOORS ON OPPOSITE ENDS SHALL PROVIDE A CLEAR FLOOR /IDTH OF 36 INCHES (915MM) MINIMUM AND A CLEAR FLOOR DEPTH OF 48 INCHES (1220MM) MINIMUM. 410.5.2 LIFTS WITH DOORS ON ADJACENT SIDES: PLATFORM LIFTS WITH DOORS ON ADJACENT SIDES SHALL PROVIDE A CLEAR FLOOR WIDTH OF 42 INCHES (1065MM) MINIMUM

FIG. 410.2.1

ND A CLEAR FLOOR DEPTH OF 60 INCHES (1525MM) MINIMUM. EXCEPTIONS: IN EXISTING BUILDINGS, PLATFORM LIFTS WITH DOORS ON ADJACENT SIDES SHALL BE PERMITTED TO PROVIDE A CLEAR FLOOR DEPTH OF 60 INCHES (1525MM). 410.6 OPERABLE PARTS: CONTROLS FOR PLATFORM LIFTS SHALL COMPLY WITH SECTION 309.

501.1 SCOPE: GENERAL SITE AND BUILDING ELEMENTS REQUIRED TO BE ACCESSIBLE BY SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL COMPLY

-502.1 GENERAL: ACCESSIBLE CAR AND VAN PARKING SPACES SHALL COMPLY WITH SECTION 502.
-502.2 VEHICLE SPACE SIZE: CAR PARKING SPACES SHALL BE 96 INCHES (2440MM) MINIMUM IN WIDTH. VAN PARKING SPACES SHALL BE 132 INCHES (3350MM) MINIMUM IN WIDTH. XCEPTION: VAN PARKING SPACES SHALL BE PERMITTED TO BE 96 INCHÉS (2440MM) MINIMUM IN WIDTH WHERE THE ADJACENT ACCESS AISLE IS 96 INCHES (2440MM) MINIMUM IN

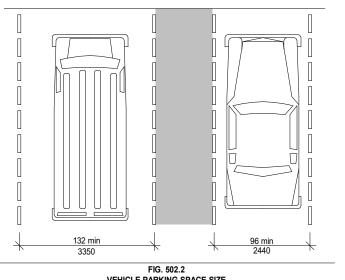
MARKED TO DEFINE THE WIDTH. WHERE PARKING SPACES ARE MARKED WITH LINES, THE WIDTH MEASUREMENTS OF PARKING SPACES AND ADJACENT ACCESS AISLES SHALL BE MADE FROM THE CENTERLINE OF THE MARKINGS. **EXCEPTION**: WHERE PARKING SPACES OR ACCESS AISLES ARE NOT ADJACENT TO ANOTHER PARKING SPACE OR ACCESS AISLE, MEASUREMENTS SHALL BE PERMITTED TO INCLUDE THE FULL WIDTH OF THE LINE DEFINING THE PARKING SPACE OR ACCESS 502.4 ACCESS AISLE: CAR AND VAN PARKING SPACES SHALL HAVE AN ADJACENT ACCESS AISLE COMPLYING WITH SECTION 502.4.

-502.4.1 LOCATION: ACCESS AISLES SHALL ADJOIN AN ACCESSIBLE ROUTE. TWO ARKING SPACES SHALL BE PERMITTED TO SHARE A COMMON ACCESS AISLE. ACCESS AISLES SHALL NOT OVERLAP WITH THE VEHICULAR WAY. PARKING ICES SHALL BE PERMITTED TO HAVE ACCESS AISLES PLACED ON EITHER SID OF THE CAR OR VAN PARKING SPACE, VAN PARKING SPACES THAT ARE ANGLE HALL HAVE ACCESS AISLES LOCATED ON THE PASSENGER SIDE OF THE PARKING

-502.4.2 WIDTH: ACCESS AISLES SERVING CAR AND VAN PARKING SPACES SHALL BE 60 INCHES (1525MM) MINIMUM IN WIDTH. -502.4.3 LENGTH: ACCESS AISLES SHALL EXTEND THE FULL LENGTH OF THE ARKING SPACES THEY SERVE. -502.4.4 MARKING: ACCESS AISLES SHALL BE MARKED SO AS TO DISCOURAGE

ARKING IN THEM, WHERE ACCESS AISLES ARE MARKED WITH LINES, THE WIDTH EASUREMENTS OF ACCESS AISLES AND ADJACENT PARKING SPACES SHALL BE MADE FROM THE CENTER! INF OF THE MARKINGS EXCEPTION: WHERE ACCESS AISLES OR PARKING SPACES ARE NOT ADJACENT TO ANOTHER ACCESS AISLES OR ARKING SPACE, MEASUREMENTS SHALL BE PERMITTED TO INCLUDE THE FULL

area to be



VEHICLE PARKING SPACE SIZE access aisle serving van area to be

60 min 1525

502.5 FLOOR SURFACES: PARKING SPACES AND ACCESS AISLES SHALL COMPLY WITH SECTION 302 AND HAVE SURFACE SLOPES NOT STEEPER THAN 1:48. ACCESS AISLES SHALL -502.6 VERTICAL CLEARANCE: A VERTICAL CLEARANCE OF 98 INCHES (2490MM) MINIMUM SHALL BE PROVIDED AT THE FOLLOWING LOCATIONS: 1, PARKING SPACES FOR VANS. 2.

IE ACCESS AISLES SERVING PARKING SPACES FOR VANS. 3. THE VEHICULAR ROUTES SERVING PARKING SPACES FOR VANS. -502.7 IDENTIFICATION: WHERE ACCESSIBLE PARKING SPACES ARE REQUIRED TO BE IDENTIFIED BY SIGNS. THE SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF CCESSIBILITY COMPLYING WITH SECTION 703.6.3.1. SIGNS IDENTIFYING VAN PARKING SPACES SHALL CONTAIN THE DESIGNATION "VAN ACCESSIBLE." SUCH SIGNS SHALL BE 60 NCHES (1525MM) MINIMUM ABOVE THE FLOOR OF THE PARKING SPACE. MEASURED TO THE BOTTOM OF THE SIGN. 502.8 RÈLATIONSHIP TO ACCESSIBLE ROUTES: PARKING SPACES AND ACCESS AISLES SHALL BE DESIGNED SO THAT CARS AND VANS, WHEN PARKED, CANNOT OBSTRUCT THE REQUIRED CLEAR WIDTH OF ADJACENT ACCESSIBLE ROUTES. 103.1 GENERAL: ACCESSIBLE PASSENGER LOADING ZONES SHALL COMPLY WITH SECTION 503

FIG. 502.4

PARKING SPACE ACCESS AISLE

-503.2 VEHICLE PULL-UP SPACE SIZE: PASSENGER LOADING ZONES SHALL PROVIDE A VEHICULAR PULL-UP SPACE 96 INCHES (2440MM) MINIMUM IN WIDTH AND 20 FEET (6095MM) -503.3 ACCESS AISLE:PASSENGER LOADING ZONES SHALL HAVE AN ADJACENT ACCESS AISLE COMPLYING WITH SECTION 503.3. **03.3.1 LOCATION**: ACCESS AISLES SHALL ADJOIN AN ACCESSIBLE ROUTE. ACCESS AISLES SHALL NOT OVERLAP THE VEHICULAR WAY.

-503.3.2 WIDTH: ACCESS AISLES SERVING VEHICLE PULL-UP SPACES SHALL BE 60 INCHES (1525MM) MINIMUM IN WIDTH. 03.3.3 LENGTH: ACCESS AISLES SHALL BE 20 FEET (6095MM) MINIMUM IN LENGTH 503.3.4 MARKING: ACCESS AISLES SHALL BE MARKED SO AS TO DISCOURAGE PARKING IN THEM -503.4 FLOOR SURFACES: VEHICLE PULL-UP SPACES AND

area to be marked

504.1 GENERAL: ACCESSIBLE STAIRS SHALL COMPLY -504.2 TREADS AND RISERS: ALL STEPS ON A FLIGHT OF STAIRS SHALL HAVE UNIFORM RISER HEIGHT AND INIFORM TREAD DEPTH, RISERS SHALL BE 4 INCHES 00MM) MINIMUM AND 7 INCHES (180MM) MAXIMUM II PASSENGER LOADING ZONE ACCESS AISLE EIGHT. TREADS SHALL BE 11 INCHES (280MM) MINIMUM

-504.3 OPEN RISERS. OPEN RISERS SHALL NOT BE PERMITTED. **104.4 TREAD SURFACE:** STAIR TREADS SHALL COMPLY WITH SECTION 302 AND SHALL HAVE A SLOPE NOT STEEPER THAN -504.5 NOSINGS: THE RADIUS OF CURVATURE AT THE LEADING EDGE OF THE TREAD SHALL BE 1/2 INCH (13MM) MAXIMUM. NOSINGS THAT PROJECT BEYOND RISERS SHALL HAVE THE UNDERSIDE OF THE LEADING EDGE CURVED OR BEVELED RISERS SHALL BE PERMITTED TO SLOPE UNDER THE TREAD AT AN ANGLE OF 30 DEGREES MAXIMUM FROM VERTIC

THE PERMITTED PROJECTION OF THE NOISING SHALL BE 1-1/2 INCHES (38MM) MAXIMUM OVER THE TREAD OF FLOOR -504.5.1 VISUAL CONTRACT: THE LEADING 2 INCHES (51MM) OF THE TREAD SHALL HAVE VISUAL CONTRAST OF DARK-ON-LIGHT OR LIGHT-ON-DARK FROM THE REMAINDER OF THE TREAD.

-904.6 HANDRAILS: STAIRS SHALE HAVE HANDRAILS COMPLYING WITH SECTION 505. TREADS AND RISERS FOR ACCESSIBLE STAIRWAYS

**Beach Channel Drive** 13-12 Beach Channel Drive, Far

Rockaway, NY 11691

**BRC & CPG** 



Consultants STRUCTURAL ENGINEER

**GACE Consulting Engineers** 105 Madison Avenue, Floor 6, New York, NY

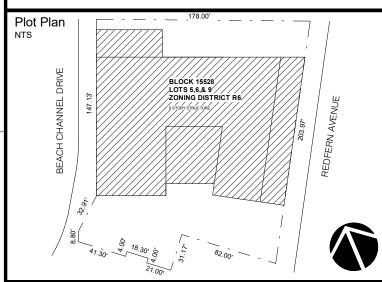
MEP ENGINEER Skyline Engineering 42 West 39th Street, Floor 10, NY 10018 CIVIL ENGINEER

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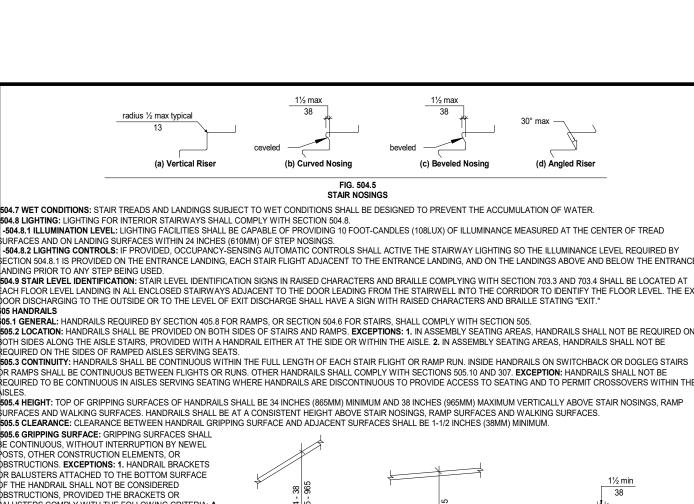


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**ANSI GENERAL** NOTES (CH. 406.1 -504.6)

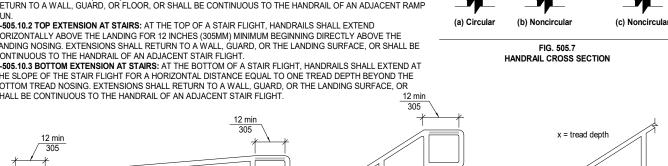
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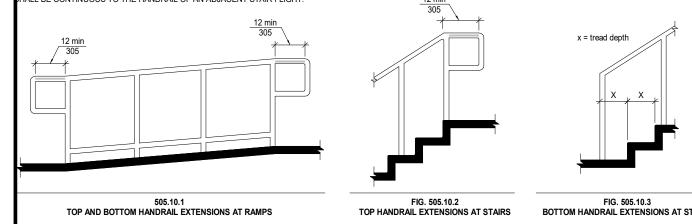


URFACES AND WALKING SURFACES. HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE STAIR NOSINGS, RAMP SURFACES AND WALKING SURFACES. **105.5 CLEARANCE:** CLEARANCE BETWEEN HANDRAIL GRIPPING SURFACE AND ADJACENT SURFACES SHALL BE 1-1/2 INCHES (38MM) MINIMUM. 5.6 GRIPPING SURFACE: GRIPPING SURFACES SHALL CONTINUOUS, WITHOUT INTERRUPTION BY NEWEL STS, OTHER CONSTRUCTION ELEMENTS, OR TRUCTIONS. EXCEPTIONS: 1. HANDRAIL BRACKETS BALUSTERS ATTACHED TO THE BOTTOM SURFACE F THE HANDRAIL SHALL NOT BE CONSIDERED TRUCTIONS, PROVIDED THE BRACKETS OR LISTERS COMPLY WITH THE FOLLOWING CRITERIA: A. OT MORE THAN 20 PERCENT OF THE HANDRAIL LENGTH OBSTRUCTED B. HORIZONTAL PROJECTIONS BEYOND IE SIDES OF THE HANDRAIL OCCUR 1-1/2 INCHES MM) MINIMUM BELOW THE BOTTOM OF THE NDRAIL, AND PROVIDED THAT FOR EACH 1/2 INCH BMM) OF ADDITIONAL HANDRAIL PERIMETER MENSION ABOVE 4 INCHES (100MM), THE VERTICAL RANCE DIMENSION OF 1-1/2 INCH (38MM) CAN BE DUCED BY 1/8 INCH (3.2MM), AND, C. EDGES SHALL BE UNDED. **2.** WHERE HANDRAILS ARE PROVIDED ALONG ALKING SURFACES WITH SLOPES NOT STEEPER THAN 20, THE BOTTOMS OF HANDRAIL GRIPPING SURFACES HANDRAIL HEIGHT HANDRAIL CLEARANCE IALL BE PERMITTED TO BE OBSTRUCTED ALONG R ENTIRE LENGTH WHERE THEY ARE INTEGRAL TO

7 CROSS SECTION: HANDRAILS SHALL HAVE A CROSS SECTION COMPLYING WITH SECTION 505.7.1 OR 505.7.2 5.7.1 CIRCULAR CROSS SECTION: HANDRAILS WITH CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF 1-1/4 INCHES (32MM) MINIMUM AND 2 INCHES (51MM) 105.7.2 NONCIRCULAR CROSS SECTIONS: HANDRAILS WITH A NONCIRCULAR CROSS SECTION SHALL HAVE A PERIMETER DIMENSION OF 4 INCHES (100MM) MINIMUM AND 6-1/4 INCHE 160MM) MAXIMUM, AND A CROSS-SECTION DIMENSION OF 2-1/4 INCHES (57MM) MAXIMUM. 505.8 SURFACES: HANDRAILS, AND ANY WALL OR OTHER SURFACES ADJACENT TO THEM, SHALL BE FREE OF

NY SHARP OR ABRASIVE ELEMENTS. EDGES SHALL BE ROUNDED. 105.9 FITTINGS: HANDRAILS SHALL NOT ROTATE WITHIN THEIR FITTINGS. 05.10 HANDRAIL EXTENSIONS: HANDRAILS SHALL EXTEND BEYOND AND IN THE SAME DIRECTION OF STAIR GHTS AND RAMP RUNS IN ACCORDANCE WITH SECTION 505.10. EXCEPTIONS: 1. CONTINUOUS HANDRAILS AT INSIDE TURN OF STAIRS AND RAMPS. 2. HANDRAIL EXTENSIONS ARE NOT REQUIRED IN AISLES SERVING ATING WHERE THE HANDRAILS ARE DISCONTINUOUS TO PROVIDE ACCESS TO SEATING AND TO PERMIT SOVERS WITHIN THE AISLE. 3. IN ALTERATIONS, FULL EXTENSIONS OF HANDRAILS SHALL NOT BE REQUIRED HERE SUCH EXTENSIONS WOULD BE HAZARDOUS DUE TO PLAN CONFIGURATION. -505.10.1 TOP AND BOTTOM EXTENSION AT RAMPS: RAMP HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE E LANDING 12 INCHES (305MM) MINIMUM BEYOND THE TOP AND BOTTOM OF RAMP RUNS. EXTENSIONS SHALL TURN TO A WALL, GUARD, OR FLOOR, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT RAMP -505.10.2 TOP EXTENSION AT STAIRS: AT THE TOP OF A STAIR FLIGHT, HANDRAILS SHALL EXTEND





06.1 GENERAL: ACCESSIBLE WINDOWS SHALL HAVE OPERABLE PARTS COMPLYING WITH SECTION 309.

## APTER 6. PLUMBING ELEMENTS AND FACILITIES

ASH RAILS OR BUMPER GUARDS.

11.1 SCOPE: PLUMBING ELEMENTS AND FACILITIES REQUIRED TO BE ACCESSIBLE BY SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL COMPLY WITH IE APPLICABLE PROVISIONS OF CHAPTER 6.

2 DRINKING FOUNTAINS **102.1 GENERAL:** ACCESSIBLE DRINKING FOUNTAINS SHALL COMPLY WITH SECTIONS 602 AND 307. 102.2 CLEAR FLOOR SPACE: A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR A FORWARD APPROACH TO THE DRINKING FOUNTAIN, SHALL BE PROVIDED.

NEE AND TOE SPACE COMPLYING WITH SECTION 306 SHALL BE PROVIDED. THE CLEAR FLOOR PACE SHALL BE CENTERED ON THE DRINKING FOUNTAIN. EXCEPTIONS: 1. DRINKING **EXCEPTIONS: 1.** TOE CLEARANCE AT THE FRONT ITAINS FOR STANDING PERSONS. 2. DRINKING FOUNTAINS PRIMARILY FOR CHILDREN'S USE SHALL BE PERMITTED WHERE THE SPOUT OUTLET IS 30 INCHES (760MM) MAXIMU

OVE THE FLOOR. A PARALLEL APPROACH COMPLYING WITH SECTION 305 IS PROVIDED AND THE CLEAR FLOOR SPACE IS CENTERED ON THE DRINKING FOUNTAIN. 02.3 OPERABLE PARTS: OPERABLE PARTS SHALL 602.4 SPOUT OUTLET HEIGHT: SPOUT OUTLETS WHEELCHAIR ACCESSIBLE DRINKING OUNTAINS SHALL BE 36 INCHES (915MM AXIMUM ABOVE THE FLOOR. SPOUT OUTLETS OF NKING FOUNTAINS FOR STANDING PERSONS HALL BE 38 INCHES (965MM) MINIMUM AND 43 S (1090MM) MAXIMUM ÁBOVE THE ELOOF 02.5 SPOUT LOCATIONS: THE SPOUT SHALL BE CATED 3-1/2 INCHES (90MM) MAXIMUM FROM IE FRONT EDGE OF THE DRINKING FOUNTAIN 02.6 WATER FLOW: THE SPOUT SHALL PROVIDE GHT. THE ANGLE OF THE WATER STREAM RONT OF THE DRINKING FOUNTAIN SHALL BE 30. REES MAXIMUM, AND FROM SPOUTS TWEEN 3 INCHES (75MM) AND 5 INCHES (125MM) HALL BE 15 DEGREES MAXIMUM, MEASURED PARALLEL APPROACH AT DRINKING FOUNTAINS DRINKING FOUNTAIN SPOUT LOCATION PRIMARILY FOR CHILDREN'S USE - (EXCEPTION 2) IE DRINKING FOUNTAIN

3 TOILET AND BATHING ROOMS 03.1 GENERAL: ACCESSIBLE TOILET AND BATHING ROOMS SHALL COMPLY WITH SECTION 603.

-603.2.1 TURNING SPACE: A TURNING SPACE COMPLYING WITH SECTION 304 SHALL BE PROVIDED WITHIN THE ROOM. THE REQUIRED TURNING SPACE SHALL NOT BE PROVIDED -603.2.2. DOOR SWING: DOORS SHALL NOT SWING INTO THE CLEAR FLOOR SPACE OR CLEARANCE FOR ANY FIXTURE. EXCEPTIONS: 1. DOORS TO A TOILET OR BATHING ROOM FOR OVIDED THE SWING OF THE DOOR CAN BE REVERSED TO COMPLY WITH SECTION 603.2.2. 2. WHERE THE ROOM IS FOR INDIVIDUAL USE AND A CLEAR FLOOR SPACE COMPLYING H SECTION 305.3 IS PROVIDED WITHIN THE ROOM BEYOND THE ARC OF THE DOOR SWING, THE DOOR SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 603.2.2 33.3 MIRRORS: WHERE MIRRORS ARE LOCATED ABOVE LAVATORIES. A MIRROR SHALL BE LOCATED OVER THE ACCESSIBLE LAVATORY AND SHALL BE MOLINTED WITH THE ROTTOL GE OF THE REFLECTING SURFACE 40 INCHES (1015MM) MAXIMUM ABOVE THE FLOOR. WHERE MIRRORS ARE LOCATED ABOVE COUNTERS THAT DO NOT CONTAIN LAVATORIES, EMIRROR SHALL BE MOUNTED WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE 40 INCHES (1015MM) MAXIMUM ABOVE THE FLOOR. EXCEPTION: OTHER THAN WITHIN CESSIBLE DWELLING OR SLEEPING UNITS, MIRRORS ARE NOT REQUIRED OVER LAVATORIES OR COUNTERS IF A MIRROR IS LOCATED WITHIN THE SAME TOILET OR BATHING OM AND MOUNTED WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE 35 INCHES (890MM) MAXIMUM ABOVE THE FLOOR. 103.4 COAT HOOKS AND SHELVES: COAT HOOKS SHALL BE LOCATED WITHIN ONE OF THE REACH RANGES SPECIFIED IN SECTION 308. SHELVES SHALL BE 40 INCHES (1015MM) NIMUM AND 48 INCHES (1220MM) MAXIMUM ABOVE THE FLOOR 3.5 DIAPER CHANGING TABLES: DIAPER CHANGING TABLES SHALL COMPLY WITH SECTIONS 309 AND 902.

3.6 OPERABLE PARTS: OPERABLE PARTS ON TOWEL DISPENSERS AND HAND DRYERS SERVING ACCESSIBLE LAVATORIES SHALL COMPLY WITH TABLE 603.6.

|  | TABLE 603.6 MAXIMUM REACH DEPTH AND HEIGHT |                    |                     |                     |                     |                      |  |  |  |  |  |
|--|--|--------------------|---------------------|---------------------|---------------------|----------------------|--|--|--|--|--|
| MAXIMUM<br>REACH DEPTH   | 0.5 inch<br>(13mm)                         | 2 inches<br>(51mm) | 5 inches<br>(125mm) | 6 inches<br>(150mm) | 9 inches<br>(230mm) | 11 inches<br>(280mm) |  |  |  |  |  |
| MAXIMUM  | 48 inches                                  | 46 inches          | 42 inches           | 40 inches           | 36 inches           | 34 inches            |  |  |  |  |  |
| REACH HEIGHT (1220mm) (1170mm) (1065mm) (1015mm) (915mm) (865mm) |  |                    |                     |                     |                     |                      |  |  |  |  |  |

04.1 GENERAL: ACCESSIBLE WATER CLOSETS AND TOILET COMPARTMENTS SHALL COMPLY WITH SECTION 604. COMPARTMENTS CONTAINING MORE THAN ONE PLUMBING FIXTUR HALL COMPLY WITH SECTION 603. WHEELCHAIR ACCESSIBLE COMPARTMENTS SHALL COMPLY WITH SECTION 604.9. AMBULATORY ACCESSIBLE COMPARTMENTS SHALL COMPLY ITH SECTION 604.10. EXCEPTION: WATER CLOSETS AND TOILET COMPARTMENTS PRIMARILY FOR CHILDREN'S USE SHALL BE PERMITTED TO COMPLY WITH SECTION 604.11 AS 64.2 LOCATION: THE WATER CLOSET SHALL BE LOCATED WITH A WALL OR PARTITION TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 16 ICHES (405MM) MINIMUM TO 18 INCHES (455MM) MAXIMUM FROM THE SIDE WALL OR PARTITION. WATER CLOSETS LOCATED IN AMBULATORY ACCESSIBLE COMPARTMENTS PECIFIED IN SECTION 604.10 SHALL HAVE THE CENTERLINE OF THE WATER CLOSET 17 INCHES (430MM) MINIMUM TO 19 INCHES (485MM) MAXIMUM FROM THE SIDE WALL OR

04.3 CLEARANCE -604.3.1 CLEARANCE WIDTH: A EARANCE AROUND A WATER WIDTH, MEASURED PERPENDICULAR -604.3.2 CLEARANCE DEPTH ARANCE AROUND THE WATE OSET SHALL BE 56 INCHES (1420MM RPENDICULAR FROM THE REAR -604.3.3 CLEARANCE OVERLAP:TH ATER CLOSET SHALL BE PERMITTE OVERLAP THE WATER CLOSET SOCIATED GRAB BARS, PAPER

CEPTACLES, COAT HOOKS

ELVES, ACCESSIBLE ROUTES, CLEAR

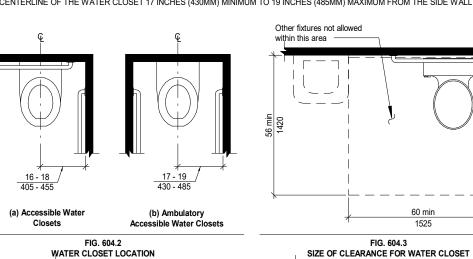
OOR SPACE AT OTHER FIXTURES

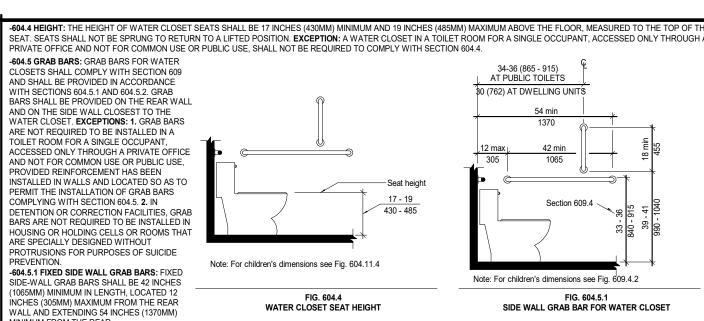
ID THE TURNING SPACE. NO OTHER

TURES OR OBSTRUCTIONS SHALL

E WITHIN THE REQUIRED WATER

SET CLEARANCE.





WALL. IN ADDITION, A VERTICAL GRAB BAR 18 INCHES (455MM) MINIMUM IN LENGTH SHALL BE MOUNTED WITH THE BOTTOM OF THE BAR LOCATED 39 INCHES (990MM) MINIMUM ANI 41 INCHES (1040MM) MAXIMUM ABOVE THE FLOOR, AND WITH THE CENTER LINE OF THE BAR LOCATED 39 INCHES (990MM) MINIMUM AND 41 INCHES (1040MM) 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 REAL WALL GRAB BAR SHALL BE 36 INCHES (915MM) MINIMUM IN LENGTH, AND EXTEND FROM THE CENTERLINE OF THE WATER CLOSET 1 INCHES (305MM) MINIMUM ON THE SIDE CLOSEST TO THE WALL, AND 24 INCHES (610MM) MINIMUM ON THE TRANSFER SIDE. EXCEPTIONS: 1. THE REAR GRAB BAR SHALL BE PERMITTED TO BE 24 INCHES (610MM) MINIMUM IN LENGTH, CENTERED ON THE WATER CLOSET, WHERE WALL SPACE DOES NOT PERMIT A GRAB BAR 36 INCHES (915MM) 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 LUSH 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

THE OPEN SIDE OF THE TOILET AREA. -604.6 FLUSH CONTROLS: FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTION 309. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET. **EXCEPTION**: IN AMBULATORY ACCESSIBLE COMPARTMENTS COMPLYING WITH SECTION 604.10, FLUSH CONTROLS SHALL BE PERMITTED TO BE LOCATED ON EITHER SIDE OF THE WATER CLOSET.

-604.7 DISPENSERS: TOILET PAPER DISPENSERS SHALL COMPLY WITH SECTION 309.4. WHERE THE DISPENSER IS LOCATED ABOVE THE GRAB BAR, THE OUTLET OF THE DISPENSER SHALL BE LOCATED WITHIN AN AREA 24 INCHES
(610MM) MINIMUM AND 36 INCHES (915MM) MAXIMUM FROM THE REAR WALL. WHERE THE DISPENSER IS LOCATED BELOW THE GRAB BAR, THE OUTLET OF THE DISPENSER SHALL BE LOCATED WITHIN AN AREA 24 INCHES (610MM) MINIMUM AND 42 INCHES (1065MM) MAXIMUM FROM THE REAR WALL. THE OUTLET OF THE DISPENSER SHALL BE LOCATED WITHIN AN AREA 24 INCHES (610MM) MINIMUM AND 455MM) MINIMUM AND 48 INCHES (1220MM) MAXIMUM ABOVE THE FLOOR. DISPENSERS SHALL COMPLY WITH SECTION 109.3. DISPENSERS SHALL NOT BE OF A TYPE THAT CONTROL DELIVERY, OR DO NOT ALLOW CONTINUOUS PAPER FLOW. 604.8 COAT HOOKS: COAT HOOKS PROVIDED WITHIN TOILET COMPARTMENTS SHALL BE 48 INCHES (1220MM) MAXIMUM ABOVE THE FLOOR, SHELVES SHALL BE 40 INCHES (1015MM) MINIMUM AND 48 INCHES (1220MM) MAXIMUM ABOVE THE -604.9 WHEELCHAIR ACCESSIBLE COMPARTMENTS: 04.9.1 GENERAL: WHEELCHAIR ACCESSIBLE COMPARTMENTS SHALL COMPLY WITH SECTION 604.9. -604.9.2 SIZE: TOILET COMPARTMENTS SHALL COMPLY WITH SECTION 604.9.2.1 OR 604.9.2.2 AS APPLICABLE 604.9.2.1 MINIMUM AREA: THE MINIMUM AREA OF A WHEELCHAIR ACCESSIBLE COMPARTMENT SHALL BE 60 INCHES 25MM) MINIMUM IN WIDTH MEASURED PERPENDICULAR TO THE SIDE WALL. AND 56 INCHES (1420MM) MINIMUM IN

CLUSIVE OF PARTITION SUPPORT MEMBERS

RTITION IS NOT REQUIRED IN A COMPARTMENT

GREATER THAN 60 INCHES (1575MM) IN DEPTH WITH

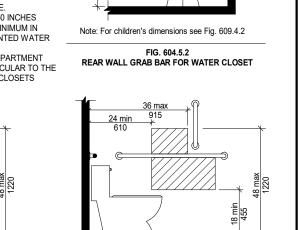
WALL-HUNG WATER CLOSET, OR GREATER THAN

MOUNTED WATER CLOSET. 2. TOE CLEARANCE AT

35 INCHES (1650MM) IN DEPTH WITH FLOOR-

THE SIDE PARTITION IS NOT REQUIRED IN A

ITH FOR WALL HUNG WATER CLOSETS, AND 59 INCHES (1500MM) MINIMUM IN DEPTH FOR FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL. 604.9.2.2 COMPARTMENT FOR CHILDREN'S USE: THE MINIMUM AREA OF A WHEELCHAIR ACCESSIBLE COMPARTMENT PRIMARILY FOR CHILDREN'S USE SHALL BE 60 INCHES (1525MM) MINIMUM IN WIDTH MEASURED PERPENDICULAR TO THE SIDE WALL, AND 59 INCHES (1500MM) MINIMUM IN DEPTH FOR WALL HUNG AND FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL



(b) Floor-Mounted Water Closet - Adult

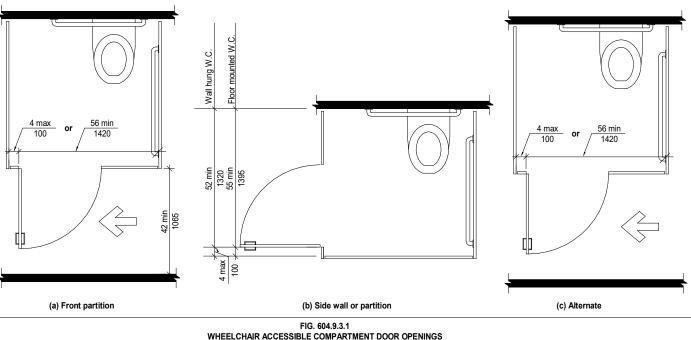
Wall-Hung and Floor-Mounted Water Closet - Children

WHEELCHAIR ACCESSIBLE TOILET COMPARTMENTS

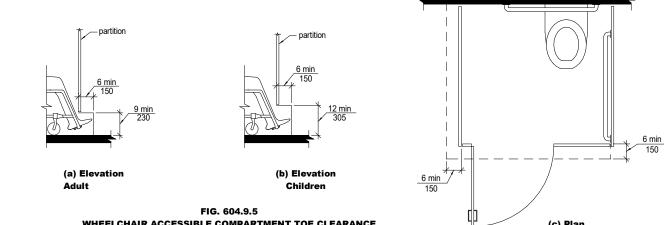
(a) Protruding Dispenser Below Grab Bar (b) Protruding Dispenser Above Grab Bar (c) Recessed Dispenser DISPENSER OUTLET LOCATION 604.9.3 DOORS: TOILET COMPARTMENT DOORS, ICLUDING DOOR HARDWARE, SHALL COMPLY WITH CTION 404, EXCEPT IF THE APPROACH IS TO THE TCH SIDE OF THE COMPARTMENT DOOR EARANCE BETWEEN THE DOOR SIDE OF THE TALL AND ANY OBSTRUCTION SHALL BE 42 INCHES 065MM) MINIMUM. THE DOOR SHALL BE SELF-OSING. A DOOR PULL COMPLYING WITH SECTION 04.2.6 SHALL BE PLACED ON BOTH SIDES OF THE OOR NEAR THE LATCH, TOILET COMPARTMENT OORS SHALL NOT SWING INTO THE REQUIRED JINIMUM AREA OF THE COMPARTMENT -604.9.3.1 DOOR OPENING LOCATION: THE RTHEST EDGE OF TOILET COMPARTMENT DOOR ENING SHALL BE LOCATED IN THE FRONT WALL OR ARTITION OR IN THE SIDE WALL OR PARTITION AS -604.9.4 APPROACH: WHEELCHAIR ACCESSIBLE MPARTMENTS SHALL BE ARRANGED FOR LEF AND OR RIGHT-HAND APPROACH TO THE WATER -604.9.5 TOE CLEARANCE: TOE CLEARANCE FOR OMPARTMENTS PRIMARILY FOR CHILDREN'S USE SHALL COMPLY WITH SECTION 604 9.5.2 TOF ARANCE FOR OTHER WHEELCHAIR ACCESSIBLE -604.9.5.1 TOE CLEARANCE AT COMPARTMENTS: HE FRONT PARTITION AND AT LEAST ONE SIDE ARTITION SHALL PROVIDE A TOF CLEARANCE OF 9. NCHES (230MM) MINIMUM ABOVE THE FLOOR AND TENDING 6 INCHES (150MM) BEYOND THE DMPARTMENT SIDE FACE OF THE PARTITION

(a) Wall-Hung Water Closet - Adult

| ARTMENT GREATER THAN 66 INCHES (1675MM)<br>TH. |  |                    |
|--|--|--------------------|
| TA   | ABLE 604.9.3.1 - DOOR OPENING LOCATION               |                    |
| DOOR OPENING LOCATION                          | MEASURED FROM  | DIMENSION          |
|  | FROM THE SIDE WALL OR PARTITION CLOSEST TO THE WATER | 56 INCHES (1420MM) |
| FRONT WALL OR PARTITION                        | CLOSET OR  |                    |
| THORT WILL ON THINK                            | FROM THE SIDE WALL OR PARTITION FARTHEST TO THE      | 4 INCHES (100MM)   |
| SIDE WALL OR PARTITION                         | WATER CLOSET<br>FROM THE REAR WALL                   | 52 INCHES (1320MM) |
| WALL-HUNG WATER CLOSET                         | OR   |                    |
| WALL-HONG WATER CLOSET                         | FROM THE FRONT WALL OR PARTITION                     | 4 INCHES (100MM)   |
| SIDE WALL OR PARTITION                         | FROM THE REAR WALL                                   | 55 INCHES (1395MM) |
| FLOOR-MOUNTED WATER                            | OR   |                    |
| CLOSET   | FROM THE FRONT WALL OR PARTITION                     | 4 INCHES (100MM)   |



-604.9.5.2 TOE CLEARANCE AT COMPARTMENTS FOR CHILDREN'S USE: THE FRONT PARTITION AND AT LEAST ONE SIDE PARTITION OF COMPARTMENTS PRIMARILY FOR ILDREN'S USE SHALL PROVIDE A TOE CLEARANCE OF 12 INCHES (305MM) MINIMUM ABOVE THE FLOOR AND EXTENDING 6 INCHES (150MM) BEYOND THE COMPARTMENT SIDE CE OF THE PARTITION, EXCLUSIVE OF PARTITION SUPPORT MEMBERS. EXCEPTIONS: 1. TOE CLEARANCE AT THE FRONT IS NOT REQUIRED IN A COMPARTMENT GREATER THA 55 INCHES (1650MM) IN DEPTH. 2. TOE CLEARANCE AT THE SIDE PARTITION IS NOT REQUIRED IN A COMPARTMENT GREATER THAN 66 INCHES (1675MM) IN WIDTH. 604.9.6 GRAB BARS: GRAB BARS SHALL COMPLY WITH SECTION 609. SIDE WALL GRAB BARS COMPLYING WITH SECTION 604.5.1 LOCATED ON THE WALL CLOSEST TO THE ATER CLOSET, AND A REAR WALL GRAB BAR COMPLYING WITH SECTION 604.5.2, SHALL BE PROVIDED.



## WHEELCHAIR ACCESSIBLE COMPARTMENT TOE CLEARANCE

04.10 AMBULATORY ACCESSIBLE COMPARTMENTS 604.10.1 GENERAL: AMBULATORY ACCESSIBLE COMPARTMENTS SHALL COMPLY WITH SECTION 604.10. 604.10.2 SIZE: THE MINIMUM AREA OF AN AMBULATORY ACCESSIBLE COMPARTMENT SHALL BE 60 INCHES 325MM) MINIMUM IN DEPTH AND 36 INCHES (915MM) IN WIDTH. 604.10.3 DOORS: TOILET COMPARTMENT DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH ECTION 404. EXCEPT IF THE APPROACH IS TO THE LATCH SIDE OF THE COMPARTMENT DOOR THE EARANCE BETWEEN THE DOOR SIDE OF THE COMPARTMENT AND ANY OBSTRUCTION SHALL BE 42 INCHES 065MM) MINIMUM. THE DOOR SHALL BE SELF-CLOSING. A DOOR PULL COMPLYING WITH SECTION 404.2.6 LL BE PLACED ON BOTH SIDES OF THE DOOR NEAR THE LATCH. COMPARTMENT DOORS SHALL NOT SWING TO THE REQUIRED MINIMUM AREA OF THE COMPARTMENT. **604.10.4 GRAB BARS:** GRAB BARS SHALL COMPLY WITH SECTION 609. SIDE WALL GRAB BARS COMPLYING ITH SECTION 604.5.1 SHALL BE PROVIDED ON BOTH SIDES OF THE COMPARTMEN 04.11 WATER CLOSETS AND TOILET COMPARTMENTS FOR CHILDREN'S USE: 604.11.1 GENERAL: ACCESSIBLE WATER CLOSETS AND TOILET COMPARTMENTS PRIMARILY FOR CHILDREN'S SE SHALL COMPLY WITH SECTION 604.11.

604 11.2 LOCATION: THE WATER CLOSET PRIMARILY FOR CHILDREN'S USE SHALL BE LOCATED WITH A WALL OR PARTITION TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 12 INCHES 305MM) MINIMUM AND 18 INCHES (455MM) MAXIMUM FROM THE SIDE WALL OR PARTITION. WATER CLOSET OCATED IN AMBULATORY ACCESSIBLE TOILET COMPARTMENTS SPECIFIED IN SECTION 604.10 SHALL BE OCATED AS SPECIFIED IN SECTION 604.2.

-604.11.3 CLEARANCE: A CLEARANCE AROUND THE WATER CLOSET PRIMARILY FOR CHILDREN'S USE OMPLYING WITH SECTION 604.3 SHALL BE PROVIDED.

-604.11.4 HEIGHT: THE HEIGHT OF WATER CLOSET SEATS PRIMARILY FOR CHILDREN'S USE SHALL BE 11 INCHES (280MM) MINIMUM AND 17 INCHES (430MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO THE TOP OF THE SEAT. SEATS SHALL NOT BE SPRUNG TO RETURN TO A LIFTED POSITION. 604.11.5 GRAB BARS: GRAB BARS FOR WATER CLOSETS PRIMARILY FOR CHILDREN'S USE SHALL COMPLY VITH SECTION 604.5 604.11.6 FLUSH CONTROLS: FLUSH CONTROLS PRIMARILY FOR CHILDREN'S USE SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTIONS 309.2 AND 309.4 AND ALL BE INSTALLED 36 INCHES (915MM) MAXIMUM ABOVE THE FLOOR. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET. **EXCEPTION:** IN AMBULATORY ACCESSIBLE COMPARTMENTS MPLYING WITH SECTION 604.10, FLUSH CONTROLS SHALL BE PERMITTED TO BE LOCATED ON EITHER SIDE F THE WATER CLOSET. 604.11.7 DISPENSERS: TOILET PAPER DISPENSERS PRIMARILY FOR CHILDREN'S USE SHALL COMPLY WITH ECTION 309.4. THE OUTLET OF DISPENSERS SHALL BE LOCATED WITHIN AN AREA 24 INCHES (610MM) MINIMUM ND 42 INCHES (1065MM) MAXIMUM FROM THE REAR WALL. THE OUTLET OF THE DISPENSER SHALL BE 14

NCHES (355MM) MINIMUM AND 19 INCHES (485MM) MAXIMUM ABOVE THE FLOOR. THERE SHALL BE A LEARANCE OF 1-1/2 INCHES (38MM) MINIMUM BELOW THE GRAB BAR. DISPENSERS SHALL NOT BE OF A TYPE HAT CONTROLS DELIVERY OR DO NOT ALLOW CONTINUOUS PAPER FLOW 604.11.8 TOILET COMPARTMENTS: TOILET COMPARTMENTS PRIMARILY FOR CHILDREN'S USE SHALL COMPLY VITH SECTION 604.9 AND 604.10, AS APPLICABLE.

FIG. 604.11.2

LOCATION



605.1 GENERAL: ACCESSIBLE URINALS SHALL COMPLY WITH SECTION 605. 805.2 HEIGHT AND DEPTH: URINALS SHALL BE OF THE STALL TYPE OR SHALL BE OF THE WALL HUNG TYPE WITH THE RIM AT 17 CHES (430MM) MAXIMUM ABOVE THE FLOOR. WALL HUNG URINALS SHALL BE 13-1/2 INCHES (345MM) MINIMUM IN DEPTH 605.3 CLEAR FLOOR SPACE: A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR FORWARD APPROACH, 605.4 FLUSH CONTROLS: FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTION 309.

606 LAVATORIES AND SINKS 606 1 GENERAL: ACCESSIBLE LAVATORIES AND SINKS SHALL COMPLY WITH SECTION 606 506.2 CLEAR FLOOR SPACE: A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305.3, POSITIONED FOR FORWARD APPROACH, HALL BE PROVIDED. KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 306 SHALL BE PROVIDED. THE DIP OF THE VERFLOW SHALL NOT BE CONSIDERED IN DETERMINING KNEE AND TOE CLEARANCES. EXCEPTIONS: 1. A PARALLEL APPROACH COMPLYING WITH SECTION 305 CENTERED ON THE SINK, SHALL BE PERMITTED TO A KITCHEN SINK IN A SPACE WHERE A COOK TOP OR CONVENTIONAL RANGE IS NOT PROVIDED. 2. THE REQUIREMENT FOR KNEE IND TOE CLEARANCE SHALL NOT APPLY TO A LAVATORY IN A TOILET OR BATHING FACILITY FOR A SINGLE OCCUPANT, ACCESSED INLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE. **3.** A KNEE CLEARANCE OF 24 INCHES (610MM) MINIMUM ABOVE HE FLOOR SHALL BE PERMITTED AT LAVATORIES AND SINKS USED PRIMARILY BY CHILDREN AGES 6 TĤROUGH 12 WHERE THE RIM OR COUNTER SURFACE IS 31 INCHES (785MM) MAXIMUM ABOVE THE FLOOR 4. A PARALLEL APPROACH COMPLYING WITH SECTION 305 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 ULTI-BOWL SINK. 6. A PARALLEL APPROACH COMPLYING WITH SECTION 305 AND CENTERED ON THE SINK, SHALL BE PERMITTED -606.3 HEIGHT: THE FRONT OF LAVATORIES AND SINKS SHALL BE 34 INCHES (865MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO HE HIGHER OF THE RIM OR COUNTER SURFACE. **EXCEPTION**: A LAVATORY IN A TOILET AND BATHING FACILITY FOR A SINGLE CCUPANT, ACCESSED ONLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE OR PUBLIC USE SHALL NOT BE REQUIRED 606.4 FAUCETS: FAUCETS SHALL COMPLY WITH SECTION 309. HAND-OPERATED METERING FAUCETS SHALL REMAIN OPEN FOR 10

506.5 LAVATORIES WITH ENHANCED REACH RANGE: WHERE ENHANCED REACH RANGE IS REQUIRED AT LAVATORIES, FAUCETS, ND SOAP DISPENSER CONTROLS SHALL HAVE A REACH DEPTH OF 11 INCHES (280MM) MAXIMUM OR, IF AUTOMATIC, SHALL BE CTIVATED WITHIN A REACH DEPTH OF 11 INCHES (280MM) MAXIMUM. WATER AND SOAP FLOW SHALL BE PROVIDED WITH A 606.6 EXPOSED PIPES AND SURFACES: WATER SUPPLY AND DRAINPIPES UNDER LAVATORIES AND SINKS SHALL BE INSULATED ROTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER 07.1 GENERAL: ACCESSIBLE BATHTUBS SHALL COMPLY WITH SECTION 607.

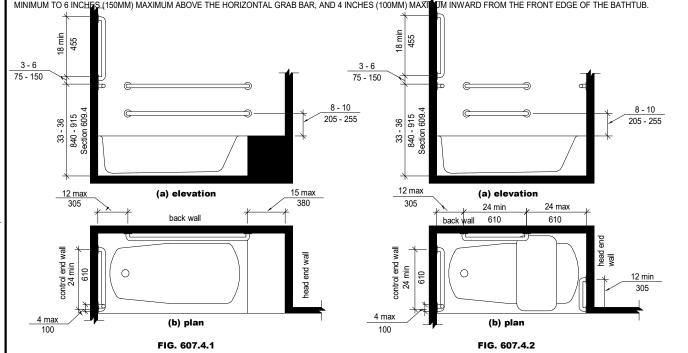
607.2 CLEARANCE: A CLEARANCE IN FRONT OF BATHTUBS EXTENDING THE LENGTH OF THE BATHTUB AND 30 INCHES (760MM) MINIMUM IN DEPTH SHALL BE PROVIDED. WHERE A ERMANENT SEAT IS PROVIDED AT THE HEAD END OF THE BATHTUB THE CLEARANCE SHALL EXTEND 12 INCHES (305MM) MINIMUM BEYOND THE WALL AT THE HEAD END OF THE length of bathtub length of bathtub

607.3 SEAT: A PERMANENT SEAT AT THE HEAD END OF THE BATHTUB OR A REMOVABLE IN-TUB SEAT SHALL BE PROVIDED. SEATS SHALL COMPLY WITH SECTION 610. -607.4 GRAB BARS: GRAB BARS SHALL COMPLY WITH SECTION 609 AND SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 607.4.1 OR 607.4.2 EXCEPTION: GRAB BARS OR PUBLIC USE, PROVIDED REINFORCEMENT HAS BEEN INSTALLED IN WALLS AND LOCATED SO AS TO PERMIT THE INSTALLATION OF GRAB BARS COMPLYING WITH -607.4.1 BATHTUBS WITH PERMANENT SEATS: FOR BATHTUBS WITH PERMANENT SEATS. GRAB BARS COMPLYING WITH SECTION 607.4.1 SHALL BE PROVIDED. -607.4.1.1 BACK WALL: TWO HORIZONTAL GRAB BARS SHALL BE PROVIDED ON THE BACK WALL, ONE COMPLYING WITH SECTION 609.4 AND THE OTHER LOCATED 8 CHES (205MM) MINIMUM AND 10 INCHES (255MM) MAXIMUM ABOVE THE RIM OF THE BATHTUB. EACH GRAB BAR SHALL BE LOCATED 15 INCHES (380MM) MAXIMUM FROM HE HEAD END WALL AND EXTEND TO 12 INCHES (305MM) MAXIMUM FROM THE CONTROL END WALL. -607.4.1.2 CONTROL END WALL: CONTROL END WALL GRAB BARS SHALL COMPLY WITH SECTION 607.4.1.2. EXCEPTION: AN L-SHAPED CONTINUOUS GRAB BAR OF IUIVALENT DIMENSIONS AND POSITIONING SHALL BE PERMITTED TO SERVE THE FUNCTION OF SEPARATE VERTICAL AND HORIZONTAL GRAB BARS. -607.4.1.2.1 HORIZONTAL GRAB BAR: A HORIZONTAL GRAB BAR 24 INCHES (610MM) MINIMUM IN LENGTH SHALL BE PROVIDED ON THE CONTROL END WALL BEGINNING IEAR THE FRONT EDGE OF THE BATHTUB AND EXTENDING TOWARD THE INSIDE CORNER OF THE BATHTUB.

-607.4.1.2.2 VERTICAL GRAB BAR: A VERTICAL GRAB BAR 18 INCHES (455MM) MINIMUM IN LENGTH SHALL BE PROVIDED ON THE CONTROL END WALL 3 INCHES (75MM)

FIG. 607.2

**CLEARANCE FOR BATHTUB** 



GRAB BARS FOR BATHTUBS WITH PERMANENT SEATS GRAB BARS FOR BATHTUBS WITH REMOVABLE IN-TUB SEATS -607.4.2 BATHTUBS WITHOUT PERMANENT SEATS: FOR BATHTUBS WITHOUT PERMANENT SEATS, GRAB BARS COMPLYING WITH SECTION 607.4.2 SHALL BE PROVIDED. -607.4.2.1 BACK WALL: TWO HORIZONTAL GRAB BARS SHALL BE PROVIDED ON THE BACK WALL, ONE COMPLYING WITH SECTION 609.4 AND THE OTHER 8 INCHES (205MM)
MINIMUM AND 10 INCHES (255MM) MAXIMUM ABOVE THE RIM OF THE BATHTUB. EACH GRAB BAR SHALL BE 24 INCHES (610 MM) MINIMUM IN LENGTH, LOCATED 24 INCHES (610 MM) MAXIMUM FROM THE HEAD END WALL AND EXTEND TO 12 INCHES (305 MM) MAXIMUM FROM THE CONTROL END WA

**07.4.2.2 CONTROL END WALL:** CONTROL END WALL GRAB BARS SHALL COMPLY WITH SECTION 607.4.2.2. **EXCEPTION**: AN L-SHA OUS GRAB BAR OF EQUIVALENT DIMENSIONS AND POSITIONING SHALL BE PERMITTED TO SERVE THE FUNCTION OF SEPARATE ERTICAL AND HORIZONTAL GRAB BARS. 607.4.2.2.1 HORIZONTAL GRAB BAR: A HORIZONTAL GRAB BAR 24 INCHES (610 MM) MINIMI IM IN LENGTH SHALL BE PROVIDED ON THE ONTROL END WALL BEGINNING NEAR THE FRONT EDGE OF THE BATHTUB AND EXTEND TOWARD THE INSIDE CORNER OF THE BATHTUB. 607.4.2.2.2 VERTICAL GRAB BAR: A VERTICAL GRAB BAR 18 INCHES (455 MM) MINIMUM IN LENGTH SHALL BE PROVIDED ON THE CONTROL I WALL 3 INCHES (76 MM) MINIMUM TO 6 INCHES (150 MM) MAXIMUM ABOVE THE HORIZONTAL GRAB BAR, AND 4 INCHES (102 MM) MAXIMUM NWARD FROM THE FRONT EDGE OF THE BATHTUB. -607.4.2.3. HEAD END WALL: A HORIZONTAL GRAB BAR 12 INCHES (305 MM) MINIMUM IN LENGTH SHALL BE PROVIDED ON THE HEAD END WAL AT THE FRONT EDGE OF THE BATHTUB.

-607.5 CONTROLS: CONTROLS, OTHER THAN DRAIN STOPPERS, SHALL BE PROVIDED ON AN END WALL, LOCATED BETWEEN THE BATHTUB M AND GRAB BAR, AND BETWEEN THE OPEN SIDE OF THE BÁTHTUB AND THE CENTERLINE OF THE WIDTH OF THE BATHTUB. CONTROLS SHALL COMPLY WITH SECTION 309.4. 507.6 HAND SHOWER: A HAND SHOWER WITH A HOSE 59 INCHES (1500MM) MINIMUM IN LENGTH, THAT CAN BE USED AS BOTH A FIXED HOWER HEAD AND AS A HAND SHOWER. SHALL BE PROVIDED. THE HAND SHOWER SHALL HAVE A CONTROL WITH A NON-POSITIVE SHUT IOT OBSTRUCT THE USE OF GRAB BARS **507.7 BATHTUB ENCLOSURES:** ENCLOSURES FOR BATHTUBS SHALL NOT OBSTRUCT CONTROLS, FAUCETS, SHOWER AND SPRAY UNITS OF

608 SHOWER COMPARTMENTS

FIG. 604.10

AMBULATORY ACCESSIBLE COMPARTM

Note: For adult dimensions see Fig. 604.7

FIG. 604.11.7

CHILDREN'S DISPENSER OUTLET LOCATION

(a) wall hung type

(b) stall type

**HEIGHT AND DEPTH OF URINALS** 

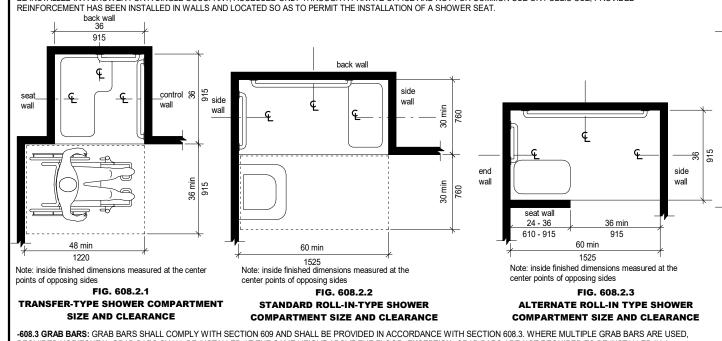
FIG. 606.3

BSTRUCT TRANSFER FROM WHEELCHAIRS ONTO BATHTUB SEATS OR INTO BATHTUBS. ENCLOSURES ON BATHTUBS SHALL NOT HAVE FIG. 607.5 -607.8 WATER TEMPERATURE: BATHTUBS SHALL DELIVER WATER THAT IS 120°F (49°C) MAXIMUM. LOCATION OF BATHTUB CONTROLS 508.1 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. -608.2.1.1 SIZE: 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 (915MM) IN WIDTH AND 36 INCHES (915MM) IN DEPTH, EASURED AT THE CENTER POINT OF OPPOSING SIDES: AN ENTRY 36 INCHES (915MM) MINIMUM IN WIDTH SHALL BÈ PROVÍDED -608.2.1.2 CLEARANCE: A CLEARANCE OF 48 INCHES (1220MM) MINIMUM IN LENGTH MEASURED PERPENDICULAR FROM THE CONTROL WALL, AND 36 INCHES (915MM) MINIMUM IN -306.2.1.3 CLEARANCE: A CLEARANCE OF 46 INCHES (1220MIN) MINIMUM IN LENGTH MEASURED PERFENDICULAR FROM THE CONTROL WALL, AND 36 INCHES (9 19MIN) 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. 508.2.2 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 (1525MM) MINIMUM IN WIDTH AND 30 INCHES (760MM) MINIMUM IN DEPTH, MEASURED AT THE CENTER POINT OF OPPOSING ENDS. AN ENTRY 60 INCHES (1525MM) MINIMUM IN WIDTH SHALL BE PROVIDED. -608,2,2,2 CLEARANCE: A CLEARANCE OF 60 INCHES (1525MM) MINIMUM IN LENGTH ADJACENT TO THE 60 INCH (1525MM) WIDTH OF THE OPEN FACE OF THE SHOWER COMPARTMENT, AND 30 INCHES (760MM) MINIMUM IN DEPTH, SHALL BE PROVIDED. EXCEPTION: A LAVATORY COMPLYING WITH SECTION 606 SHALL BE PERMITTED AT THE END F 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 HE MINIMUM CLEAR INSIDE DIMENSION REQUIRED BY SECTION 608.2.2. 608.2.3 ALTERNATE ROLL-IN-TYPE SHOWER COMPARTMENTS: ALTERNATE ROLL-IN-TYPE SHOWER COMPONENTS SHALL COMPLY WITH SECTION 608.2.3.

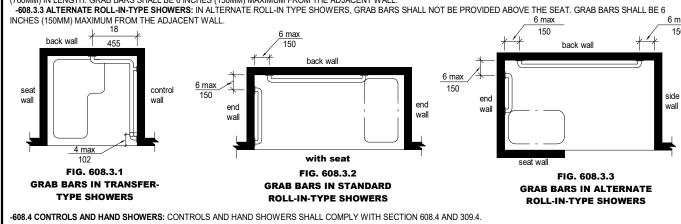
608.2.3.1 SIZE: ALTERNATE ROLL-IN SHOWER COMPARTMENTS SHALL HAVE A CLEAR INSIDE DIMENSION OF 60 INCHES (1525MM) MINIMUM IN WIDTH, AND 36 INCHES (915MM) IN DEPTH. MEASURED AT THE CENTER POINT OF OPPOSING SIDES. AN ENTRY 36 INCHES (915MM) MINIMUM IN WIDTH SHALL BE PROVIDED AT ONE END OF THE 60 INCH (1525MM VIDTH OF THE COMPARTMENT. A SEAT WALL, 24 INCHES (610MM) MINIMUM AND 36 INCHES (915MM) MAXIMUM IN LENGTH, SHALL BE PROVIDED ON THE ENTRY SIDE OF THE 608.2.3.2 SEAT: A FOLDING SEAT COMPLYING WITH SECTION 610 SHALL BE PROVIDED ON THE SEAT WALL OPPOSITE THE BACK 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



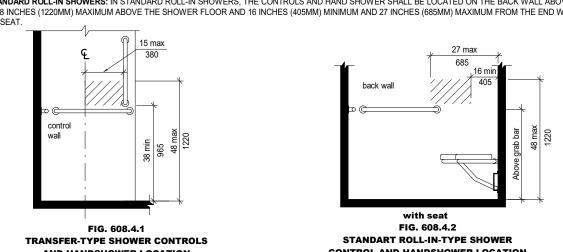
REQUIRED HORIZONTAL GRAB BARS SHALL BE INSTALLED AT THE SAME HEIGHT ABOVE THE FLOOR. EXCEPTION: GRAB BARS ARE NOT REQUIRED TO BE INSTALLED IN A SHOWER FOR A SINGLE OCCUPANT, ACCESSED ONLY THROUGH A PRIVATE OFFICE AND NOT FOR COMMON USE OF PUBLIC USE, PROVIDED REINFORCEMENT HAS BEEN INSTALLED IN WALLS AND LOCATED SO AS TO PERMIT THE INSTALLATION OF GRAB BARS COMPLYING SECTION 608.3. 608,3.1 TRANSFER-TYPE SHOWERS: GRAB BARS FOR TRANSFER TYPE SHOWERS SHALL COMPLY WITH SECTION 608.3.

-608.3.1.1 HORIZONTAL GRAB BARS: HORIZONTAL GRAB BARS SHALL BE PROVIDED ACROSS THE CONTROL WALL AND ON THE BACK WALL TO A POINT 18 INCHES (455MM) -608.3.1.2 VERTICAL GRAB BAR: A VERTICAL GRAB BAR 18 INCHES (455MM) MINIMUM IN LENGTH SHALL BE PROVIDED ON THE CONTROL END WALL 3 INCHES (75MM) MINIMUM ND 6 INCHES (150MM) MAXIMUM ABOVE THE HORIZONTAL GRAB BAR, AND 4 INCHES (100MM) MAXIMUM INWARD FROM THE FRONT EDGE OF THE SHOWER.

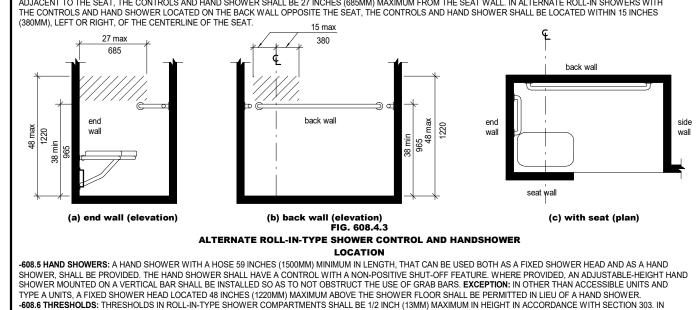
-608.3.2 STANDARD ROLL-IN-TYPE SHOWERS: IN STANDARD ROLL-IN TYPE SHOWERS, A GRAB BAR SHALL BE PROVIDED ON THE BACK WALL BEGINNING AT THE EDGE OF THE T. THE GRAB BARS SHALL NOT BE PROVIDED ABOVE THE SEAT. THE BACK WALL GRAB BAR SHALL EXTEND THE LENGTH OF THE WALL BUT SHALL NOT BE REQUIRED TO (CEED 48 INCHES (1220MM) IN LENGTH. WHERE A SIDE WALL IS PROVIDED OPPOSITE THE SEAT WITHIN 72 INCHES (1830MM) OF THE SEAT WALL. A GRAB BAR SHALL BE VIDED ON THE SIDE WALL OPPOSITE THE SEAT. THE SIDE WALL GRAB BAR SHALL EXTEND THE LENGTH OF THE WALL BUT SHALL NOT BE REQUIRED TO EXCEED 30 INCHES 60MM) IN LENGTH. GRAB BARS SHALL BE 6 INCHES (150MM) MAXIMUM FROM THE ADJACENT WALL. -608.3.3 ALTERNATE ROLL-IN-TYPE SHOWERS: IN ALTERNATE ROLL-IN TYPE SHOWERS, GRAB BARS SHALL NOT BE PROVIDED ABOVE THE SEAT. GRAB BARS SHALL BE 6



-608.4.1 TRANSFER-TYPE SHOWERS: IN TRANSFER-TYPE SHOWERS, THE CONTROLS AND HAND SHOWER SHALL BE LOCATED: 1. ON THE CONTROL WALL OPPOSITE 4E SEAT. 2. AT A HEIGHT OF 38 INCHES (965MM) MINIMUM AND 48 INCHES (1220MM) MAXIMUM ABOVE THE SHOWER FLOOR. 3. 15 INCHES (380MM) MAXIMUM, FROM THE ENTERLINE OF THE CONTROL WALL TOWARD THE SHOWER OPENING 608.4.2 STANDARD ROLL-IN SHOWERS: IN STANDARD ROLL-IN SHOWERS, THE CONTROLS AND HAND SHOWER SHALL BE LOCATED ON THE BACK WALL ABOVE THE GRAB BAR, 48 INCHES (1220MM) MAXIMUM ABOVE THE SHOWER FLOOR AND 16 INCHES (405MM) MINIMUM AND 27 INCHES (685MM) MAXIMUM FROM THE END WALL



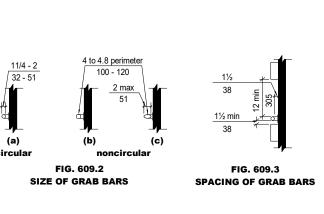
**CONTROL AND HANDSHOWER LOCATION** 608.4.3 ALTERNATE ROLL-IN SHOWERS: IN ALTERNATE ROLL-IN SHOWERS. THE CONTROLS AND HAND SHOWER SHALL BE LOCATED 38 INCHES (965MM) MINIMUM AND INCHES (1220MM) MAXIMUM ABOVE THE SHOWER FLOOR. IN ALTERNATE ROLL-IN SHOWERS WITH CONTROLS AND HAND SHOWER LOCATED ON THE END WALL DJACENT TO THE SEAT. THE CONTROLS AND HAND SHOWER SHALL BE 27 INCHES (685MM) MAXIMUM FROM THE SEAT WALL. IN ALTERNATE ROLL-IN SHOWERS WITH



TRANSFER-TYPE SHOWER COMPARTMENTS, THRESHOLDS 1/2 INCH (13MM) MAXIMUM IN HEIGHT SHALL BE BEVELED, ROUNDED, OR VERTICAL EXCEPTION: IN EXISTING FACILITIES, IN TRANSFER-TYPE SHOWER COMPARTMENTS WHERE PROVISION OF A THRESHOLD 1/2 INCH (13MM) IN HEIGHT WOULD DISTURB THE STRUCTURAL REINFORCEMENT OF THE FLOOR SLAB, A THRESHOLD 2 INCHES (51MM) MAXIMUM IN HEIGHT SHALL BE PERMITTED.

-608.7 SHOWER ENCLOSURES: SHOWER COMPARTMENT ENCLOSURES FOR SHOWER COMPARTMENTS SHALL NOT OBSTRUCT CONTROLS OR OBSTRUCT TRANSFER FROM -608.8 WATER TEMPERATURE: SHOWERS SHALL DELIVER WATER THAT IS 120°F (49°C) MAXIMUM

609 GRAB BARS -609.1 GENERAL: GRAB BARS IN ACCESSIBLE TOILET OR BATHING FACILITIES SHALL COMPLY -609.2 CROSS SECTION: GRAB BARS SHALL HAVE A CROSS SECTION COMPLYING WITH 609.2.1 CIRCULAR CROSS SECTION: GRAB BARS WITH A CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF 1-1/4 INCH (32MM) MINIMUM AND 2 INCHES (51MM) MAXIMUM 609.2.2 NON-CIRCULAR CROSS SECTION: GRAB BARS WITH A NON-CIRCULAR CROSS ECTION SHALL HAVE A CROSS SECTION DIMENSION OF 2 INCHES (51MM) MAXIMUM, AND A 'ERIMETER DIMENSION OF 4 INCHES (100MM) MINIMUM AND 4.8 INCHES (120MM) MAXIMUM. -609.3 SPACING: THE SPACE BETWEEN THE WALL AND THE GRAB BAR SHALL BE 1-1/2 INCHES (38MM). THE SPACE BETWEEN THE GRAB BAR AND PROJECTING OBJECTS BELOW AND AT THE ENDS OF THE GRAB BAR SHALL BE 1-1/2 INCHES (38MM) MINIMUM. THE SPACE BETWEEN THE GRAB BAR AND PROJECTING OBJECTS ABOVE THE GRAB BAR SHALL BE 12 INCHES 05MM) MINIM IM **EXCEPTIONS: 1** THE SPACE BETWEEN THE GRAB BARS AND SHOWER ONTROLS, SHOWER FITTINGS, AND OTHER GRAB BARS ABOVE THE GRAB BAR SHALL BE ERMITTED TO BE 1-1/2 INCHES (38MM) MINIMUM. 2. RECESSED DISPENS FROM THE WALL 1/4 INCH (6 4MM) MAXIMUM MEASURED FROM THE FACE OF THE DISPENSE ND COMPLYING WITH SECTION 604.7 SHALL BE PERMITTED WITHIN THE 12 INCH (305MN SPACE ABOVE THE 1-1/2 INCH (38MM) SPACES BELOW AND AT THE ENDS OF THE GRAB BAR.



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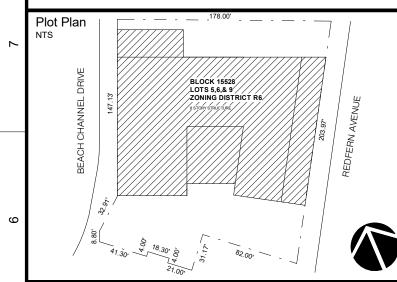
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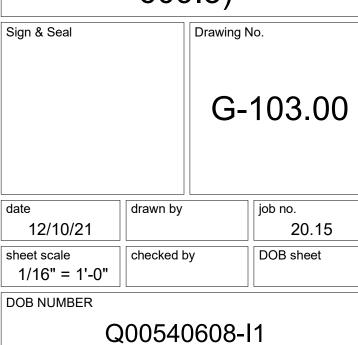
CODE CONSULTANT William Vitacco Associates Ltd 299 Broadway, 5th Floor, New York, NY 10007



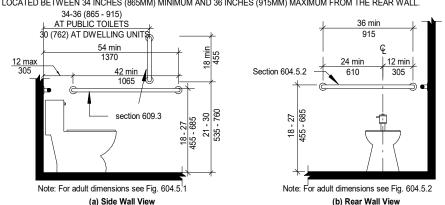
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| l | No. | Date     | Description         |
| ı | 1.1 | 06/14/21 | DOB PROGRESS SET    |
| ı | 1.2 | 06/28/21 | ISSUED FOR FILING   |
| ı | 1.3 | 08/24/21 | HPD BLDS SUBMISSION |
| ı | 2   | 08/13/21 | 50% CD              |
| ı | 3   | 10/29/21 | 90% CD              |
| 1 | 3.1 | 11/08/21 | HPD BLDS SUBMISSION |
| 1 | 4   | 12/10/21 | 100% CD             |
| ı |     |          |                     |

ANSI GENERAL NOTES (CH. 504.7 -609.3)



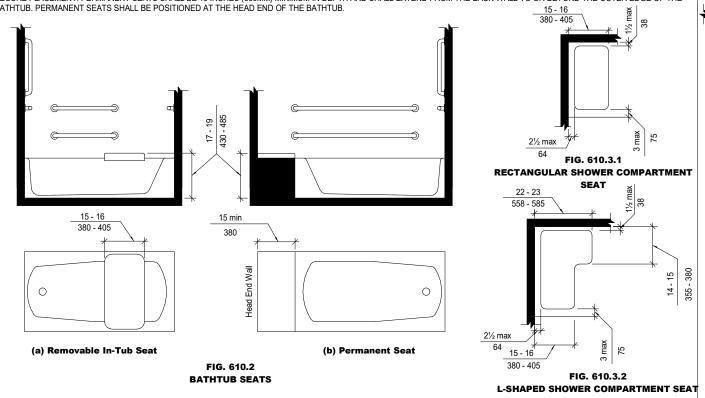
9.4.1 GENERAL: GRAB BARS SHALL BE INSTALLED IN A HORIZONTAL POSITION, 33 INCHES (840MM) MINIMUM AND 36" INCHES (915MM) MAXIMUM ABOVE THE FLOOR MEASURED THE TOP OF THE GRIPPING SURFACE OR SHALL BE INSTALLED AS REQUIRED BY ITEMS 1 THROUGH 3, 1, THE LOWER GRAB BAR ON THE BACK WALL OF A BATHTUB SHALL MPLY WITH SECTION 607.4.1.1 OR 607.4.2.1. 2. VERTICAL GRAB BARS SHALL COMPLY WITH SECTIONS 604.5.1, 607.4.1.2.2, 607.4.2.2, AND 608.3.1.2. 3. GRAB BARS AT WATER SETS PRIMARILY FOR CHILDREN'S USE SHALL COMPLY WITH SECTION 609.4.2. -609.4.2 POSITION OF CHILDREN'S GRAB BARS: AT WATER CLOSETS PRIMARILY FOR CHILDREN'S USE COMPLYING WITH SECTION 604.11, GRAB BARS SHALL BE INSTALLED IN A HORIZONTAL POSITION 18 INCHES (455MM) MINIMUM AND 27 INCHES (685MM) MAXIMUM ABOVE THE FLOOR MEASURED TO THE TOP OF THE GRIPPING SURFACE. A VERTICAL GRAB BAR SHALL BE MOUNTED WITH THE BOTTOM OF THE BAR LOCATED BETWEEN 21 INCHES (535MM) MINIMUM AND 30 INCHES (760MM) MAXIMUM ABOVE THE FLOOR AND WITH THE ITERLINE OF THE BAR LOCATED BETWEEN 34 INCHES (865MM) MINIMUM AND 36 INCHES (915MM) MAXIMUM FROM THE REAR WALL



POSITION OF CHILDREN'S GRAB BARS 609.5 SURFACE HAZARDS: GRAB BARS, AND ANY WALL OR OTHER SURFACES ADJACENT TO GRAB BARS, SHALL BE FREE OF SHARP OR ABRASIVE ELEMENTS. EDGES SHALL BE

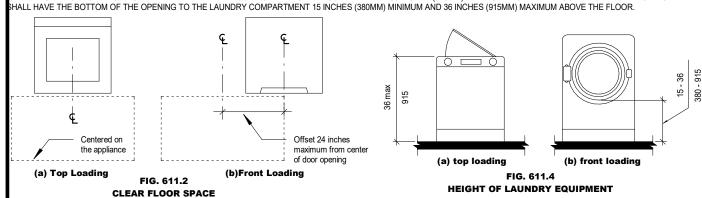
609 6 FITTINGS: GRAB BARS SHALL NOT ROTATE WITHIN THEIR FITTINGS. 509,7 INSTALLATION AND CONFIGURATION: GRAB BARS SHALL BE INSTALLED IN ANY MANNER THAT PROVIDES A GRIPPING SURFACE AT THE LOCATIONS SPECIFIED IN THIS INDARD AND DOES NOT OBSTRUCT THE CLEAR FLOOR SPACE. HORIZONTAL AND VERTICAL GRAB BARS SHALL BE PERMITTED TO BE SEPARATE BARS, A SINGLE PIECE BAR, OR 509.8 STRUCTURAL STRENGTH: ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHERE A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS (1112N) IS PLIED AT ANY POINT ON THE GRAB BAR. FASTENER MOUNTING DEVICE. OR SUPPORTING STRUCTURE

610.1 GENERAL: SEATS IN ACCESSIBLE BATHTUBS AND SHOWER COMPARTMENTS SHALL COMPLY WITH SECTION 610.
610.2 BATHTUB SEATS: THE HEIGHT OF BATHTUB SEATS SHALL BE 17 INCHES (430MM) MINIMUM TO 19 INCHES (485MM) MAXIMUM ABOVE THE BATHROOM FLOOR, MEASURED TO THE OP OF THE SEAT. REMOVABLE IN TUB SEATS SHALL BE 15 INCHES (380MM) MINIMLIM AND 16 INCHES (405MM) MAXIMLIM IN DEPTH. REMOVABLE IN TUB SEATS SHALL BE CAPABLE O CURE PLACEMENT. PERMANENT SEATS SHALL BE 15 INCHES (380MM) MIŃIMUM IN DEPTH AND SHALL EXTEND FROM THE BACK WALL TO OR BEYOND THE OUTER EDGE OF THE



0.3 SHOWER COMPARTMENTS SEATS: THE HEIGHT OF SHOWER COMPARTMENT SEATS SHALL BE 17 INCHES (430MM) MINIMUM AND 19 INCHES (485MM) MAXIMUM ABOVE THE HROOM FLOOR, MEASURED TO THE TOP OF THE SEAT. IN TRANSFER-TYPE AND ALTERNATE ROLL-IN-TYPE SHOWERS, THE SEAT SHALL EXTEND ALONG THE SEAT WALL TO A NT WITHIN 3 INCHES (75MM) OF THE COMPARTMENT ENTRY. IN STANDARD ROLL-IN-TYPE SHOWERS, THE SEAT SHALL EXTEND FROM THE CONTROL WALL TO A POINT WITHIN 3 INCHES (75MM) OF THE COMPARTMENT ENTRY, SEATS SHALL COMPLY WITH SECTION 610.3.1 OR 610.3.2 -610.3.1 RECTANGULAR SEATS: THE REAR EDGE OF A RECTANGULAR SEAT SHALL BE 2-1/2 INCHES (64MM) MAXIMUM AND THE FRONT EDGE 15 INCHES (380MM) MINIMUM AND 16 CHES (405MM) MAXIMUM FROM THE SEAT WALL. THE SIDE EDGE OF THE SEAT SHALL BE 1-1/2 INCHES (38MM) MAXIMUM FROM THE BACK WALL OF A TRANSFER-TYPE SHOWER ) 1-1/2 INCHES (38MM) MAXIMUM FROM THE CONTROL WALL OF A ROLL-IN-TYPE SHOW ER. 610.3.2 L-SHAPED SEATS: THE REAR EDGE OF AN L-SHAPED SEAT SHALL BE 2-1/2 INCHES (64MM) MAXIMUM AND THE FRONT EDGE 15 INCHES (380MM) MINIMUM AND 16 INCHES MM) MAXIMUM FROM THE SEAT WALL. THE REAR EDGE OF THE "L" PORTION OF THE SEAT SHALL BE 1-1/2 INCHES (38MM) MAXIMUM FROM THE WALL AND THE FRONT EDGE ALL BE 14 INCHES (355MM) MINIMUM AND 15 INCHES (380MM) MAXIMUM FROM THE WALL. THE END OF THE "L" SHALL BE 22 INCHES (560MM) MINIMUM AND 23 INCHES (585MM 110.4 STRUCTURAL STRENGTH: ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHERE A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS (1112N) IS PLIED AT ANY POINT ON THE SEAT. FASTENER MOUNTING DEVICE. OR SUPPORTING STRUCTURE.

11.1 GENERAL: ACCESSIBLE WASHING MACHINES AND CLOTHES DRYERS SHALL COMPLY WITH SECTION 611. 11.2 CLEAR FLOOR SPACE: A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305. POSITIONED FOR PARALLEL APPROACH, SHALL BE PROVIDED, FOR TOP LOADING HINES, THE CLEAR FLOOR SPACE SHALL BE CENTERED ON THE APPLIANCE. FOR FRONT LOADING MACHINES, THE CENTERLINE OF THE CLEAR FLOOR SPACE SHALL BE FSET 24 INCHES (610MM) MAXIMUM FROM THE CENTERLINE OF THE DOOR OPENING. 11.3 OPERABLE PARTS: OPERABLE PARTS, INCLUDING DOORS, LINT SCREENS, DETERGENT, AND BLEACH COMPARTMENTS, SHALL COMPLY WITH SECTION 309. 11.4 HEIGHT: TOP LOADING MACHINES SHALL HAVE THE DOOR TO THE LAUNDRY COMPARTMENT 36 INCHES (915MM) MAXIM IM ABOVE THE FLOOR ERROR LOADING MACHINES



APTER 7. COMMUNICATION ELEMENTS AND FEATURES

101.1 SCOPE: COMMUNICATIONS ELEMENTS AND FEATURES REQUIRED TO BE ACCESSIBLE BY THE SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL OMPLY WITH THE APPLICABLE PROVISIONS OF CHAPTER 7 702.1 GENERAL: ACCESSIBLE AUDIBLE AND VISIBLE ALARMS AND NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72 LISTED IN SECTION 105.2.2. BE

ERED BY A COMMERCIAL LIGHT AND POWER SOURCE, BE PERMANENTLY CONNECTED TO THE WIRING OF THE PREMISES ELECTRIC SYSTEM, AND BE PERMANENTLY 703.1 GENERAL: ACCESSIBLE SIGNS SHALL COMPLY WITH SECTION 703. TACTILE SIGNS SHALL CONTAIN BOTH RAISED CHARACTERS AND BRAILLE. WHERE SIGNS WITH BOTH SUAL AND RAISED CHARACTERS ARE REQUIRED. EITHER ONE SIGN WITH BOTH VISUAL AND RAISED CHARACTERS. OR TWO SEPARATE SIGNS. ONE WITH VISUAL AND ONE TH RAISED CHARACTERS, SHALL BE PROVIDED TERIOR SIGNS THAT ARE NOT LOCATED AT THE DOOR TO THE SPACE THEY SERVE SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 703.3

03.1.1 DESIGNATIONS: INTERIOR AND EXTERIOR SIGNS IDENTIFYING PERMANENT ROOMS AND SPACES SHALL COMPLY WITH SECTIONS 703.1, 703.2, AND 703.3. EXCEPTION: 103.1.2 DIRECTIONAL AND INFORMATIONAL SIGNS: SIGNS THAT PROVIDE DIRECTION TO OR INFORMATION ABOUT INTERIOR SPACES AND FACILITIES OF THE SITE SHALL COMPLY 103.1.3 PICTOGRAMS: WHERE PICTOGRAMS ARE PROVIDED AS DESIGNATIONS OF PERMANENT INTERIOR ROOMS AND SPACES. THE PICTOGRAMS SHALL COMPLY WITH SECTION 3.5 AND SHALL HAVE TEXT DESCRIPTORS LOCATED DIRECTLY BELOW THE PICTOGRAM FIELD AND COMPLYING WITH SECTION 703.2 AND 703.3. **EXCEPTION:** PICTOGRAMS THAT ROVIDE INFORMATION ABOUT A ROOM OR SPACE, SUCH AS "NO SMOKING", OCCUPANT LOGOS, AND THE INTERNATIONAL SYMBOL OF ACCESSIBILITY, ARE NOT REQUIRED TO 03.2 VISUAL CHARACTERS:

33.2.1 GENERAL: VISUAL CHARACTERS SHALL COMPLY WITH THE FOLLOWING: 1. VISUAL CHARACTERS THAT ALSO SERVE AS RAISED CHARACTERS SHALL COMPLY WITH TION 703.3. OR 2. VISUAL CHARACTERS ON VMS SIGNAGE SHALL COMPLY WITH SECTION 703.7. OR 3. VISUAL CHARACTERS NOT COVERED IN ITEMS 1 AND 2 SHALL COMPLY TH SECTION 703.2. EXCEPTION: THE VISUAL AND RAISED REQUIREMENTS OF ITEM 1 SHALL BE PERMITTED TO BE PROVIDED BY TWO SEPARATE SIGNS THAT PROVIDE RRESPONDING INFORMATION PROVIDED ONE SIGN COMPLIES WITH SECTION 703.2 AND THE SECOND SIGN COMPLIES WITH SECTION 703.3. 3.2.2 CASE: CHARACTERS SHALL BE UPPERCASE, LOWERCASE, OR A COMBINATION OR BOTH.

103.2.3 STYLE: CHARACTERS SHALL BE CONVENTIONAL IN FORM CHARACTERS SHALL NOT BE ITALIC OBLIQUE SCRIPT HIGHLY DECORATIVE OR OF OTHER UNUSUAL FORMS 33.2.4 CHARACTER HEIGHT: THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF A FONT. THE UPPERCASE LETTER "I" THE FONT SHALL HAVE A MINIMUM HEIGHT COMPLYING WITH TABLE 703.2.4. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE ARACTER AN AN OBSTRUCTION PREVENTING FURTHER APPROACH TOWARDS THE SIGN. EXCEPTION: IN ASSEMBLY SEATING WHERE THE MAXIMUM VIEWING DISTANCE IS 100 ET (30.5M) OR GREATER, THE HEIGHT OF THE UPPERCASE "I" OF THE FONTS SHALL BE PERMITTED TO BE 1 INCH (25MM) FOR EVERY 30 FEET (9 145 MM) OF VIEWING DISTANCI VIDED THE CHARACTER HEIGHT IS 8 INCHES (205 MM) MINIMUM. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND HERE SOMEONEIS EXPECTED TO VIEW THE SIGN. TABLE 703 2 4 VISUAL CHARACTER HEIGHT

| Height above Floor to Baseline of Character                               | <b>Horizontal Viewing Distance</b> | Minimum Character Height   |
|---|------------------------------------|--|
| 40 inches (1015 mm) to less than or equal to 70 inches (1780              | Less than 6 feet (1830 mm)         | 5/8 inch (16 mm)   |
| mm)   | 6 feet (1830 mm) and greater       | 5/8 inch (16 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 6 feet (1830 mm)  |
| 0 1 1 70: 1 (4700 ) 1 10  | Less than 15 feet (4570 mm)        | 2 inches (51 mm)   |
| Greater than 70 inches (1780 mm) to less or equal to 120 inches (3050 mm) | 15 feet (4570 mm) and greater      | 2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 15 feet (4570 mm) |
|   | Less than 21 feet (6400 mm)        | 3 inches (75 mm)   |
| Greater than 120 inches (3050 mm)   | 21 feet (6400 mm) and greater      | 3 inches (75 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6400 mm) |

RCASE LETTER "O" OF A FONT SHALL BE 55 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE "I" OF THE FONT 103,2.6 STROKE WIDTH: THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE STROKE WIDTH OF ALL CHARACTERS OF A FONT. THE STROKE WIDTH SHALL PERCENT MINIMUM AND 30 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE "I" OF THE FONT. 03.2.7 CHARACTER SPACING: SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT CHARACTERS WITHIN A MESSAGE. EXCLUDING WORD SPACES. CING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 10 PERCENT MINIMUM AND 35 PERCENT MAXIMUM OF THE CHARACTER HEIGHT. 703.2.8 LINE SPACING: SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE 135 PERCENT MINIMUM AND 170 PERCENT XIMUM OF THE CHARACTER HEIGHT. EXCEPTION: IN ASSEMBLY SEATING WHERE THE MAXIMUM VIEWING DISTANCE IS 100 FEET (30.5M) OR GREATER, THE SPACING BETWEEN IE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE PERMITTED TO BE 102 PERCENT MINIMUM AND 170 PERCENT MAXIMUM OF THE CHARACTER 703.2.9 HEIGHT ABOVE FLOOR: VISUAL CHARACTERS SHALL BE 40 INCHES (1015MM) MINIMUMABOVE THE FLOOR OF THE VIEWING POSITION. MEASURED TO THE BASELINE OF THE IARACTER. HEIGHT SHALL COMPLY WITH TABLE 703.2.4, BASE ON THE SIZE OF THE CHARACTERS ON THE SIGN. EXCEPTION: VISUAL CHARACTERS INDICATING ELEVATOR CAR

NTROLS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 703.2.9. 03.3 RAISED CHARACTERS: 03.3.1 GENERAL. RAISED CHARACTERS SHALL COMPLY WITH SECTION 703.3, AND SHALL BE DUPLICATED IN BRAILLE COMPLYING WITH SECTION 703.4.

**)3.3.2 DEPTH.** RAISED CHARACTERS SHALL BE RAISED 1/32 INCH (0.8 MM) MINIMUM ABOVE THEIR BACKGROUND 3.3.3 CASE. CHARACTERS SHALL BE UPPERCASE. 13.3.4 STYLE. CHARACTERS SHALL BE SANS SERIF. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS.
703.3.5 CHARACTER HEIGHT. THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF A FONT. HE HEIGHT OF THE UPPERCASE LETTER "I" OF THE FONT, MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER, SHALL BE 5/8 INCH (16

M) MINIMUM AND 2 INCHES (51 MM) MAXIMUM **EXCEPTION**: WHERE SEPARATE RAISED AND VISUAL CHARACTERS WITH THE SAME INFORMATION KÉ PROVIDED, THE HEIGHT OF THE RAISED UPPERCASE LETTER "I" SHALL BE PERMITTED TO BE 1/2 INCH (13 MM) MINIMUM. 103.3.6 CHARACTER WIDTH. THE UPPERCASE LETTER "10" SHALL BE USED TO DETERMINE THE ALLOWABLE WIDTH OF ALL CHARACTERS OF A FONT IE WIDTH OF THE UPPERCASE LETTER "0" OF THE FONT SHALL BE 55 PERCENT MINIMUM AND 110 PERCENT MAXIMUM OF THE HEIGHT OF THE

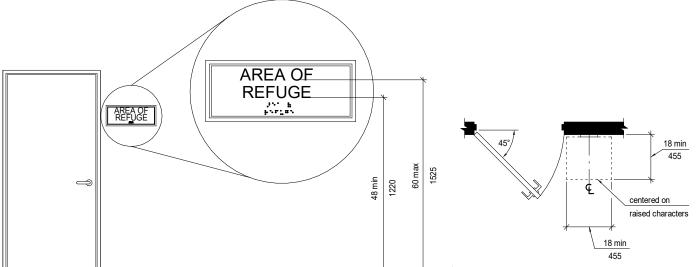
103.3.7 STROKE WIDTH. RAISED CHARACTER STROKE WIDTH SHALL COMPLY WITH SECTION 703.3.7. THE UPPERCASE LETTER "I" OF THE FONT SHALL USED TO DETERMINE THE 03.3.7.1 MAXIMUM. THE STROKE WIDTH SHALL BE 15 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I" MEASURED AT THE TOP RFACE OF THE CHARACTER, AND 30 PERCENT MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER "I" MEASURED AT THE BASE OF THE FIG. 703.3.5 HARACTER.

103.3.7.2 MINIMUM. WHEN CHARACTERS ARE BOTH VISUAL AND RAISED, THE STROKE WIDTH SHALL BE 10 PERCENT MINIMUM OF THE HEIGHT OF THE CHARACTER HEIGHT PPERCASE LETTER "I".

703.3.8 CHARACTER SPACING. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS WITHIN A MESSAGE EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8 INCH (3.2 MM) MINIMUM MEASURED AT THE TOP SURFACE OF THE ARACTERS, 1/16 INCH (1.6 MM) MINIMUM MEASURED AT THE BASE OF THE CHARACTERS, AND FOUR TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. IARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE FLEMENTS 3/8 INCH (9.5 MM) MINIMLIM -703.3.9 LINE SPACING. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135 PERCENT MINIMUM AND 170

PERCENT MAXIMUM OF THE RAISED CHARACTER HEIGHT. -703.3.10 HEIGHT ABOVE FLOOR. RAISED CHARACTERS SHALL BE 48 INCHES (1220 MM) MINIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE LOWEST RAISED CHARACTER AND 60 INCHES (1525 MM) MAXIMUM ABOVE THE FLOOR. MEASURED TO THE BASELINE OF THE HIGHEST RAISED CHARACTER. EXCEPTION: RAISED CHARACTER: FOR ELEVATOR CAR CONTROLS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 703.3.10. -703.3.11 LOCATION. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT A DOOR, THE SIGN SHALL BE ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAVES, THE SIGN SHALL BE TO THE RIGHT OF THE RIGHT-HAND DOOR. WHERE THERE IS NO WALL SPACE ON THE LATCH SIDE OF A SINGLE DOOR, OR TO THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING RAISED CHARACTERS AND BRAILLE SHALL BE LOCATED SO THAT A CLEAR FLOOR AREA 18 INCHES (455 MM) MINIMUM BY 18 INCHES (455 MM) MINIMUM, CENTERED ON THE RAISED CHARACTERS IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING

BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION. EXCEPTION: SIGNS CONTAINING RAISED CHARACTERS AND BRAILLE SHALL BE PERMITTED ON THE PUSH



Note: For braille charater mounting height see Section 703.4.5 FIG. 703.3.10 HEIGHT OF RAISED CHARACERS ABOVE FLOOF

SIDE OF DOORS WITH CLOSERS AND WITHOUT HOLD-OPEN DEVICES.

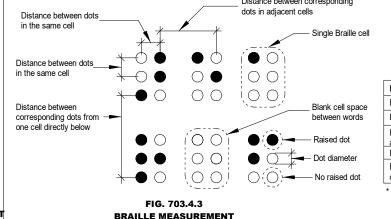
FIG. 703.3.11 **LOCATION OF SIGNS AT DOORS** -703.3.12 FINISH AND CONTRAST. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND. WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND. OR DARK CHARACTERS ON A LIGHT BACKGROUND. EXCEPTION: WHERE SEPARATE RAISED CHARACTER

-703.4 BRAILLE -703.4.1 GENERAL. BRAILLE SHALL BE CONTRACTED (GRADE 2) BRAILLE AND SHALL COMPLY WITH SECTION 703.4. EXCEPTION: ELEVATOR CAR CONTROLS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 703.4.5.

-703.4.2 UPPERCASE LETTERS. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER

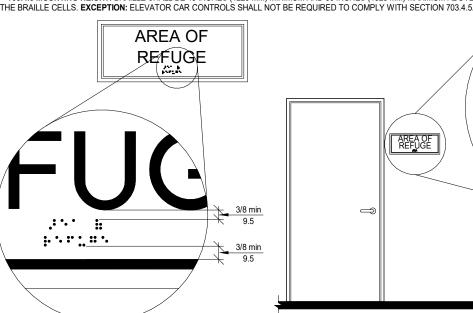
AND VISUAL CHARACTERS WITH THE SAME INFORMATION ARE PROVIDED, RAISED CHARACTERS ARE NOT REQUIRED TO HAVE NONGLARE FINISH OR TO CONTRAST WITH

INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS, OR ACRONYMS. -703.4.3 DIMENSIONS. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE AND SHALL COMPLY WITH TABLE 703.4.3



| Minimum and Maximum in incl        |
|------------------------------------|
| 0.059 (1.5 mm) to 0.063 (1.6 mm)   |
| 0.090 (2.3 mm) to 0.100 (2.5 mm)   |
| 0.241 (6.1 mm) to 0.300 (7.6 mm)   |
| 0.025 (0.6 mm) to 0.037 (0.9 mm)   |
| 0.395 (10.0 mm) to 0.400 (10.2 mm) |
|                                    |

-703.4.4 POSITION. BRAILLE SHALL BE BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTILINED, BRAILLE SHALL BE PLACED BELOW ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8 INCH (9.5 MM) MINIMUM FROM ANY OTHER RAISED CHAR- I ACTERS AND 3/8 INCH (9.5 MM) MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS BRAILLE PROVIDED ON ELEVATOR CAR CONTROLS SHALL BE SEPARATED 3/16 INCH (4.8 MM) MINIMUM EITHER DIRECTLY BELOW OR ADJACENT TO THE CORRESPONDING -703.4.5 MOUNTING HEIGHT. BRAILLE SHALL BE 48 INCHES (1220 MM) MINIMUM AND 60 INCHES (1525 MM) MAXIMUM ABOVE THE FLOOR. MEASURED TO THE BASELINE OF



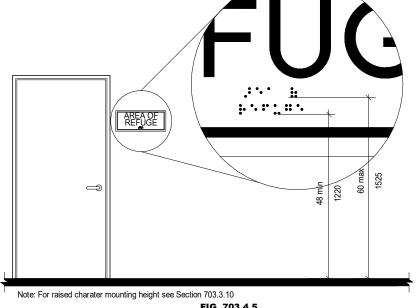


FIG. 703.4.4 **POSITION OF BRAILLE** 

FIG. 703.4.5 HEIGHT OF BRAILLE CHARACERS ABOVE FLOOR

-703.5.1 GENERAL. PICTOGRAMS SHALL COMPLY WITH SECTION 703.5. -703.5.2 PICTOGRAM FIELD. PICTOGRAMS SHALL HAVE A FIELD 6 INCHES (150 MM) MINIMUM IN HEIGHT. CHARACTERS OR BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD. -703.5.3 FINISH AND CONTRAST. PICTOGRAMS AND THEIR FIELDS SHALL HAVE A NONGLARE FINISH. PICTOGRAMS SHALL CONTRAST ITH THEIR FIELDS, WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD -703.6 SYMBOLS OF ACCESSIBILITY. -703.6.1 GENERAL. SYMBOLS OF ACCESSIBILITY SHALL COMPLY WITH SECTION 703.6.7 -703.6.2 FINISH AND CONTRAST. SYMBOLS OF ACCESSIBILITY AND THEIR BACKGROUNDS SHALL HAVE A NON-GLARE FINISH. SYMBOLS ACCESSIBILITY SHALL CONTRAST WITH THEIR BACKGROUNDS, WITH EITHER A LIGHT SYMBOL ON A DARK BACKGROUND OR A DARK

SYMBOL ON A LIGHT BACKGROUND. -703.6.3.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY. THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL COMPLY WITH FIGURE -703.6.3.2 INTERNATIONAL SYMBOL OF TTY. THE INTERNATIONAL SYMBOL OF TTY SHALL COMPLY WITH FIGURE 703.6.3.2 -703.6.3.3 ASSISTIVE LISTENING SYSTEMS. ASSISTIVE LISTENING SYSTEMS SHALL BE IDENTIFIED BY THE INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS COMPLYING WITH FIGURE 703 6 3 3 -703.6.3.4 VOLUME-CONTROLLED TELEPHONES. TELEPHONES WITH VOLUME CONTROLS SHALL BE IDENTIFIED BY A PICTOGRAM OF A



FIG. 703.6.3.1

INTERNATIONAL SYMBOL

OF ACCESSIBILITY

-703.7 VARIABLE MESSAGE SIGNS

CHARACTERS ON THE SIGN.

-703.7.2 CASE, LOW RESOLUTION VMS CHARACTERS SHALL BE UPPERCASE.







FIG. 703.6.3.2 INTERNATIONAL TTY SYMBOL

VOLUME-CONTROLLED INTERNATIONAL SYMBO TELEPHONE OF ACCESS FOR HEARING 703.7.1 GENERAL. HIGH RESOLUTION VARIABLE MESSAGE SIGN (VMS) CHARACTERS SHALL COMPLY WITH SECTIONS 703.2 AND 703.7.12 THROUGH 703.7.14. LOW RESOLUTION VARIABLE MESSAGE SIGN (VMS) CHARACTERS SHALL COMPLY WITH SECTION 703.7. EXCEPTION: THEATRICAL PERFORMANCE RELATED VMS SIGNS. ICLUDING BUT NOT LIMITED TO, TEXT AND TRANSLATION DELIVERY SYSTEMS, SURTITLES AND SUBTITIES, SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 703.7.1.

-703.7.3 STYLE. LOW RESOLUTION VMS CHARACTERS SHALL BE CONVENTIONAL IN FORM, SHALL BE SAN SERIF, AND SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OF OTHER UNUSUAL FORMS. -703.7.4 CHARACTER HEIGHT. THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL LOW RESOLUTION VMS CHARACTERS OF A FONT. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND AN OBSTRUCTION PREVENTING FURTHER APPROACH TOWARDS THE SIGN. THE UPPERCASE LETTER "I" OF THE FONT SHALL HAVE A MINIMUM HEIGHT COMPLYING WITH TABLE 703.7.4. EXCEPTION: IN ASSEMBLY SEATING WHERE THE MAXIMUM VIEWING DISTANCE IS 100 FEET (30.5 M) OR GREATER, THE HEIGHT OF THE UPPERCASE "I" OF LOW RESOLUTION VMS FONTS SHALL BE PERMITTED TO BE 1 INCH (25 MM) FOR EVERY 30 FEET (9145 MM) OF VIEWING DISTANCE, PROVIDED THE CHARACTER HEIGHT IS 8 INCHES (205 MM) MINIMUM. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND WHERE SOMEONE IS EXPECTED TO VIEW THE SIGN.

| TABLE 703.  | 7.4 - LOW RESOLUTION VMS CHARACT | ER HEIGHT   |
|---|----------------------------------|---|
| Height above Floor to Baseline of Character                               | Horizontal Viewing Distance      | Minimum Character Height  |
| 40 inches (1015 mm) to less than or equal to 70 inches (1780              | Less than 10 feet (3050 mm)      | 2 inches (51 mm)  |
| mm)   | 10 feet (3050 mm) and greater    | 2 inches (51 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 10 feet (3050 mm)  |
| Constant have 70 in the co (4700 man) to least an arrival to 400          | Less than 15 feet (4570 mm)      | 3 inches (75 mm)  |
| Greater than 70 inches (1780 mm) to less or equal to 120 inches (3050 mm) | 15 feet (4570 mm) and greater    | 3 inches (75 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 15 feet (4570 mm)  |
|   | Less than 20 feet (6095 mm)      | 4 inches (100 mm)   |
| Greater than 120 inches (3050 mm)   | 20 feet (6095 mm) and greater    | 4 inches (100 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 20 feet (6095 mm) |

-703.7.5 CHARACTER WIDTH. THE UPPERCASE LETTER "0" SHALL BE USED TO DETERMINE THE ALLOWABLE WIDTH OF ALL LOW RESOLUTION VMS CHARACTERS OF A FONT. LOW RESOLUTION VMS CHARACTERS SHALL COMPLY WITH THE PIXEL COUNT FOR CHARACTER WIDTH IN TABLE 703.7.5. -703.7.6 STROKE WIDTH. THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE STROKE WIDTH OF ALL LOW RESOLUTION VMS CHARACTERS OF A FON LOW RESOLUTION VMS CHARACTERS SHALL COMPLY WITH THE PIXEL COUNT FOR STROKE WIDTH IN TABLE 703.7.5. -703,7,7 CHARACTER SPACING, SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT LOW RESOLUTION VMS CHARACTERS WITHIN A MESSAGE EXCLUDING WORD SPACES, LOW RESOLUTION VMS CHARACTER SPACING SHALL COMPLY WITH THE PIXEL COUNT FOR CHARACTER SPACING IN TABLE 703.7.5. -703.7.8 LINE SPACING. LOW RESOLUTION VMS CHARACTERS SHALL COMPLY WITH SECTION 703.2.8. -703.7.9 HEIGHT ABOVE FLOOR. LOW RESOLUTION VMS CHARACTERS SHALL BE 40 INCHES (1015 MM) MINIMUM ABOVE THE FLOOR OF THE VIEWING POSITION, MEASURED TO THE BASELINE OF THE CHARACTER, HEIGHTS OF LOW RESOLUTION VARIABLE MESSAGE SIGN CHARACTERS SHALL COMPLY WITH TABLE 703.7.4. BASED ON THE SIZE OF THI

-703.7.10 FINISH. THE BACKGROUND OF LOW RESOLUTION VMS CHARACTERS SHALL HAVE A NON-GLARE FINISH. -703.7.11 CONTRAST. LOW RESOLUTION VMS CHARACTERS SHALL BE LIGHT CHARACTERS ON A DARK BACKGROUND. 703.7.12 PROTECTIVE COVERING. WHERE A PROTECTIVE LAYER IS PLACED OVER VMS CHARACTERS THROUGH WHICH THE VMS CHARACTERS MUST BE VIEWED, THE PROTECTIVE COVERING SHALL HAVE A NON-GLARE FINISH.

-703.7.13 BRIGHTNESS. THE BRIGHTNESS OF VARIABLE MESSAGE SIGNS IN EXTERIOR LOCATIONS SHALL AUTOMATICALLY ADJUST IN RESPONSE TO CHANGES IN AMBIENT -703.7.14 RATE OF CHANGE. WHERE A VMS MESSAGE CAN BE DISPLAYED IN ITS ENTIRETY ON A SINGLE SCREEN, IT SHALL BE DISPLAYED ON A SINGLE SCREEN AND SHALL REMAIN MOTIONLESS ON THE SCREEN FOR A MINIMUM 3 SECONDS OR ONE SECOND MINIMUM FOR EVERY 7 CHARACTERS OF THE MESSAGE INCLUDING SPACES WHICHEVER IS TABLE 703.7.5 - PIXEL COUNT FOR LOW **RESOLUTION VMS SIGNAGE\*** 

Rańge

2-3

2-3

3-5

3-5

3-5

Character Character Stroke Character

8-10

9-12

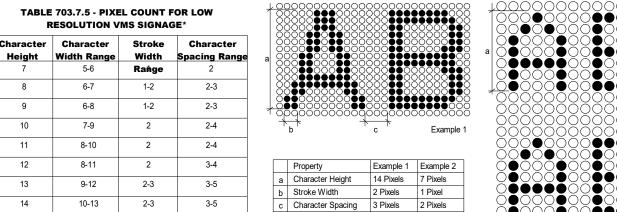
11-14

\* Measured in pixels

704 TELEPHONES

10-13 2-3

8-11



#### FIG. 703.7.5 **LOW RESOLUTION VMS SIGNAGE CHARACTER**

-703.8 REMOTE INFRARED AUDIBLE SIGN (RIAS) SYSTEMS. 703.8.1 GENERAL. REMOTE INFRARED AUDIBLE SIGN SYSTEMS SHALL COMPLY WITH SECTION 703.8. -703.8.2 TRANSMITTERS. WHERE PROVIDED, REMOTE INFRARED AUDIBLE SIGN TRANSMITTERS SHALL BE DESIGNED TO COMMUNICATE WITH RECEIVERS COMPLYING WITH SECTION 703.8.3.
-703.8.3 INFRARED AUDIBLE SIGN RECEIVERS.

d Line Spacing

-703.8.3.1 FREQUENCY. BASIC SPEECH MESSAGES SHALL BE FREQUENCY MODULATED AT 25 KHZ, WITH A +/- 2.5 KHZ DEVIATION, AND SHALL HAVE AN INFRARED WAVELENGTH FROM 850 TO 950 NANOMETER (NM). -703.8.3.2 OPTICAL POWER DENSITY. RECEIVER SHALL PRODUCE A 12 DECIBEL (DB) SIGNAL-PLUS-NOISE-TO-NOISE RATIO WITH A 1 KHZ MODULATION TONE AT +/- 2.5 KHZ DEVIATION OF THE 25 KHZ SUBCARRIER AT AN OPTICAL POWER DENSITY OF 26 PICOWATTS PER SQUARE MILLIMETER MEASURED AT THE RECEIVER PHOTOSENSOF -703.8.3.3 AUDIO OUTPUT. THE AUDIO OUTPUT FROM AN INTERNAL SPEAKER SHALL BE AT 75 DBA MINIMUM AT 18 INCHES (455 MM) WITH A MAXIMUM DISTORTION OF 10

-703.8.3.5 MULTIPLE SIGNALS. A RECEIVER PROVIDED FOR THE CAPTURE OF THE STRONGER OF TWO SIGNALS IN THE RECEIVER FIELD OF VIEW SHALL PROVIDE A RECEIVED POWER RATIO ON THE ORDER OF 20 DB FOR NEGLIGIBLE INTERFERENCE.

-703.9 PEDESTRIAN SIGNALS. ACCESSIBLE PEDESTRIAN SIGNALS SHALL COMPLY WITH SECTION 4E.06-ACCESSIBLE PEDESTRIAN SIGNALS, AND SECTION 4E.09-ACCESSIBLE PEDESTRIAN SIGNAL DETECTORS. OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES LISTED IN SECTION 105.2.1. EXCEPTION: PEDESTRIAN SIGNALS ARE NOT

-703.8.3.4 RECEPTION RANGE. THE RECEIVER SHALL BE DESIGNED FOR A HIGH DYNAMIC RANGE AND CAPABLE OF OPERATING IN FULL-SUN BACKGROUND

-704.1 GENERAL. ACCESSIBLE PUBLIC TELEPHONES SHALL COMPLY WITH SECTION 704. -704.2 WHEELCHAIR ACCESSIBLE TELEPHONES. WHEELCHAIR ACCESSIBLE PUBLIC TELEPHONES SHALL COMPLY WITH SECTION 704.2. EXCEPTION: DRIVE UP ONLY PUBLIC -704.2.1 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED. THE CLEAR FLOOR SPACE SHALL NOT BE OBSTRUCTED BY BASES, -704.2.1.1 PARALLEL APPROACH. WHERE A PARALLEL APPROACH IS PROVIDED, THE DISTANCE FROM THE EDGE OF THE TELEPHONE ENCLOSURE TO THE FACE OF THE TELEPHONE SHALL BE 10 INCHES (255 MM) MAXIMUM. -704.2.1.2 FORWARD APPROACH. WHERE A FORWARD APPROACH IS PROVIDED. THE DISTANCE FROM THE FRONT EDGE OF A COUNTER WITHIN THE ENCLOSURE TO THE FACE OF THE TELEPHONE SHALL BE 20 INCHES (510 MM) MAXIMUM.

ELEPHONES SHALL HAVE PUSH BUTTON CONTROLS WHERE SERVICE FOR SUCH EQUIPMENT FIG. 704.2.1 -704.2.3 TELEPHONE DIRECTORIES. WHERE PROVIDED, TELEPHONE DIRECTORIES SHALL CLEAR FLOOR SPACE FOR TELEPHONES COMPLY WITH SECTION 309. -704.2.4 CORD LENGTH. THE TELEPHONE HANDSET CORD SHALL BE 29 INCHES (735 MM) MINIMUM IN LENGTH.

-704.2.5 HEARING-AID COMPATIBILITY. TELEPHONES SHALL BE HEARING AID COMPATIBLE. -704.3 VOLUME-CONTROL TELEPHONES. PUBLIC TELEPHONES REQUIRED TO HAVE VOLUME CONTROLS SHALL BE EQUIPPED WITH A RECEIVER VOLUME CONTROL THAT PROVIDES A GAIN ADJUSTABLE UP TO 20 DB MINIMUM. INCREMENTAL VOLUME CONTROLS SHALL PROVIDE AT LEAST ONE INTERMEDIATE STEP OF GAIN OF 12 DB MINIMUM. AN AUTOMATIC RESET SHALL BE PROVIDED. -704.4 TTY. TIYS REQUIRED AT A PUBLIC PAY TELEPHONE SHALL BE PERMANENTLY AFFIXED WITHIN, OR ADJACENT TO, THE TELEPHONE ENCLOSURE. WHERE AN ACOUSTIC COUPLER IS USED, THE TELEPHONE CORD SHALL BE OF SUFFICIENT LENGTH TO ALLOW CONNECTION OF THE TIY AND THE TELEPHONE RECEIVER.

-704.5 HEIGHT. WHEN IN USE, THE TOUCH SURFACE OF TTY KEYPADS SHALL BE 34 INCHES (865 MM) MINIMUM ABOVE THE FLOOR. EXCEPTION: WHERE SEATS ARE PROVIDED, TTYS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 704.5.

-704.6 TTY SHELF. WHERE PUBLIC PAY TELEPHONES DESIGNED TO ACCOMMODATE A PORTABLE TTY ARE PROVIDED, THEY SHALL BE EQUIPPED WITH A SHELF AND AN ELECTRICAL OUTLET WITHIN OR ADJACENT TO THE TELEPHONE ENCLOSURE. THE TELEPHONE HANDSET SHALL BE CAPABLE OF BEING PLACED FLUSH ON THE SURFACE OF THE SHELF. THE SHELF SHALL BE CAPABLE OF ACCOMMODATING A TIY AND SHALL HAVE A VERTICAL CLEARANCE 6 INCHES (150 MM) MINIMUM IN HEIGHT ABOVE THE AREA

-704.7 PROTRUDING OBJECTS. TELEPHONES, ENCLOSURES, AND RELATED EQUIPMENT SHALL COMPLY WITH SECTION 307 705 DETECTABLE WARNINGS -705.1 GENERAL. DETECTABLE WARNING SURFACES SHALL COMPLY WITH SECTION 705. -705.2 STANDARDIZATION. DETECTABLE WARNING SURFACES SHALL BE STANDARD WITHIN A BUILDING. FACILITY. SITE. OR COMPLEX OF BUILDINGS. EXCEPTION: IN FACILITIES THAT HAVE BOTH INTERIOR AND EXTERIOR LOCATIONS, DETECTABLE WARNINGS IN EXTERIOR LOCATIONS SHALL NOT BE REQUIRED TO COM

705.3 CONTRAST. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. -705.4 INTERIOR LOCATIONS. DETECTABLE WARNING SURFACES IN INTERIOR LOCATIONS SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND. -705.5 TRUNCATED DOMES. DETECTABLE WARNING SURFACES SHALL HAVE TRUNCATED DOMES COMPLYING WITH SECTION 705.5.

MM) MINIMUM AND 1.4 INCH (36 MM) MAXIMUM, AND A TOP DIAMETER OF 50 PERCENT MINIMUM AND 65 PERCENT MAXIMUM OF THE BASE DIAMETER. 705.5.2 HEIGHT. TRUNCATED DOMES SHALL HAVE A HEIGHT OF 0.2 INCH (5.1 MM). 705.5.3 SPACING. TRUNCATED DOMES SHALL HAVE A CENTER-TO-CENTER SPACING 1.6 INCHES (41 MM) MINIMUM AND 2.4 INCHES (61 MM) MAXIMUM, AND A BASETO-BASE SPACING OF 0.6S INCH (16.5 MM) MINIMUM, MEASURED BETWEEN THE MOST -705.5.4 ALIGNMENT. TRUNCATED DOMES SHALL BE ALIGNED IN A SQUARE GRID -705 6 TRANSPORTATION PLATFORM FDGES DETECTABLE WARNING SURFACES AT OF THE PUBLIC USE AREAS OF THE PLATFORM. THE DETECTABLE WARNING

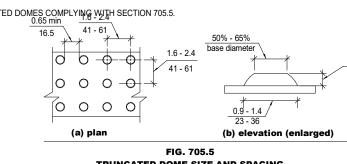
706 ASSISTIVE LISTENING SYSTEMS

HAVE A SINGLE RAISED DOT

1 | 2 | 3 |

-705.5.1 SIZE. TRUNCATED DOMES SHALL HAVE A BASE DIAMETER OF 0.9 INCH (23

-704.2.2 OPERABLE PARTS. OPERABLE PARTS SHALL COMPLY WITH SECTION 309.



(b) Forward Approach

TRUNCATED DOME SIZE AND SPACING

-706.1 GENERAL. ACCESSIBLE ASSISTIVE LISTENING SYSTEMS IN ASSEMBLY AREAS SHALL COMPLY WITH SECTION 706. -706.3 RECEIVER HEARING-AID COMPATIBILITY. RECEIVERS REQUIRED TO BE HEARING AID COMPATIBLE SHALL INTERFACE WITH TELECOILS IN HEARING AIDS THROUGH -706.4 SOUND PRESSURE LEVEL. ASSISTIVE LISTENING SYSTEMS SHALL BE CAPABLE OF PROVIDING A SOUND PRESSURE LEVEL OF 110 DB MINIMUM AND 118 DB -706.5 SIGNAL-TO-NOISE RATIO. THE SIGNAL-TO-NOISE RATIO FOR INTERNALLY GENERATED NOISE IN ASSISTIVE LISTENING SYSTEMS SHALL RF 18 DR MINIMI IM -706.6 PEAK CLIPPING LEVEL. PEAK CLIPPING SHALL NOT EXCEED 18 DB OF CLIPPING RELATIVE TO THE PEAKS OF SPEECH

707 AUTOMATIC TELLER MACHINES (ATMS) AND FARE MACHINES -707.1 GENERAL. ACCESSIBLE AUTOMATIC TELLER MACHINES AND FARE MACHINES SHALL COMPLY WITH SECTION 707.
-707.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED IN FRONT OF THE MACHINE. EXCEPTION: CLEARFLOOR SPACE IS NOT REQUIRED AT DRIVE UP ONLY AUTOMATIC TELLER MACHINES AND FARE MACHINES. -707.3 OPERABLE PARTS. OPERABLE PARTS SHALL COMPLY WITH SECTION 309. UNLESS A CLEAR OR CORRECT KEY IS PROVIDED, EACH OPERABLE PART SHALL BE ABLE TO BE DIFFERENTIATED BY SOUND OR TOUCH, WITHOUT ACTIVATION. **EXCEPTION**: DRIVE UP ONLY AUTOMATIC TELLER MACHINES AND FARE MACHINES SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 309.2 OR 309.3. -707.4 PRIVACY. AUTOMATIC TELLER MACHINES SHALL PROVIDE THE OPPORTUNITY FOR THE SAME DEGREE OF PRIVACY OF INPUT AND OUTPUT AVAILABLE TO ALL

-707.5 NUMERIC KEYS. NUMERIC KEYS SHALL BE ARRANGED IN A 12-KEY ASCENDING OR DESCENDING TELEPHONE KEYPAD LAYOUT. THE NUMBER FIVE KEY SHALL Table 707.6.1 - RAISED SYMBOLS

| 1     2     3    | 1    0    3           |                   |                                 |             |
|------------------|-----------------------|-------------------|---------------------------------|-------------|
| 4 5 6            | 4 5 6                 | Key function      | Description of<br>Raised Symbol | Raised Symb |
|                  | 1 2 2                 | Enter of Proceed: | CIRCLE                          | 0           |
| 7 8 9            | 1 2 3                 | Clear or Correct: | LEFT ARROW                      | -           |
| * 0 #            | * 0 #                 | Cancel:           | "X"                             | Х           |
|                  | U #                   | Add Value:        | PLUS SIGN                       | +           |
| 12-key ascending | (b) 12-key descending | Decreased Value:  | MINUS SIGN                      | _           |
| FIG. 1           |                       |                   | -                               | '           |

-705.6 TRANSPORTATION PLATFORM EDGES. DETECTABLE WARNING SURFACES AT TRANSPORTATION PLATFORM BOARDING EDGES SHALL EXTEND THE FULL LENGTH OF THE PUBLIC USE AREAS OF THE PLATFORM. THE DETECTABLE WARNING SURFACE SHALL EXTEND 24 INCHES (610 MM) FROM THE BOARDINGEDGE OF THE PLATFORM.

 - 706.1 GENERAL. ACCESSIBLE ASSISTIVE LISTENING SYSTEMS IN ASSEMBLY AREAS SHALL COMPLY WITH SECTION 706. -706.2 RECEIVER JACKS. RECEIVERS REQUIRED FOR USE WITH AN ASSISTIVE LISTENING SYSTEM SHALL INCLUDE A 1/8 INCH (3.2 MM) STANDARD MONO JACK. 706.3 RECEIVER HEARING-AID COMPATIBILITY. RECEIVERS REQUIRED TO BE HEARING AID COMPATIBLE SHALL INTERFACE WITH TELECOILS IN HEARING AIDS THROUGH THE PROVISION OF NECK LOOPS. -706.4 SOUND PRESSURE LEVEL. ASSISTIVE LISTENING SYSTEMS SHALL BE CAPABLE OF PROVIDING A SOUND PRESSURE LEVEL OF 110 DB MINIMUM AND 118 DB MAXIMUM, WITH A DYNAMIC RANGE ON THE VOLUME CONTROL OF 50 DB. -706.5 SIGNAL-TO-NOISE RATIO. THE SIGNAL-TO-NOISE RATIO FOR INTERNALLY GENERATED NOISE IN ASSISTIVE LISTENING SYSTEMS SHALL BE 18 DB MINIMUM.

-706.6 PEAK CLIPPING LEVEL. PEAK CLIPPING SHALL NOT EXCEED 18 DB OF CLIPPING RELATIVE TO THE PEAKS OF SPEECH.

707 AUTOMATIC TELLER MACHINES (ATMS) AND FARE MACHINES -707.1 GENERAL. ACCESSIBLE AUTOMATIC TELLER MACHINES AND FARE MACHINES SHALL COMPLY WITH SECTION 707 -707.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED IN FRONT OF THE MACHINE. EXCEPTION: CLEARFLOOR SPACE IS NOT REQUIRED AT DRIVE UP ONLY AUTOMATIC TELLER MACHINES AND FARE MACHINES -707,3 OPERABLE PARTS, OPERABLE PARTS SHALL COMPLY WITH SECTION 309, UNILESS A CLEAR OR CORRECT KEY IS PROVIDED. FACH OPERABLE PART SHALL RE ARI F TO RI DIFFERENTIATED BY SOUND OR TOUCH, WITHOUT ACTIVATION. EXCEPTION: DRIVE UP ONLY AUTOMATIC TELLER MACHINES AND FARE MACHINES SHALL NOT BE REQUIRED TO -707.4 PRIVACY, AUTOMATIC TELLER MACHINES SHALL PROVIDE THE OPPORTUNITY FOR THE SAME DEGREE OF PRIVACY OF INPUT AND OUTPUT AVAILABLE TO ALL INDIVIDUALS -707.5 NUMERIC KEYS. NUMERIC KEYS SHALL BE ARRANGED IN A 12-KEY ASCENDING OR DESCENDING TELEPHONE KEYPAD LAYOUT. THE NUMBER FIVE KEY SHALL HAVE A -707.6.2 CONTRAST. FUNCTION KEYS SHALL CONTRAST VISUALLY FROM BACKGROUND SURFACES. CHARACTERS AND SYMBOLS ON KEY SURFACES SHALL CONTRAST VISUALLY FROM KEY SURFACES. VISUAL CONTRAST SHALL BE EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. EXCEPTION: RAISED SYMBOLS REQUIRED BY SECTION 707.6.1 SHALL NOT BE

-707.7 DISPLAY SCREEN. THE DISPLAY SCREEN SHALL COMPLY WITH SECTION 707.7 -707.7.1 VISIBILITY. THE DISPLAY SCREEN SHALL BE VISIBLE FROM A POINT LOCATED 40 INCHES (1015 MM) ABOVE THE CENTER OF THE CLEAR FLOOR SPACE IN FRONT OF THE MACHINE. EXCEPTION: DRIVE UP ONLY AUTOMATIC TELLER MACHINES AND FARE MACHINES SHALL NOT BÉ REQUIRED TO COMPLY WITH SECTION 707.7.1 -707.7.2 CHARACTERS. CHARACTERS DISPLAYED ON THE SCREEN SHALL BE IN A SANS SERIF FONT. THE UPPERCASE LETTER "I" SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF THE FONT. THE UPPERCASE LETTER "I" OF THE FONT SHALL BE 3/16 INCH (4.8 MM) MINIMUM IN HEIGHT. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND, OR DARK CHARACTERS ON A LIGHT BACKGROUND. -707.8 SPEECH OUTPUT. MACHINES SHALL BE SPEECH ENABLED. OPERATING INSTRUCTIONS AND ORIENTATION, VISIBLE TRANSACTION PROMPTS, USER INPUT VERIFICATION, ERROR MESSAGES. AND ALL DISPLAYED INFORMATION FOR FULL USE SHALL BE ACCESSIBLE TO AND INDEPENDENTLY USABLE BY INDIVIDUALS WITH VISION IMPAIRMENTS. SPEECH SHALL BE DELIVERED THROUGH A MECHANISM THAT IS READILY AVAILABLE TO ALL USERS INCLUDING, BUT NOT LIMITED TO, AN INDUSTRY STANDARDCONNECTOR OR A TELEPHONE HANDSET, SPEECH SHALL BERECORDED OR DIGITIZED HUMAN, OR SYNTHESIZED, EXCEPTIONS: 1, AUDIBLE TONES SHALL BE PERMITTED IN LIEU OF SPEECH FO VISIBLE OUTPUT THAT IS NOT DISPLAYEDFOR SECURITY PURPOSES, INCLUDING BUT NOT LIMITED TO, ASTERISKS REPRESENTING PERSONAL IDENTIFICATION NUMBERS. 2. ADVERTISEMENTS AND OTHER SIMILAR INFORMATION SHALL NOT BE REQUIRED TO BE AUDIBLE UNLESS THEY CONVEY INFORMATION THAT CAN BE USED IN THE TRANSACTION BEING CONDUCTED. 3. WHERE SPEECH SYNTHESIS CANNOT BE SUPPORTED, DYNAMIC ALPHABETIC OUTPUT SHALL NOT BE REQUIRED TO BE AUDIBLE -707.8.1 USER CONTROL. SPEECH SHALL BE CAPABLE OF BEING REPEATED AND INTERRUPTED BY THE USER. THERESHALL BE A VOLUME CONTROL FOR THE SPEECH FUNCTION. EXCEPTION: SPEECH OUTPUT FOR ANY SINGLE FUNCTION SHALL BE PERMITTED TO BE AUTOMATICALLY INTERRUPTED WHEN A TRANSACTION IS SELECTED. -707.8.2 RECEIPTS. WHERE RECEIPTS ARE PROVIDED. SPEECH OUTPUT DEVICES SHALL PROVIDE AUDIBLE BALANCE INQUIRY INFORMATION. ERROR MESSAGES. AND ALL OTHER INFORMATION ON THE PRINTED RECEIPT NECESSARY TO COMPLETE OR VERIFY THE TRANSACTION. EXCEPTIONS: 1. MACHINE LOCATION, DATE AND TIME OF ANSACTION, CUSTOMER ACCOUNT NUMBER, AND THE MACHINE IDENTIFIER SHALL NOT BE REQUIRED TO BE AUDIBLE. 2. INFORMATION ON PRINTED RECEIPTS THAT DUPLICATES AUDIBLE INFORMATION AVAILABLE ONSCREEN SHALL NOT BE REQUIRED TO BE PRESENTED IN THE FORM OF AN AUDIBLE RECEIPT. 3. PRINTED COPIES OF BANK TEMENTS AND CHECKS SHALL NOT BE REQUIRED TO BE AUDIBLE.

-707.9 INPUT CONTROLS. AT LEAST ONE TACTUALLY DISCERNIBLE INPUT CONTROL SHALL BE PROVIDED FOR EACH FUNCTION. WHERE PROVIDED, KEY SURFACES NOT ON ACTIVE AREAS OF DISPLAY SCREENS SHALL BE RAISED ABOVE SURROUNDING SURFACES. WHERE MEMBRANE KEYS ARE THE ONLY METHOD OF INPUT, EACH SHALL BE CTUALLY DISCERNABLE FROM SURROUNDING SURFACES AND ADJACENT KEYS. 707.10 BRAILLE INSTRUCTIONS. BRAILLE INSTRUCTIONS FOR INITIATING THE SPEECH MODE SHALL BE PROVIDED. BRAILLE SHALL COMPLY WITH SECTION 703.4.

-708.1 GENERAL ACCESSIBLE TWO-WAY COMMUNICATION SYSTEMS SHALL COMPLY WITH SECTION 708 -708.2 AUDIBLE AND VISUAL INDICATORS. THE SYSTEM SHALL PROVIDE BOTH VISUAL AND AUDIBLE SIGNALS.

708 TWO-WAY COMMUNICATION SYSTEMS

-708.3 HANDSETS. HANDSET CORDS, IF PROVIDED, SHALL BE 29 INCHES (735 MM) MINIMUM IN LENGTH -708.4 TELEPHONE ENTRY SYSTEMS. TELEPHONE ENTRY SYSTEMS SHALL COMPLY WITH ANSI/DASMA 303 LISTED IN SECTION 105.2.7.

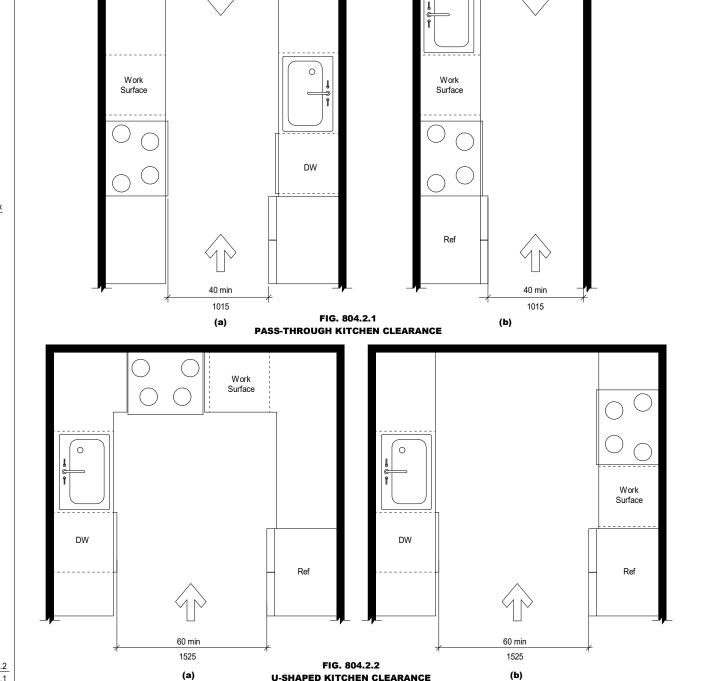
-801.1 SCOPE. SPECIAL ROOMS AND SPACES REQUIRED TO BE ACCESSIBLE BY THE SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL COMPLY WITH

803 DRESSING, FITTING, AND LOCKER ROOMS -803.1 GENERAL, ACCESSIBLE DRESSING, FITTING, AND LOCKER ROOMS SHALL COMPLY WITH SECTION 803

03.2 TURNING SPACE. A TURNING SPACE COMPLYING WITH SECTION 304 SHALL BE PROVIDED WITHIN THE ROOM -803.3 DOOR SWING. DOORS SHALL NOT SWING INTO THE ROOM UNLESS A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305.3 IS PROVIDED WITHIN THE ROOM. BEYOND -803.4 BENCHES. A BENCH COMPLYING WITH SECTION 903 SHALL BE PROVIDED WITHIN THE ROOM. -803.5 COAT HOOKS AND SHELVES. ACCESSIBLE COAT HOOKS PROVIDED WITHIN THE ROOM SHALL ACCOMMODATE A FORWARD REACH OR SIDE REACH COMPLYING WITH SECTION 308. WHERE PROVIDED, A SHELF SHALL BE 40 INCHES (1015 MM) MINIMUM AND 48 INCHES (1220 MM) MAXIMUM ABOVE THE FLOOR

804 KITCHENS AND KITCHENETTES -804.1 GENERAL. ACCESSIBLE KITCHENS AND KITCHENETTES SHALL COMPLY WITH SECTION 804. -804.2 CLEARANCE. WHERE A PASS-THROUGH KITCHEN IS PROVIDED, CLEARANCES SHALL COMPLY WITH SECTION 804.2.1. WHERE A U-SHAPED KITCHEN IS PROVIDED, CLEARANCES SHALL COMPLY WITH SECTION 804.2.2. EXCEPTION: SPACES THAT DO NOT PROVIDE A COOKTOP OR CONVENTIONAL RANGE SHALL NOT BE REQUIRED TO COMPLY

H SECTION 804.2 PROVIDED THERE IS A 40-INCH (10151 MM) MINIMUM CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COUNTER TOPS, APPLIANCES, OR WALLS -804.2.1 PASS-THROUGH KITCHENS. IN PASS-THROUGH KITCHENS WHERE COUNTERS, APPLIANCES OR CABINETS ARE ON TWO OPPOSING SIDES, OR WHERE COUNTERS, APPLIANCES OR CABINETS ARE OPPOSITE A PARALLEL WALL, CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COUNTER TOPS, APPLIANCES, OR WALLS WITHIN KITCHEN ORK AREAS SHALL BE 40 INCHES (1015 MM) MINIMUM. PASSTHROUGH KITCHENS SHALL HAVE TWO ENTRIES -804.2.2 U-SHAPED KITCHENS, IN KITCHENS ENCLOSED ON THREE CONTIGUOUS SIDES, CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COUNTERTOPS, APPLIANCES. OR WALLS WITHIN KITCHEN WORK AREAS SHALL BE 60 INCHES (1525 MM) MINIMUM



-804.3 WORK SURFACE. AT LEAST ONE WORK SURFACE SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 902. EXCEPTION: SPACES THAT DO NOT PROVIDE A COOKTOP OR CONVENTIONAL RANGE SHALL NOT BE REQUIRED TO PROVIDE AN ACCESSIBLE WORK SURFACE.

-804 5 APPLIANCES, WHERE PROVIDED KITCHEN APPLIANCES SHALL COMPLY WITH SECTION 804 5 304.5.1 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED AT EACH KITCHEN APPLIANCE. -804,5,2 OPERABLE PARTS, ALL APPLIANCE CONTROLS SHALL COMPLY WITH SECTION 309. EXCEPTIONS: 1, APPLIANCE DOORS AND DOOR LATCHING DEVICES SHALL NOT BE EQUIRED 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. -804.5.3 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.

-804.5.4 COOKTOP. COOKTOPS SHALL COMPLY WITH SECTION 804.5.4. -804.5.4.1 APPROACH. A CLEAR FLOOR SPACE, POSITIONED FOR A PARALLEL OR FORWARD APPROACH TO THE COOKTOP, SHALL BE PROVIDED. SHALL BE PROVIDED. THE UNDERSIDE OF THE COOKTOP SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PREVENT BURNS. ABRASIONS, OR ELECTRICAL SHOCK.

-804.5.4.4 CONTROLS. THE LOCATION OF CONTROLS SHALL NOT REQUIRE REACHING ACROSS BURNERS. -804.5.5 OVEN. OVENS SHALL COMPLY WITH SECTION 804.5.5 -804.5.5.1 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

-804.5.5.2 SIDE-HINGED DOOR OVENS. SIDE-HINGED DOOR OVENS SHALL HAVE A WORK SURFACE COMPLYING WITH SECTION 804.3 POSITIONED ADJACENT TO THE LATCH -804.5.5.3 BOTTOM-HINGED DOOR OVENS. BOTTOM HINGED DOOR OVENS SHALL HAVE A WORK SURFACE COMPLYING WITH SECTION 804.3 POSITIONED ADJACENT TO ONE -804.5.5.4 CONTROLS. THE LOCATION OF CONTROLS SHALL NOT REQUIRE REACHING ACROSS BURNERS. -804.5.6 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 (1370 MM) MAXIMUM ABOVE THE FLOOR WHEN THE SHELVES ARE INSTALLED AT THE MAXIMUM HEIGHTS POSSIBLE IN THE OMPARTMENT. 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 (610 MM) MAXIMUM FROM THE CENTERLINE OF THE APPLIANCE. CHAPTER 9. BUILT-IN FURNISHINGS AND EQUIPMENT

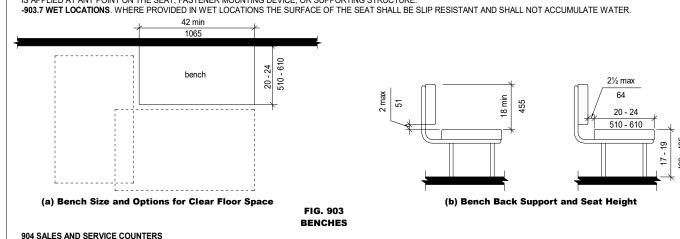
-901.1 SCOPE. BUILT-IN FURNISHINGS AND EQUIPMENT REQUIRED TO BE ACCESSIBLE BY THE SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF CHAPTER 9 902 DINING SURFACES AND WORK SURFACES

-902.1 GENERAL. ACCESSIBLE DINING SURFACES AND WORK SURFACES SHALL COMPLY WITH SECTION 902. EXCEPTION: DINING SURFACES AND WORK SURFACES PRIMARILY FOR CHILDREN'S USE SHALL BE PERMITTED TO COMPLY WITH SECTION 902.5.

-902.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR A FORWARD APPROACH, SHALL BE PROVIDED. KNEE AND TOE NCE COMPLYING WITH SECTION 306 SHALL BE PROVIDED. **EXCEPTIONS: 1.** AT DRINK SURFACES 12 INCHES (305 MM) OR LESS IN DEPTH, KNEE AND TOE SPACE SHAL NOT BE REQUIRED TO EXTEND BENEATH THE SURFACE BEYOND THE DEPTH OF THE DRINK SURFACE PROVIDED. 2. DINING SURFACES THAT ARE 15 INCHES (380 MM) MINIMUM AND 24 INCHES (610 MM) MAXIMUM IN HEIGHT ARE PERMITTED TO HAVE A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 PSITIONED FOR A PARALLEL APPROACH. -902.3 EXPOSED SURFACES. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER THE EXPOSED PORTIONS OF DINING SURFACES AND WORK SURFACES. -902.4 HEIGHT. THE TOPS OF DINING SURFACES AND WORK SURFACES SHALL BE 28 INCHES (710 MM) MINIMUM AND 34 INCHES (865 MM) MAXIMUM IN HEIGHT ABOVE THE

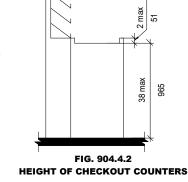
-902.5 DINING SURFACES AND WORK SURFACES FOR CHILDREN'S USE. ACCESSIBLE DINING SURFACES AND WORK SURFACES PRIMARILY FOR CHILDREN'S USE SHALL COMPLY WITH SECTION 902.5. EXCEPTION: DINING SURFACES AND WORK SURFACES USED PRIMARILY BY CHILDREN AGES 5 AND YOUNGER SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 902.5 WHERE A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 IS PROVIDED AND IS POSITIONED FOR A PARALLEL APPROACH. -902.5.1 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305. POSITIONED FOR FORWARD APPROACH. SHALL BE PROVIDED, KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 306 SHALL BE PROVIDED. EXCEPTION: A KNEE CLEARANCE OF 24 INCHES (610 MM) MINIMUM ABOVE THE FLOOR SHALL BE PERMITTED. -902.5.2 HEIGHT. THE TOPS OF TABLES AND COUNTERS SHALL BE 26 INCHES (660 MM) MINIMUM AND 30 INCHES (760 MM) MAXIMUM ABOVE THE FLOOR.

-903.1 GENERAL, ACCESSIBLE BENCHES SHALL COMPLY WITH SECTION 903. -903.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR PARALLEL APPROACH TO THE BENCH SEAT, SHALL BE PROVIDED. -903.3 SIZE, BENCHES SHALL HAVE SEATS 42 INCHES (1065 MM) MINIMUM IN LENGTH, AND 20 INCHES (510 MM) MINIMUM AND 24 INCHES (610 MM) MAXIMUM IN DEPTH. -903.4 BACK SUPPORT. THE BENCH SHALL PROVIDE FOR BACK SUPPORT OR SHALL BE AFFIXED TO A WALL. BACK SUPPORT SHALL BE 42 INCHES (1065 MM) MINIMUM IN LENGTH AND SHALL EXTEND FROM A POINT 2 INCHES (51 MM) MAXIMUM ABOVE THE SEAT SURFACE TO A POINT 18 INCHES (455 MM) MINIMUM ABOVE THE SEAT SURFACE. BACK SUPPORT SHALL BE 2 1/2 INCHES (64 MM) MAXIMUM FROM THE REAR EDGE OF THE SEAT MEASURED HORIZONTALLY. -903.5 HEIGHT. THE TOP OF THE BENCH SEAT SHALL BE 17 INCHES (430 MM) MINIMUM AND 19 INCHES (485 MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO THE TOP OF THE SEAT. EXCEPTION: BENCHES PRIMARILY FOR CHILDREN'S USE SHALL BE PERMITTED TO BE 11 INCHES (280 MM) MINIMUM AND 17 INCHES (430 MM) MAXIMUM ABOVE THE FLOOR, -993.6 STRUCTURAL STRENGTH. ALLOWABLE STRESSES SHALL NOT BE EXCEEDED FOR MATERIALS USED WHERE A VERTICAL OR HORIZONTAL FORCE OF 250 POUNDS (1112 N)



-904.1 GENERAL, ACCESSIBLE SALES AND SERVICE COUNTERS AND WINDOWS SHALL COMPLY WITH SECTION 904 AS APPLICABLE. **EXCEPTION:** DRIVE UP ONLY SALES OR SERVICE COUNTERS AND WINDOWS ARE NOT REQUIRED TO COMPLY WITH -904.2 APPROACH. ALL PORTIONS OF COUNTERS REQUIRED TO BE ACCESSIBLE SHALL BE LOCATED ADJACENT TO A WALKING SURFACE COMPLYING WITH SECTION 403 -904.3 SALES AND SERVICE COUNTERS. SALES AND SERVICE COUNTERS SHALL COMPLY WITH SECTION 904.3.1 OR 904.3.2. THE ACCESSIBLE PORTION OF THE COUNTERTOP SHALL EXTEND THE SAME DEPTH AS THE SALES AND SERVICE COUNTERTOP -904.3.1 PARALLEL APPROACH. A PORTION OF THE COUNTER SURFACE 36 INCHES (915 MM) MINIMUM IN LENGTH AND 36 INCHES (915 MM) MAXIMUM IN HEIGHT ABOVE THE FLOOR SHALL BE PROVIDED. WHERE THE COUNTER SURFACE IS LESS THAN 36 INCHES (915 MM) IN LENGTH, THE ENTIRE COUNTER SURFACE SHALL BE 36 INCHES (915 MM) MAXIMUM IN HEIGHT ABOVE THE FLOOR. À CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR A`PARALLEL APPROACH ADJACENT TO THE ACCESSIBLE COUNTER, SHALL BE PROVIDED. -904.3.2 FORWARD APPROACH. A PORTION OF THE COUNTER SURFACE 30 INCHES (760 MM) MINIMUM IN LENGTH AND 36 INCHES (915 MM) MAXIMUM IN HEIGHT ABOVE THE FLOOR SHALL BE PROVIDED. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR A FORWARD APPROACH TO THE ACCESSIBLE COUNTER, SHALL BE PROVIDED. KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 306 SHALL BE PROVIDED UNDER THE ACCESSIBLE COUNTER. -904.4 CHECKOUT AISLES. CHECKOUT AISLES SHALL COMPLY WITH SECTION 904.4.

-904.4.1 AISLE. AISLES SHALL COMPLY WITH SECTION 403. 104.4.2 COUNTERS. THE CHECKOUT COUNTER SURFACE SHALL BE 38 INCHES (965 MM) MAXIMUM IN HEIGHT ABOVE THE FLOOR. THE TOP OF THE COUNTER EDGE PROTECTION SHALL BE 2 INCHES (51 MM) MAXIMUM ABOVE THE TOP OF THE COUNTER -904.4.3 CHECK WRITING SURFACES. WHERE PROVIDED, CHECK WRITING SURFACES SHALL COMPLY WITH SECTION 902.4.



**Beach Channel Drive** 

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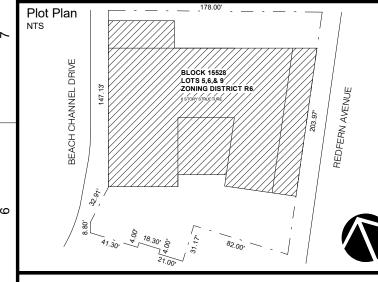
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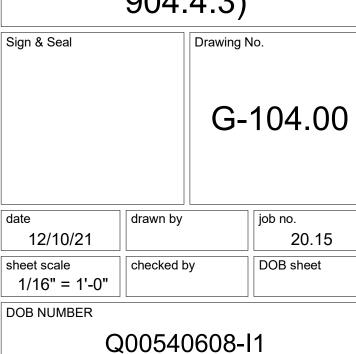
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ANSI GENERAL NOTES (CH. 609.4 -



-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 -1003.12 KITCHENS AND KITCHENETTES. KITCHENS AND KITCHENETTES SHALL COMPLY WITH SECTION 1003.12. -1004.11.3.1.2 WATER CLOSET. THE WATER CLOSET SHALL COMPLY WITH SECTION 1004.11.3.1.2. 904.5.1 SELF-SERVICE SHELVES AND DISPENSING DEVICES. SELF-SERVICE SHELVES AND DISPENSING DEVICES FOR TABLEWARE, DISHWARE, CONDIMENTS, FOOD AND -1003.12.1 CLEARANCE. CLEARANCE COMPLYING WITH SECTION 1003.12.1 SHALL BE PROVIDED -1004.11.3.1.2.1 LOCATION. THE CENTERLINE OF THE WATER CLOSET SHALL BE 16 INCHES (405 MM) MINIMUM AND 18 INCHES (455 MM) MAXIMUM FROM ONE SIDE OF THE REQUIRED BEVERAGES SHALL COMPLY WITH SECTION 308. -904.5.2 TRAY SLIDES. THE TOPS OF TRAY SLIDES SHALL BE 28 INCHES (710 MM) MINIMUM AND 34 INCHES (865 MM) MAXIMUM ABOVE THE FLOOR. -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 -1003.12.1.1 MINIMUM CLEARANCE. CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COUNTER TOPS, APPLIANCES, OR WALLS WITHIN KITCHEN WORK AREAS SHALL BE 40 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 -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 -904.6 SECURITY GLAZING. WHERE COUNTERS OR TELLER WINDOWS HAVE SECURITY GLAZING TO SEPARATE PERSONNEL FROM THE PUBLIC, A METHOD TO FACILITATE VOICE COMMUNICATION SHALL BE PROVIDED. TELEPHONE HANDSET DEVICES, IF PROVIDED, SHALL COMPLY WITH SECTION 704.3. **Beach Channel Drive** -1003.12.1.2 U-SHAPED KITCHENS. IN KITCHENS WITH COUNTERS, APPLIANCES, OR CABINETS ON THREE CONTIGUOUS SIDES, CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COMPLYING WITH SECTIONS 1003.11.2.4.2 THROUGH 1003.11.2.4.4. CENTERLINE OF THE CLEAR FLOOR SPACE SHALL BE OFFSET 24 INCHES (610 MM) 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. -1004.11.3.1.2.2.1 CLEARANCE WIDTH. CLEARANCE AROUND THE WATER CLOSET SHALL BE 48 INCHES (1220 MM) MINIMUM IN WIDTH, MEASURED PERPENDICULAR FROM THE SIDE OF THE CLEARANCE THAT IS 16 INCHES (405 MM) MINIMUM AND 18 INCHES (455 MM) MAXIMUM FROM THE WATER CLOSET CENTERLINE 905.1 GENERAL, ACCESSIBLE STORAGE FACILITIES SHALL COMPLY WITH SECTION 905. -1004.11.3.1.2.2.2 CLEARANCE DEPTH. CLEARANCE AROUND THE WATER CLOSET SHALL BE 56 INCHES (1420 MM) MINIMUM IN DEPTH, MEASURED PERPENDICULAR FROM THE REAR 13-12 Beach Channel Drive, Far 105.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED. -905.4 HEIGHT. ACCESSIBLE STORAGE ELEMENTS SHALL COMPLY WITH AT LEAST ONE OF THE REACH RANGES SPECIFIED IN SECTION 308.
-905.4 OPERABLE PARTS. OPERABLE PARTS OF STORAGE FACILITIES SHALL COMPLY WITH SECTION 309. 1005 TYPE C (VISITABLE) UNITS -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 (1675 MM) -1005.1 GENERAL. TYPE C (VISITABLE) DWELLING UNITS SHALL COMPLY WITH SECTION 1005. Rockaway, NY 11691 MINIMUM IN DEPTH. MEASURED PERPENDICULAR FROM THE REAR WALL 1005.2 UNIT ENTRANCE. AT LEAST ONE UNIT ENTRANCE SHALL BE ON A CIRCULATION PATH COMPLYING WITH SECTION 1005.5 FROM A PUBLIC STREET OR SIDEWALK, A CHAPTER 10. DWELLING UNITS AND SLEEPING UNITS 1004.11.3.1.2.2.4 CLEARANCE OVERLAP. A VANITY OR OTHER OBSTRUCTION 24 INCHES (610 MM) MAXIMUM IN DEPTH, MEASURED PERPENDICULAR FROM THE REAR WALL, SHALL BE DWELLING UNIT DRIVEWAY, OR A GARAGE. ERMITTED TO OVERLAP THE REQUIRED CLEARANCE, PROVIDED THE WIDTH OF THE REMAINING CLEARANCE AT THE WATER CLOSET IS 33 INCHES (840 MM) MINIMUM, 1005.3 CONNECTED SPACES. A CIRCULATION PATH COMPLYING WITH SECTION 1005.5 SHALL CONNECT THE UNIT ENTRANCE COMPLYING WITH SECTION 1005.2 AND WITH HE SPACES SPECIFIED IN SECTION 1005.4. -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 **BRC & CPG** 005.4 INTERIOR SPACES. THE ENTRANCE LEVEL SHALL INCLUDE A TOILET ROOM OR BATHROOM COMPLYING WITH SECTION 1005.6 AND ONE HABITABLE SPACE WITH AN OMMUNICATION FEATURES BY THE SCOPING PROVISIONS ADOPTED BY THE ADMINISTRATIVE AUTHORITY SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF CHAPTER 10. AREA 70 SQUARE FEET (6.5 M2.) MINIMUM, WHERE A FOOD PREPARATION AREA IS PROVIDED ON THE ENTRANCE LEVEL, IT SHALL COMPLY WITH SECTION 1005.7. 1005.5 CIRCULATION PATH, CIRCULATION PATHS SHALL COMPLY WITH SECTION 1005.5. 1002.2 PRIMARY ENTRANCE. THE ACCESSIBLE PRIMARY ENTRANCE SHALL BE ON AN ACCESSIBLE ROUTE FROM PUBLIC AND COMMON AREAS. THE PRIMARY ENTRANCE SHALL NOT -1005.5.1 COMPONENTS. THE CIRCULATION PATH SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING ELEMENTS: WALKING SURFACES WITH A SLOPE NOT STEEPER BE TO A BEDROOM UNLESS IT IS THE ONLY ENTRANCE. THAT 1:20, DOORS AND DOORWAYS, RAMPS, ELEVATORS COMPLYING WITH SECTIONS 407 THROUGH 409, AND WHEELCHAIR (PLATFORM) LIFTS COMPLYING WITH 1002.3 ACCESSIBLE ROUTE, ACCESSIBLE ROUTES WITHIN ACCESSIBLE UNITS SHALL COMPLY WITH SECTION 1002.3 -1002.3.1 LOCATION. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES AND ELEMENTS THAT ARE A PART OF THE UNIT. -1005.5.2 WALKING SURFACES, WALKING SURFACES WITH SLOPES NOT STEEPER THAN 1:20 SHALL COMPLY WITH SECTION 303 OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. EXCEPTION: AN ACCESSIBLE ROUTE IS NOT REQUIRED TO UNFINISHED ATTICS AND UNFINISHED -1005.5.2.1 CLEAR WIDTH. THE CLEAR WIDTH OF THE CIRCULATION PATH SHALL COMPLY WITH SECTION 403.5 BASEMENTS THAT ARE PART OF THE UNIT **-1005.5.3 DOORS AND DOORWAYS.** DOORS AND DOORWAYS SHALL COMPLY WITH SECTION 1005.5.3 -1002.3.2 TURNING SPACE. ALL ROOMS SERVED BY AN ACCESSIBLE ROUTE SHALL PROVIDE A TURNING SPACE COMPLYING WITH SECTION 304. EXCEPTIONS: 1. A TURNING SPACE -1005.5.3.1 CLEAR WIDTH. DOORWAYS SHALL HAVE A CLEAR OPENING OF 31 3/4 INCHES (805 MM) MINIMUM. CLEAR OPENING OF SWINGING DOORS SHALL BE SHALL NOT BE REQUIRED IN TOILET ROOMS AND BATHROOMS THAT ARE NOT REQUIRED TO COMPLY WITH SECTION 1002.11.2. 2. A TURNING SPACE IS NOT REQUIRED WITHIN MEASURED BETWEEN THE FACE OF THE DOOR AND STOP, WITH THE DOOR OPEN 90 DEGREES.

-1005.5.3.2 THRESHOLDS. THRESHOLDS SHALL COMPLY WITH SECTION 303. EXCEPTION: THRESHOLDS AT EXTERIOR SLIDING DOORS SHALL BE PERMITTED TO BE 3/4 clearance, wall, fixture LOSETS OR PANTRIES THAT ARE 48 INCHES (1220 MM) MAXIMUM IN DEPTH. -1002.3.3 COMPONENTS. ACCESSIBLE ROUTES SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING ELEMENTS: WALKING SURFACES WITH A SLOPE NOT STEEPER THAN 1:20 INCH (19 MM) MAXIMUM IN HEIGHT, PROVIDED THEY ARE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2. DOORS AND DOORWAYS, RAMPS, ELEVATORS, AND PLATFORM LIFTS. -1005.5.4 RAMPS, RAMPS SHALL COMPLY WITH SECTION 405. EXCEPTION: HANDRAILS, INTERMEDIATE LANDINGS AND EDGE PROTECTION ARE NOT REQUIRED WHERE -1002.4 WALKING SURFACES. WALKING SURFACES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH SECTION 403.
-1002.5 DOORS AND DOORWAYS. THE PRIMARY ENTRANCE DOOR TO THE UNIT, AND ALL OTHER DOORWAYS INTENDED FOR USER PASSAGE, SHALL COMPLY WITH SECTION 404. HE SIDES OF RAMP RUNS HAVE A VERTICAL DROP OFF OF 1/2 INCH (13 MM) MAXIMUM WITHIN 10 INCHES (255 MM) HORIZONTALLY OF THE RAMP RUN. -1005.5.4.1 CLEAR WIDTH, THE CLEAR WIDTH OF THE CIRCULATION PATH SHALL COMPLY WITH SECTION 403.5. EXCEPTIONS: 1. EXISTING DOORS TO HOSPITAL PATIENT SLEEPING ROOMS SHALL BE EXEMPT FROM THE REQUIREMENT FOR SPACE AT THE LATCH SIDE PROVIDED THE DOOR IS 44 -1005.6 TOILET ROOM OR BATHROOM. AT A MINIMUM, THE TOILET ROOM OR BATHROOM REQUIRED BY SECTION 1005.4 SHALL INCLUDE A LAVATORY AND A WATER INCHES (1120 MM) MINIMUM IN WIDTH. 2. IN TOILET ROOMS AND BATHROOMS NOT REQUIRED TO COMPLY WITH SECTION 1002.11.2, MANEUVERING CLEARANCES REQUIRED BY LOSET. REINFORCEMENT SHALL BE PROVIDED FOR THE FUTURE INSTALLATION OF GRAB BARS AT WATER CLOSETS. CLEARANCES AT THE WATER CLOSET SHALL 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 -1005.7 FOOD PREPARATION AREA. AT A MINIMUM, THE FOOD PREPARATION AREA SHALL INCLUDE A SINK, A COOKING APPLIANCE, AND A REFRIGERATOR. CLEARANCES 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 BETWEEN ALL OPPOSING BASE CABINETS, COUNTER TOPS, APPLIANCES OR WALLS WITHIN THE FOOD PREPARATION AREA SHALL BE 40 INCHES (1015 MM) MINIMUM IN THE REQUIRED MANEUVERING CLEARANCE, DOOR MANEUVERING CLEARANCE IS NOT REQUIRED ON THE EXTERIOR SIDE OF THE DOOR. WIDTH. EXCEPTION: SPACES THAT DO NOT PROVIDE A COOKTOP OR CONVENTIONAL RANGE SHALL BE PERMITTED TO PROVIDE A CLEARANCE OF 36 INCHES (915 MM) 1002.6 RAMPS. RAMPS SHALL COMPLY WITH SECTION 405. FIG. 1004.11.3.1.2 1002.7 FLEVATORS, FLEVATORS WITHIN THE UNIT SHALL COMPLY WITH SECTION 407, 408, OR 409. 40 min -1005.8 LIGHTING CONTROLS AND RECEPTACLE OUTLETS. RECEPTACLE OUTLETS AND OPERABLE PARTS OF LIGHTING CONTROLS SHALL BE LOCATED 15 INCHES (380 MM CLEARANCE AT WATER CLOSETS IN TYPE B UNITS 60 min 233 BROADWAY, SUITE 2150, NEW YORK, NY 10279 1002.8 PLATFORM LIFTS. PLATFORM LIFTS WITHIN THE UNIT SHALL COMPLY WITH SECTION 410. MINIMUM AND 48 INCHES (1220 MM) MAXIMUM ABOVE THE FLOOR. EXCEPTION: THE FOLLOWING SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 1005.8. 1. 1002.9 OPERABLE PARTS, LIGHTING CONTROLS, ELECTRICAL PANEL BOARDS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLIETS. ENVIRONMENTAL CONTROLS APPLIANCE -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 RECEPTACLE OUTLETS SERVING A DEDICATED USE. 2. CONTROLS MOUNTED ON CEILING FANS AND CEILING LIGHTS. 3. FLOOR RECEPTACLE OUTLETS. 4. LIGHTING T: 212/979/1510 E: post@uai-ny.com www.uai-ny.con CONTROLS, OPERATING HARDWARE FOR OPERABLE WINDOWS, PLUMBING FIXTURE CONTROLS, AND USER CONTROLS FOR SECURITY OR INTERCOM SYSTEMS SHALL COMPLY CONTROLS AND RECEPTACLE OUTLETS OVER COUNTERTOPS. 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 309. 3. FLOOR RECEPTACLE -1004 11.3.1.3.1 PARALLEL APPROACH BATHTURS. A CLEARANCE 60 INCHES (1525 MM) MINIMUM IN LENGTH AND 30 INCHES (760 MM) MINIMUM IN WIDTH SHALL BE PROVIDED IN FIG. 1003.12.1.1 FIG. 1003.12.1.2 FRONT OF BATHTUBS WITH A PARALLEL APPROACH. LAVATORIES COMPLYING WITH SECTION 606 SHALL BE PERMITTED IN THE CLÉARANCE. A LAVATORY COMPLYING WITH U-SHAPED KITCHEN CLEARANCE IN TYPE A UNITS Consultants MINIMUM KITCHEN CLEARANCE IN TYPE A UNITS 1006 UNITS WITH ACCESSIBLE COMMUNICATION FEATURES UTLETS. 4. HVAC DIFFUSERS. 5. CONTROLS MOUNTED ON CEILING FANS. 6. WHERE REDUNDANT CONTROLS OTHER THAN LIGHT SWITCHES ARE PROVIDE SECTION 1004.11.3.1.1 SHALL BE PERMITTED AT ONE END OF THE BATHTUB IF A CLEARANCE 48 INCHES (1220 MM) MINIMUM IN LENGTH AND 30 INCHES (760 MM) MINIMUM IN WIDTH IS 1006.1 GENERAL, UNITS REQUIRED TO HAVE ACCESSIBLE COMMUNICATION FEATURES SHALL COMPLY WITH SECTION 1006. ELEMENT. ONE CONTROL IN EACH SPACE SHALL NOT BE REQUIRED TO BE ACCESSIBLE. 7. RESET BUTTONS AND SHUT-OFFS SERVING APPLIANCES, PIPING AND PLUMBING -1003.12.2 CLEAR FLOOR SPACE. CLEAR FLOOR SPACES REQUIRED BY SECTIONS 1003.12.3 THROUGH 1003.12.5 SHALL COMPLY WITH SECTION 305. STRUCTURAL ENGINEER -1006.2 UNIT SMOKE DETECTION. WHERE PROVIDED, UNIT SMOKE DETECTION SHALL INCLUDE AUDIBLE NOTIFICATION COMPLYING WITH NFPA 72 LISTED IN SECTION FIXTURES. 8. ELECTRICAL PANELBOARDS SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 309.4.
-1002.10 LAUNDRY EQUIPMENT. WASHING MACHINES AND CLOTHES DRYERS SHALL COMPLY WITH SECTION 611. -1004.11.3.1.3.2 FORWARD APPROACH BATHTUBS. A CLEARANCE 60 INCHES (1525 MM) MINIMUM IN LENGTH AND 48 INCHES (1220 MM) MINIMUM IN WIDTH SHALL BE PROVIDED IN -1003.12.3 WORK SURFACE, AT LEAST ONE SECTION OF COUNTER SHALL PROVIDE A WORK SURFACE 30 INCHES (760 MM) MINIMUM IN LENGTH COMPLYING WITH SECTION 1003.12.3 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. -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 **GACE Consulting Engineers** -1006.3 BUILDING FIRE ALARM SYSTEM. WHERE A BUILDING FIRE ALARM SYSTEM IS PROVIDED, THE SYSTEM WIRING SHALL BE EXTENDED TO A POINT WITHIN THE UNIT -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 (915 1002.11 TOILET AND BATHING FACILITIES. AT LEAST ONE TOI LET AND BATHING FACILITY SHALL COMPLY WITH SECTION 1002.11.2. ALL OTHER TOILET AND BATHING FACILITIES SHALL OMPLYING WITH SECTION 306 SHALL BE PROVIDED. THE CLEAR FLOOR SPACE SHALL BE CENTERED ON THE WORK SURFACE. EXCEPTION: CABINETRY SHALL BE PERMITTED UNDER IN THE VICINITY OF THE UNIT SMOKE DETECTION SYSTEM. MM) MINIMUM IN WIDTH AND 36 INCHES (915 MM) MINIMUM IN DEPTH. A CLEARANCE OF 48 INCHES (1220 MM) MINIMUM IN LENGTH. MEASURED PERPENDICUL AR FROM THE SHOWER THE WORK SURFACE, PROVIDED THE FOLLOWING 1 CRITERIA ARE MET: (a) THE CABINETRY CAN BE REMOVED WITHOUT REMOVAL OR REPLACEMENT OF THE WORK SURFACE, (b) THE -1006.4 VISIBLE NOTIFICATION APPLIANCES. VISIBLE NOTIFICATION APPLIANCES, WHERE PROVIDED WITHIN THE UNIT AS PART OF THE UNIT SMOKE DETECTION SYSTEM HEAD WALL, AND 30 INCHES (760 MM) MINIMUM IN DEPTH, MEASURED FROM THE FACE OF THE SHOWER COMPARTMENT, SHALL BE PROVIDED. REINFORCING FOR A SHOWER SEAT -1002.11.1 GRAB BARS AND SHOWER SEAT REINFORCEMENT. AT FIXTURES IN TOILET AND BATHING FACILITIES NOT REQUIRED TO COMPLY WITH SECTION 1002.11.2, LOOR FINISH EXTENDS UNDER THE CABINETRY. AND (c) THE WALLS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED 105 Madison Avenue, Floor 6, New York, NY OR THE BUILDING FIRE ALARM SYSTEM. SHALL COMPLY WITH SECTION 1006.4. IS NOT REQUIRED IN SHOWER COMPARTMENTS LARGER THAN 36 INCHES (915 MM) IN WIDTH AND 36 INCHES (915 MM) IN DEPTH REINFORCEMENT IN ACCORDANCE WITH SECTION 1004.11.1 SHALL BE PROVIDED. EXCEPTION: REINFORCEMENT IS NOT REQUIRED WHERE TYPE B UNITS ARE NOT PROVIDED IN THE -1003.12.3.2 HEIGHT. THE WORK SURFACE SHALL BE 34 INCHES (865 MM) MAXIMUM ABOVE THE FLOOR. EXCEPTION: A COUNTER THAT IS ADJUSTABLE TO PROVIDE A WORK SURFACE -1006.4.1 APPLIANCES. VISIBLE NOTIFICATION APPLIANCES SHALL COMPLY WITH SECTION 702 AT VARIABLE HEIGHTS INCHES (735 MM) MINIMUM AND 36 INCHES (915 MM) 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. -1006.4.2 ACTIVATION. ALL VISIBLE NOTIFICATION APPLIANCES PROVIDED WITHIN THE UNIT FOR SMOKE DETECTION NOTIFICATION SHALL BE ACTIVATED UPON SMOKE DETECTION. ALL VISIBLE NOTIFICATION APPLIANCES PROVIDED WITHIN THE UNIT FOR BUILDING FIRE ALARM NOTIFICATION SHALL BE ACTIVATED UPON ACTIVATION OF -1002.11.2 ACCESSIBLE TOILET AND BATHING FACILITY. AT LEAST ONE TOILET AND BATHING FACILITY SHALL COMPLY WITH SECTION 603. AT LEAST ONE LAVATORY, ONE WATER CLOSET AND FITHER A BATHTUB OR SHOWER WITHIN THE LINIT SHALL COMPLY WITH SECTIONS 604 THROLIGH 610. THE ACCESSIBLE TOILET AND BATHING FIXTURES SHALL BE IN A -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 SECTION 1003.12.4. SINGLE TOILET/BATHING AREA, SUCH THAT TRAVEL BETWEEN FIXTURES DOES NOT REQUIRE TRAVEL THROUGH OTHER PARTS OF THE UNIT.

-1002.11.2.1 VANITY COUNTER TOP SPACE. IF VANITY COUNTER TOP SPACE IS PROVIDED IN DWELLING OR SLEEPING UNITS NOT REQUIRED TO BE ACCESSIBLE UNITS WITHIN THE HE BUILDING FIRE ALARM IN THE PORTION OF THE BUILDING CONTAINING THE UNIT. -1006.4.3 INTERCONNECTION. THE SAME VISIBLE NOTIFICATION APPLIANCES SHALL BE PERMITTED TO PROVIDE NOTIFICATION OF UNIT SMOKE DETECTION AND -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. Skyline Engineering SAME FACILITY, EQUIVALENT VANITY COUNTER TOP SPACE, IN TERMS OF SIZE AND PROXIMITY TO THE LAVATORY, SHALL ALSO BE PROVIDED IN ACCESSIBLE UNITS.

-1002.11.2.2 MIRRORS. MIRRORS ABOVE ACCESSIBLE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40 INCHES (1015 MM) MAXIMUM ABOVE THE -1006.4.4 PROHIBITED USE. VISIBLE NOTIFICATION APPLIANCES USED TO INDICATE UNIT SMOKE DETECTION OR BUILDING FIRE ALARM ACTIVATION SHALL NOT BE USED 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 FOR ANY OTHER PURPOSE WITHIN THE UNIT. 42 West 39th Street, Floor 10, NY 10018 EPLACEMENT OF THE SINK. (b) THE FLOOR FINISH EXTENDS UNDER THE CABINETRY. AND (c) THE WALLS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED. -1006.5 UNIT PRIMARY ENTRANCE. COMMUNICATION FEATURES SHALL BE PROVIDED AT THE UNIT PRIMARY ENTRANCE COMPLYING WITH SECTION 1006.5. -1002.12 KITCHENS AND KITCHENETTES, KITCHENS AND KITCHENETTES SHALL COMPLY WITH SECTION 804, AT LEAST ONE WORK SURFACE, 30 INCHES (760 MM) MINIMUM IN LENGTH -1003.12.4.2 HEIGHT. THE FRONT OF THE SINK SHALL BE 34 INCHES (865 MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO THE HIGHER OF THE RIM OR COUNTER SURFACE. -1006.5.1 NOTIFICATION. A HARD-WIRED ELECTRIC DOORBELL SHALL BE PROVIDED. A BUTTON OR SWITCH SHALL BE PROVIDED ON THE PUBLIC SIDE OF THE UNIT SHALL COMPLY WITH SECTION 902. EXCEPTION: SPACES THAT DO NOT PROVIDE A COOKTOP OR CONVENTIONAL RANGE SHALL NOT BE REQUIRED TO PROVIDE AN ACCESSIBLE EXCEPTION: A SINK AND COUNTER THAT IS ADJUSTABLE TO VARIABLE HEIGHTS 29 INCHES (735 MM) MINIMUM AND 36 INCHES (915 MM) MAXIMUM ABOVE THE FLOOR. OR THAT CAN BE PRIMARY ENTRANCE. ACTIVATION OF THE BUTTON OR SWITCH SHALL INITIATE AN AUDIBLE TONE WITHIN THE UNIT.

-1006.5.2 IDENTIFICATION. A MEANS FOR VISUALLY IDENTIFYING A VISITOR WITHOUT OPENING THE UNIT ENTRY DOOR SHALL BE PROVIDED. PEEPHOLES, WHERE CIVIL ENGINEER WORK SURFACE RELOCATED WITHIN THAT RANGE WITHOUT CUTTING THE COUNTER OR DAMAGING ADJACENT CABINETS, WALLS, DOORS AND STRUCTURAL ELEMENTS, PROVIDED ROUGH-IN 1002.13 WINDOWS. WINDOWS SHALL COMPLY WITH SECTION 1002.13. PLUMBING PERMITS CONNECTIONS OF SUPPLY AND DRAIN PIPES FOR SINKS MOUNTED AT THE HEIGHT OF 29 INCHES (735 MM), SHALL BE PERMITTEI -1002.13.1 NATURAL VENTILATION. OPERABLE WINDOWS REQUIRED TO PROVIDE NATURAL VENTILATION SHALL COMPLY WITH SECTIONS 309.2 AND 309.3.
-1002.13.2 EMERGENCY ESCAPE. OPERABLE WINDOWS REQUIRED TO PROVIDE AN EMERGENCY ESCAPE AND RESCUE OPENING SHALL COMPLY WITH SECTION 309.2. ISED SHALL PROVIDE A MINIMUM 180 DEGREE RANGE OF VIEW Krypton Engineering -1003.12.4.3 FAUCETS. FAUCETS SHALL COMPLY WITH SECTION 309. -1006.6 SITE, BUILDING, OR FLOOR ENTRANCE. WHERE A SYSTEM PERMITTING VOICE COMMUNICATION BETWEEN A VISITOR AND THE OCCUPANT OF THE UNIT IS -1003 12 44 EXPOSED PIPES AND SURFACES. WATER SUPPLY AND DRAIN PIPES UNDER SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT PROVIDED AT A LOCATION OTHER THAN THE UNIT ENTRY DOOR, THE SYSTEM SHALL COMPLY WITH SECTION 1006.6.

-1006.6.1 PUBLIC OR COMMON-USE INTERFACE. THE PUBLIC OR COMMON-USE SYSTEM INTERFACE SHALL INCLUDE THE CAPABILITY OF SUPPORTING VOICE AND TTY 1002.14 STORAGE FACILITIES. WHERE STORAGE FACILITIES ARE PROVIDED, AT LEAST ONE OF EACH TYPE SHALL COMPLY WITH SECTION 905. EXCEPTION: KITCHEN CABINETS THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINKS. 527 W 48th Street, Ground Floor, New York, NY SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 1002.14. COMMUNICATION WITH THE UNIT INTERFACE.
-1006.6.2 UNIT INTERFACE. THE UNIT SYSTEM INTERFACE SHALL INCLUDE A TELEPHONE JACK CAPABLE OF SUPPORTING VOICE AND TTY COMMUNICATION WITH THE 1002.15 BEDS. IN AT LEAST ONE SLEEPING AREA, A MINIMUM OF FIVE PERCENT, BUT NOT LESS THAN ONE BED SHALL COMPLY WITH SECTION 1002.15. -1002.15.1 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 SHALL BE PROVIDED ON BOTH SIDES OF THE BED. THE CLEAR FLOOR SPACE SHALL BE ) FOR PARALLEL APPROACH TO THE SIDE OF THE BED. **EXCEPTION**: WHERE A SINGLE CLEAR FLOOR SPACE COMPLYING WITH SECTION 305 POSITIONED FO -1006,7 CLOSED-CIRCUIT COMMUNICATION SYSTEMS. WHERE A CLOSED-CIRCUIT COMMUNICATION SYSTEM IS PROVIDED, THE PUBLIC OR COMMON-USE SYSTEM ANDSCAPE ARCHITECT APPROACH IS PROVIDED BETWEEN TWO BEDS. A CLEAR FLOOR SPACE SHALL NOT BE REQUIRED ON BOTH SIDES OF THE BED. INTERFACE SHALL COMPLY WITH SECTION 1006.6.1, AND THE UNIT SYSTEM INTERFACE IN UNITS REQUIRED TO HAVE ACCESSIBLE COMMUNICATION FEATURES SHALL -1002.15.2 BED FRAMES. AT LEAST ONE BED SHALL BE PROVIDED WITH AN OPEN BED FRAI Liz Farrell Landscape Architecture -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 COMMON AREAS. THE PRIMARY ENTRANCE SHALL NOT 523 6th Ave, Brooklyn, NY 11215 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. -1003.3.1 LOCATION. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ALL SPACES AND ELEMENTS THAT ARE A PART OF THE UNIT. ACCESSIBLE ROUTES SHALL COINCIDE WITH (a) 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 FIG. 1004.11.3.1.3.1 -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 CODE CONSULTANT PARALLEL APPROACH BATHTUB IN TYPE B UNITS - OPTION A BATHROOM 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 -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 William Vitacco Associates Ltd PANTRIES THAT ARE 48 INCHES (1220 MM) MAXIMUM IN DEPTH. \* 36 min. (915) if part of T-shaped turning space \* 36 min. (915) if part of T-shaped turning -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, AREA, SUCH THAT TRAVEL BETWEEN FIXTURES DOES NOT REQUIRE TRAVEL THROUGH OTHER PARTS OF THE UNIT. per Sections 304.3.2 and 1003.3.2 space per Sections 304.3.2 and 1003.3. -1004.11.3.2.1 LAVATORY. LAVATORIES SHALL COMPLY WITH SECTIONS 1004.11.3.1.1 AND 1004.11.3.2.1.1 DOORS AND DOORWAYS, RAMPS, ELEVATORS, AND PLATFORM LIFTS. FIG. 1003.12.3 FIG. 1003.12.4 299 Broadway, 5th Floor, New York, NY 10007 003.4 WALKING SURFACES. WALKING SURFACES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH SECTION 403. -1004.11.3.2.1.1 HEIGHT. THE FRONT OF THE LAVATORY SHALL BE 34 INCHES (865 MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO THE HIGHER OF THE RIM OR COUNTER WORK SURFACE IN KITCHEN FOR TYPE A UNITS KITCHEN SINK FOR TYPE A UNITS -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 3/4 INCH (19 MM) MAXIMUM IN HEIGHT, PROVIDED THEY ARE BEVELED WITH A SLOPE NOT -1004.11.3.2.2 WATER CLOSET. THE WATER CLOSET SHALL COMPLY WITH SECTION 1004.11.3.1.2. 1003.12.5 APPLIANCES. WHERE PROVIDED, KITCHEN APPLIANCES SHALL COMPLY WITH SECTION 1003.12.5. -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 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 -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 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. 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. -1004.11.3.2.3.1 BATHTUB. A CLEARANCE 48 INCHES (1220 MM) MINIMUM IN LENGTH MEASURED PERPENDICULAR FROM THE CONTROL END OF THE BATHTUB, AND 30 INCHES (760 Plot Plan I. 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 -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. MM) MINIMUM IN WIDTH SHALL BE PROVIDED IN FRONT OF BATHTUBS. 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. -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 CLEARANCE, DOOR MANEUVERING CLEARANCE IS NOT REQUIRED ON THE EXTERIOR SIDE OF THE DOOR. -1004.11.3.2.3.2 SHOWER COMPARTMENT. A SHOWER COMPARTMENT SHALL COMPLY WITH SECTION 1004.11.3.1.3.3. NOT OBSTRUCT THE CLEAR FLOOR SPACE FOR THE DISHWASHER OR AN ADJACENT SINK. 1003.6 RAMPS. RAMPS SHALL COMPLY WITH SECTION 405. -1003.12.5.4 COOKTOP. COOKTOPS SHALL COMPLY WITH SECTION 1003.12.5.4.
-1003.12.5.4.1 APPROACH. A CLEAR FLOOR SPACE, POSITIONED FOR A PARALLEL OR FORWARD APPROACH TO THE COOKTOP, SHALL BE PROVIDED. 003.7 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 PANEL BOARDS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS, ENVIRONMENTAL CONTROLS, APPLIANCE -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. BLOCK 15528 LOTS 5,6,& 9'///// ZONING DISTRICT R6/ 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 -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 ENGTH 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 -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. RECEPTACLE OUTLETS. 4. HVAC DIFFUSERS. 5. CONTROLS MOUNTED ON CEILING FANS. 6. WHERE REDUNDANT CONTROLS OTHER THAN LIGHT SWITCHES ARE PROVIDED FOR A NGLE ELEMENT, ONE CONTROL IN EACH SPACE SHALL NOT BE REQUIRED TO BE ACCESSIBLE. 7. RESET BUTTONS AND SHUT-OFFS SERVING APPLIANCES, PIPING AND PLUMBING -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 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. -1003.12.5.5.2 SIDE-HINGED DOOR OVENS. SIDEHINGED DOOR OVENS SHALL HAVE A COUNTERTOP POSITIONED ADJACENT TO THE LATCH SIDE OF THE OVEN DOOR. 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 -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. 003.12.5.5.4 CONTROLS. THE LOCATION OF CONTROLS SHALL NOT REQUIRE REACHING ACROSS BURNER -1003.11.1 GRAB BAR AND SHOWER SEAT REINFORCEMENT. REINFORCEMENT SHALL BE PROVIDED FOR THE FUTURE INSTALLATION OF GRAB BARS COMPLYING WITH SECTION NATOR/FREEZER. COMBINATION REFRIGERATORS AND FREEZERS SHALL HAVE AT LEAST 50 PERCENT OF THE FREEZER COMPARTMENT SHELVES, INCLUDING 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, THE BOTTOM OF THE FREEZER 54 INCHES (1370 MM) MAXIMUM ABOVE THE FLOOR WHEN THE SHELVES ARE INSTALLED AT THE MAXIMUM HEIGHTS POSSIBLE IN THE COMPARTMENT. 08.2.2.3 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 OFFSET 24 INCHES (610 MM) MAXIMUM FROM THE CENTERLINE OF THE APPLIANCE 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 -1003.13.1 NATURAL VENTILATION. OPERABLE WINDOWS REQUIRED TO PROVIDE NATURAL VENTILATION SHALL COMPLY WITH SECTIONS 309.2 AND 309.3. ECTION 1003.11.2.4.4 REINFORCEMENT AT THE WATER CLOSET REAR WALL FOR A 24-INCH (610 MM) MINIMUM LENGTH GRAB BAR, CENTERED ON THE WATER CLOSET, SHALL BE 003.13.2 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 1003.11.2 GENERAL. AT LEAST ONE TOILET AND BATHING FACILITY SHALL COMPLY WITH SECTION 1003.11.2. AT LEAST ONE LAVATORY, ONE WATER CLOSET AND EITHER A BATHTUB NOT BE REQUIRED TO COMPLY WITH SECTION 1003.14 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. 1004 TYPE B UNITS FIG. 1004.11.3.2.3.1 -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. For Department of Buildings Use -1004.1 GENERAL. TYPE B UNITS SHALL COMPLY WITH SECTION 1004. FIG. 1004.11.3.1.3.3 FIG. 1004.11.3.2.1 BATHROOM CLEARANCE IN TYPE I -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 1003.11.2.2 LAVATORY, LAVATORIES SHALL COMPLY WITH SECTION 606. EXCEPTION: CABINETRY SHALL BE PERMITTED LINDER THE LAVATORY PROVIDED THE FOLLOWING CRITERIA TRANSFER-TYPE SHOWER **LAVATORY IN TYPE B UNITS - OPTION B BATHROOMS** 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 COMPARTMENT IN TYPE B UNITS **UNITS - OPTION E** -1004.3 ACCESSIBLE ROUTE. ACCESSIBLE ROUTES WITHIN TYPE B UNITS SHALL COMPLY WITH SECTION 1004.3. VALUS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED. 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 1003.11.2.3 MIRRORS. MIRRORS ABOVE ACCESSIBLE LAVATORIES SHALL HAVE THE BOTTOM EDGE OF THE REFLECTING SURFACE 40 INCHES (1015 MM) MAXIMUM ABOVE THE FLOOR. RE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. EXCEPTIONS: 1. AN ACCESSIBLE ROUTE IS NOT REQUIRED TO UNFINISHED ATTICS AND UNFINISHED BASEMENTS -1004.12 KITCHENS AND KITCHENETTES. KITCHENS AND KITCHENETTES SHALL COMPLY WITH SECTION 1004.12. 1003.11.2.4 WATER CLOSET. WATER CLOSETS SHALL COMPLY WITH SECTION 1003.11.2.4. 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 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 -1004.12.1 CLEARANCE. CLEARANCE COMPLYING WITH SECTION 1004.12.1 SHALL BE PROVIDED. 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 -1004.12.1.1 MINIMUM CLEARANCE. CLEARANCE BETWEEN ALL OPPOSING BASE CABINETS, COUNTER TOPS, APPLIANCES, OR WALLS WITHIN KITCHEN WORK AREAS SHALL BE 40 405 MM) MINIMUM AND 18 INCHES (455 MM) MAXIMUM FROM THE SIDEWALL 1003.11.2.4.2 CLEARANCE WIDTH, CLEARANCE ARQUIND THE WATER CLOSET SHALL BE 60 INCHES (1525 MM) MINIMUM IN WIDTH, MEASURED PERPENDICULAR FROM THE SIDE WALL -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 -1004.12.1.2 U-SHAPED KITCHENS. IN KITCHENS WITH COUNTERS, APPLIANCES, OR CABINETS ON THREE CONTIGUOUS SIDES, CLEARANCE BETWEEN ALL OPPOSING BASE 003.11.2.4.3 CLEARANCE DEPTH. CLEARANCE AROUND THE WATER CLOSET SHALL BE 56 INCHES (1420 MM) MINIMUM IN DEPTH, MEASURED PERPENDICULAR FROM THE REAR AND DOORWAYS, RAMPS, ELEVATORS, AND PLATFORM LIFTS. ABINETS, COUNTERTOPS, APPLIANCES, OR WALLS WITHIN KITCHEN WORK AREAS SHALL BE 60 INCHES (1525 MM) MINIMUM 1004.4 WALKING SURFACES. WALKING SURFACES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH SECTION 1004.4. 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 -1004.4.1 CLEAR WIDTH. CLEAR WIDTH OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH SECTION 403.5 PAPER DISPENSERS, COAT HOOKS, SHELVES, ACCESSIBLE ROUTES, CLEAR FLOOR SPACE REQUIRED AT OTHER FIXTURES, AND THE WHEELCHAIR TURNING SPACE, NO OTHER 04.4.2 CHANGES IN LEVEL. CHANGES IN LEVEL SHALL COMPLY WITH SECTION 303. EXCEPTION: WHERE EXTERIOR DECK, PATIO OR BALCONY SURFACE MATERIALS ARE IMPERVIOUS, IXTURES OR OBSTRUCTIONS SHALL BE LOCATED WITHIN THE REQUIRED WATER CLOSET CLEARANCE. EXCEPTION: A LAVATORY MEASURING 24 INCHES (610 MM) MAXIMUM IN THE FINISHED EXTERIOR IMPERVIOUS SURFACE SHALL BE 4 INCHES (100 MM) MAXIMUM BELOW THE FLOOR LEVEL OF THE ADJACENT INTERIOR SPACES OF THE UNIT. SEPTH AND COMPLYING WITH SECTION 1003 11.2.2 SHALL BE PERMITTED ON THE REAR WALL 18 INCHES (455 MM) MINIMUM FROM THE CENTERLINE OF THE WATER CLOSET TO THE -1004.5 DOORS AND DOORWAYS. DOORS AND DOORWAYS SHALL COMPLY WITH SECTION 1004.5. SIDE EDGE OF THE LAVATORY WHERE THE CLEARANCE AT THE WATER CLOSET IS 66 INCHES (1675 MM) MINIMUM MEASURED PERPENDICULAR FROM THE REAR WALL Issuance Schedule -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 -1003.11.2.4.5 HEIGHT. THE TOP OF THE WATER CLOSET SEAT SHALL BE 15 INCHES (380 MM) MINIMUM AND 19 INCHES (485 MM) MAXIMUM ABOVE THE FLOOR, MEASURED TO THE ELLING 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. -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 Description -1004.5.2.1 CLEAR WIDTH. DOORWAYS SHALL HAVE A CLEAR OPENING OF 31 3/4 INCHES (805 MM) MINIMUM. CLEAR OPENING OF SWINGING DOORS SHALL BE MEASURED BETWEEN THE OPERATED FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET FACE OF THE DOOR AND STOP, WITH THE DOOR OPEN 90 DEGREES. 1.1 | 06/14/21 | DOB PROGRESS SET -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 (1220 MM) OR LESS IHAN 15 INCHES (380 MM) 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 (19 MM) 1.2 | 06/28/21 | ISSUED FOR FILING 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. 1.3 | 08/24/21 | HPD BLDS SUBMISSION -1004.6 RAMPS. RAMPS SHALL COMPLY WITH SECTION 405. -1004.7 ELEVATORS, ELEVATORS WITHIN THE UNIT SHALL COMPLY WITH SECTION 407, 408, OR 409. 08/13/21 | 50% CD 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 10/29/21 90% CD 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 MOR 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 3.1 | 11/08/21 | HPD BLDS SUBMISSION 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 4 | 12/10/21 | 100% CD BATHROOMS, LIGHTING CONTROLS, ELECTRICAL SWITCHES AND RECEPTACLE OUTLETS ARE PERMITTED TO BE LOCATED OVER CABINETS WITH COUNTER TOPS 36 INCHES (915 MM) MAXIMUM IN HEIGHT AND 25 1/2 INCHES (650 MM) MAXIMUM IN DEPTH -1004.10 LAUNDRY EQUIPMENT. WASHING MACHÍNES 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 Ref ACHINE. A FORWARD OR PARALLEL APPROACH SHALL BE PROVIDED FOR A FRONT LOADING MACHIN 40 min ANSI GENERAL **-1004.11 TOILET AND BATHING FACILITIES**. TOILET AND BATHING FIXTURES SHALL COMPLY WITH SECTION 1004.11 1015 (d) Water Closet Seat (c) Clearance with Lavatory FIG. 1003.11.2.4 -1004.11.1 GRAB BAR AND SHOWER SEAT REINFORCEMENT. REINFORCEMENT SHALL BE PROVIDED FOR THE FUTURE NSTALLATION OF GRAB BARS AND SHOWER SEATS AT WATER CLOSETS, BATHTUBS, AND SHOWER COMPARTMENTS **WATER CLOSETS IN TYPE A UNITS** + FIG. 1004.12.1.1 WHERE WALLS ARE LOCATED TO PERMIT THE INSTALLATION OF GRAB BARS AND SEATS COMPLYING WITH SECTION NOTES (CH. 904.5 --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 604.5 AT WATER CLOSETS; GRAB BARS COMPLYING WITH SECTION 607.4 AT BATHTUBS; AND FOR GRAB BARS AND MINIMUM KITCHEN CLEARANCE IN TYPE B UNITS HOWER SEATS COMPLYING WITH SECTIONS, 608.3, 608.2.1.3, 608.2.2.3 AND 608.2.3.2 AT SHOWER COMPARTMENTS -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 EINFORCEMENT SHALL BE PROVIDED FOR THE FUTURE INSTALLATION OF GRAB BARS AND SEATS COMPLYING WITH 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 THOSE REQUIREMENTS. **EXCEPTIONS: 1**. IN A ROOM CONTAINING ONLY A LAVATORY AND A WATER CLOSET. REMOVED; (b) THE FLOOR FINISH EXTENDS UNDER THE COUNTERTOP AND CABINETRY; AND (c) THE WALLS BEHIND AND SURROUNDING THE COUNTERTOP AND CABINETRY ARE 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 -1003.11.2.5.2 SHOWER. SHOWERS SHALL COMPLY WITH SECTION 608. EXCEPTION: AT STANDARD ROLL-IN SHOWER COMPARTMENTS COMPLYING WITH SECTION 608.2.. /ERTICAL GRAB BAR COMPONENT REQUIRED BY SECTION 604.5 IS NOT REQUIRED. 3. AT WATER CLOSETS WHERE 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 I COUNTERTOP AND CABINETRY; AND (c) THE WALLS BEHIND AND SURROUNDING THE COUNTERTOP WALL SPACE WILL NOT PERMIT A GRAB BAR COMPLYING WITH SECTION 604.5.2. REINFORCEMENT FOR A REAR WAL GRAB BAR 24 INCHES (610 MM) MINIMUM IN LENGTH CENTERED ON THE WATER CLOSET SHALL BE PROVIDED. 4. AT Sign & Seal WATER CLOSETS WHÈRE A SÍDE WALL IS NOT AVAILABLE FOR A 42-INCH (1065 MM) GRAB BAR COMPLYING WITH SECTION 604.5.1, REINFORCEMENT FOR A SIDEWALL GRAB BAR, 24 INCHES (610 MM) MINIMUM IN LENGTH, LOCATED 12 INCHES (305 MM) MAXIMUM FROM THE REAR WALL, SHALL BE PROVIDED. **5**. AT WATER CLOSETS WHERE A SIDE WAL IS NOT AVAILABLE FOR A 42-INCH (1065 MM) GRAB BAR 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 (1065 MM) GRAB BAR COMPLYING WITH SECTION 604.5.1 G-105.00 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 (1065 MM) GRAB BAR COMPLYING WITH SWING-UP GRAB BAR FOR WATER CLOSE PERMITTED TO BE INSTALLED IN LIEU OF REINFORCEMENT FOR REAR WALL AND SIDE WALL GRAB BARS. 7. IN SHOWER COMPARTMENTS LARGER THAN 36 INCHES (915 MM) IN WIDTH AND 36 INCHES (915 MM) IN DEPTH REINFORCEMENT FOR A SHOWER SEAT IS NOT REQUIRED -1004.11.1.1 SWING-UP GRAB BARS. A CLEARANCE OF 18 INCHES (455 MM) MINIMUM FROM THE CENTERLINE OF THE WATER CLOSET TO ANY SIDE WALL OR OBSTRUCTION SHALL BE PROVIDED WHERE REINFORCEMENT FOR SWINGUP GRAB BARS IS PROVIDED. WHEN THE APPROACH TO THE WATER CLOSET IS FROM THE SIDE. THE 18 INCHES (455 MM) MINIMUM SHALL BE ON THE SIDE OPPOSITE THE DIRECTION OF APPROACH. REINFORCEMENT SHALL ACCOMMODATE A SWING-UP GRAB BAR CENTERED 15 3/4 INCHES (400 MM) FROM THE CENTERLINE OF THE WATER CLOSET AND 28 INCHES (710 MM) MINIMUM IN LENGTH. MEASURED 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 (840 MM) MINIMUM AND 36 INCHES (915 MM) MAXI job no. REINFORCEMENT SHALL BE ADEQUATE TO RESIST FORCES IN ACCORDANCE WITH SECTION 609.8. EXCEPTION: WHERE A WATER CLOSET IS POSITIONED WITH A WALL TO THE REAR AND TO ONE SIDE, THE CENTERLINE OF THE WATER CLOSET SHALL BE 16 INCHES (405 MM) MINIMUM AND 18 INCHES (455 MM) MAXIMUM FROM THE SIDEWAL 20.15 -1004.11.2 CLEAR FLOOR SPACE. CLEAR FLOOR SPACES REQUIRED BY SECTION 1004.11.3.1 (OPTION A) OR 1004.11.3.2 (OPTION 8) 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 FIG. 1004.12.1.2 DOB sheet SECTION 305.3. EXCLUDING KNEE AND TOE CLEARANCES LINDER ELEMENTS. IS PROVIDED WITHIN THE ROOM REYOND THE ARC OF THE DOOR SWING sheet scale 1004.11.2.2 KNEE AND TOE CLEARANCE. CLEAR FLOOR SPACE AT FIXTURES SHALL BE PERMITTED TO INCLUDE KNEE AND TOE CLEARANCES COMPL U-SHAPED KITCHEN CLEARANCE IN TYPE B UNITS 1/16" = 1'-0" -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

-1004.12.2 CLEAR FLOOR SPACE, CLEAR FLOOR SPACE AT APPLIANCES SHALL COMPLY WITH SECTIONS 1004.12.2 AND 305.3

THE SINK BOWL. **EXCEPTION:** A SINK WITH A FORWARD APPROACH COMPLYING WITH SECTION 1003.12.4.1.

DOOR IN THE OPEN POSITION SHALL NOT OBSTRUCT THE CLEAR FLOOR SPACE FOR THE DISHWASHER.

-1004.12.2.3 COOKTOP. COOKTOPS SHALL COMPLY WITH SECTION 1004.12.2.3.

-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

-1004.12.2.2 DISHWASHER. A CLEAR FLOOR SPACE, POSITIONED FOR A PARALLEL OR FORWARD APPROACH TO THE DISHWASHER, SHALL BE PROVIDED. THE DISHWASHER

-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 OF OTHERWISE CONFIGURED TO PREVENT BURNS, ABRASIONED OR ELECTRICAL SHOCK.

-1004 12 2 3 1 APPROACH A CLEAR ELOOR SPACE POSITIONED FOR A PARALLEL OR FORWARD APPROACH TO THE COOKTOP SHALL BE PROVIDED

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SHALL COMPLY WITH SECTION 1004.11 .3.2 (OPTION B).

THE ONLY LAVATORY OR WATER CLOSET ON THE ACCESSIBLE LEVEL OF THE UNIT.

60 min

Note: Layatory permitted per Section 608.2.2

FIG. 1003.11.2.5.2

TANDARD ROLL-IN-TYPE SHOWE

COMPARTMENT IN TYPE A UNITS

(a) without permanent

FIG. 1003.11.2.5.1

CLEARANCE FOR BATHTUBS IN TYPE A UNITS

-1004 11.3.1 OPTION A. FACH EXTURE PROVIDED SHALL COMPLY WITH SECTION 1004 11.3.1 EXCEPTIONS: 1. WHERE MULTIPLE LAVATORIES ARE PROVIDED IN A SINGLE TOILET AND

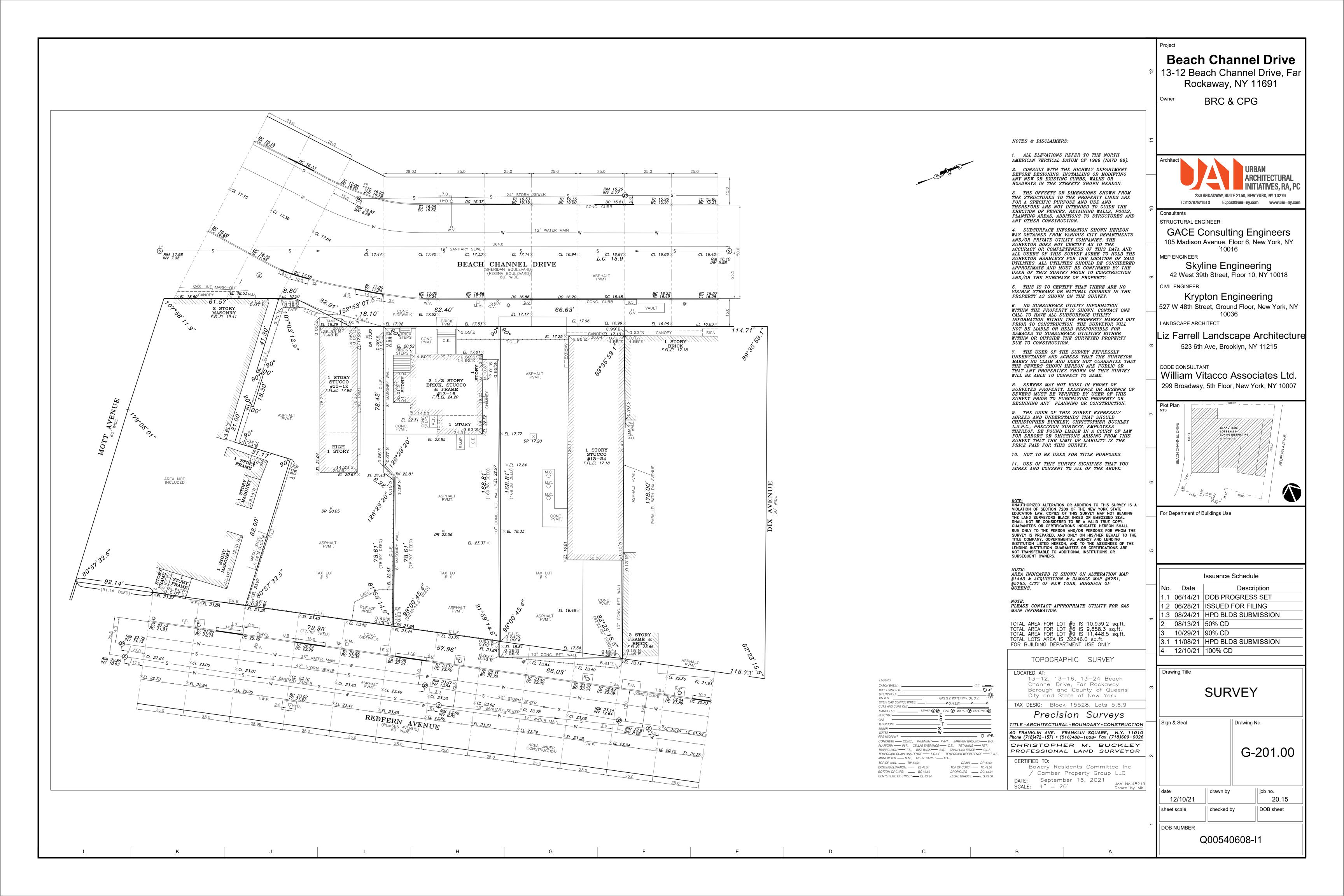
COMPLY WITH SECTION 1004.11.3.1. 2. A LAVATORY AND A WATER CLOSET IN A ROOM CONTAINING ONLY A LAVATORY AND WATER CLOSET, PROVIDED THE ROOM DOES NOT CONTAIN

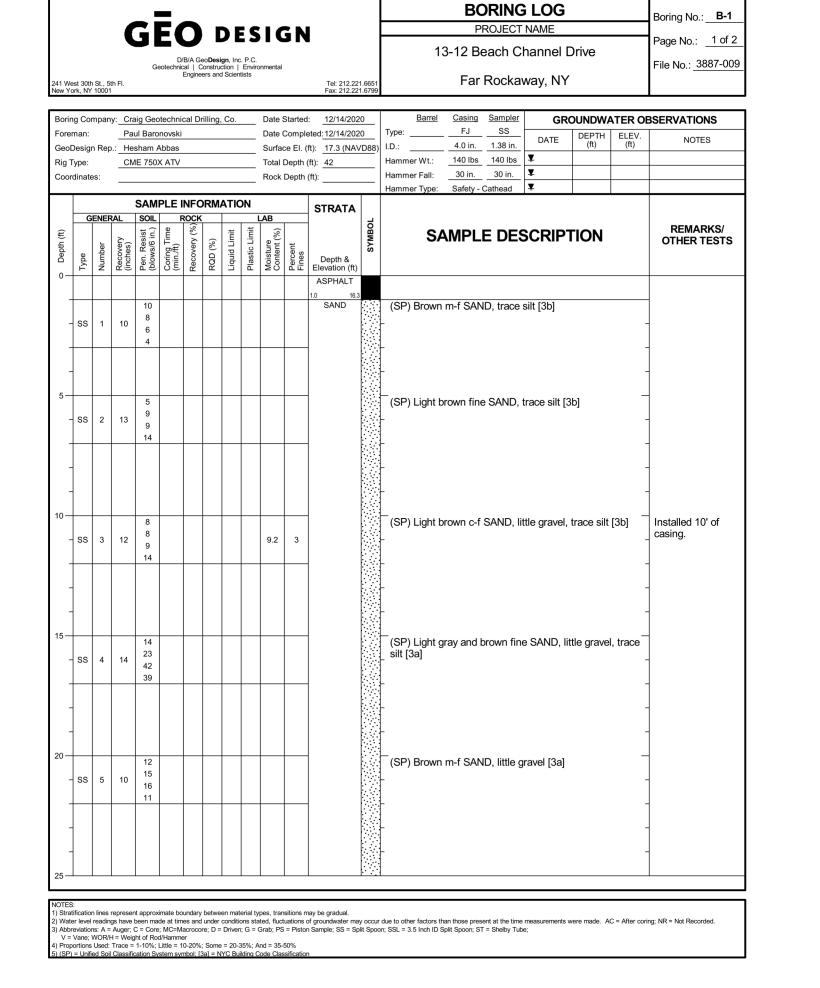
1004.11.3.1.1 LAVATORY. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305.3, POSITIONED FOR A PARALLEL APPROACH, SHALL BE PROVIDED AT A LAVATORY. THE CLEAR FLOOR

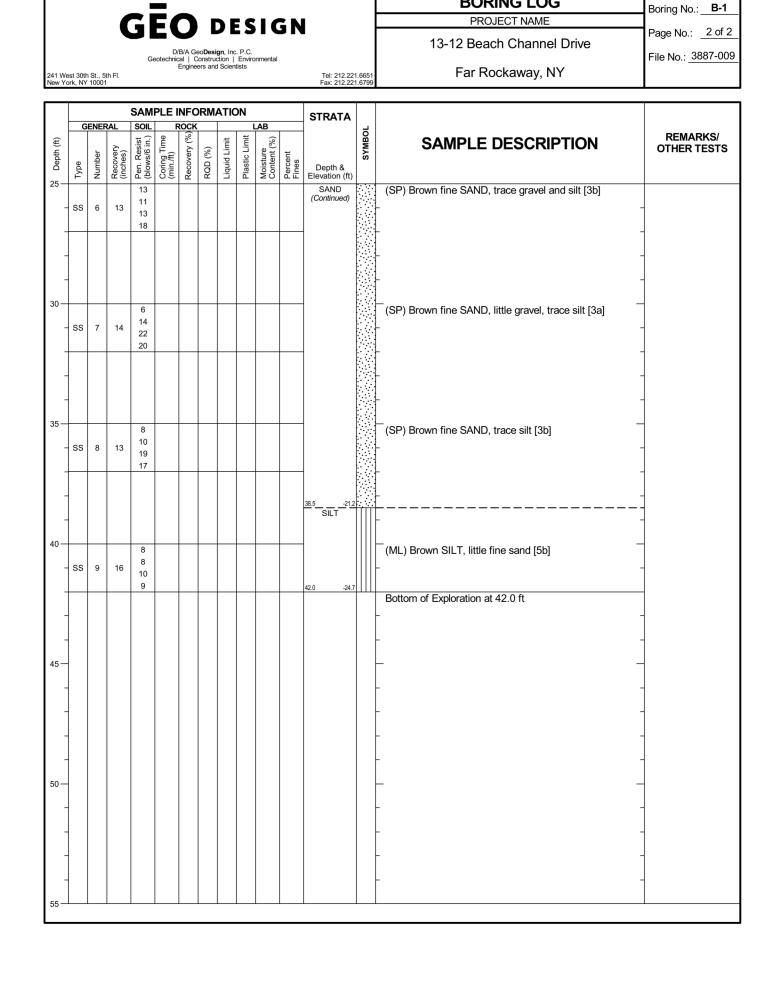
BATHING AREA SUCH THAT TRAVEL BETWEEN FIXTURES DOES NOT REQUIRE TRAVEL THROUGH OTHER PARTS OF THE UNIT, NOT MORE THAN ONE LAVATORY IS REQUIRED TO

SPACE SHALL BE CENTERED ON THE LAVATORY, EXCEPTION: A LAVATORY COMPLYING WITH SECTION 606 SHALL BE PERMITTED. CABINETRY SHALL BE PERMITTED UNDER THE

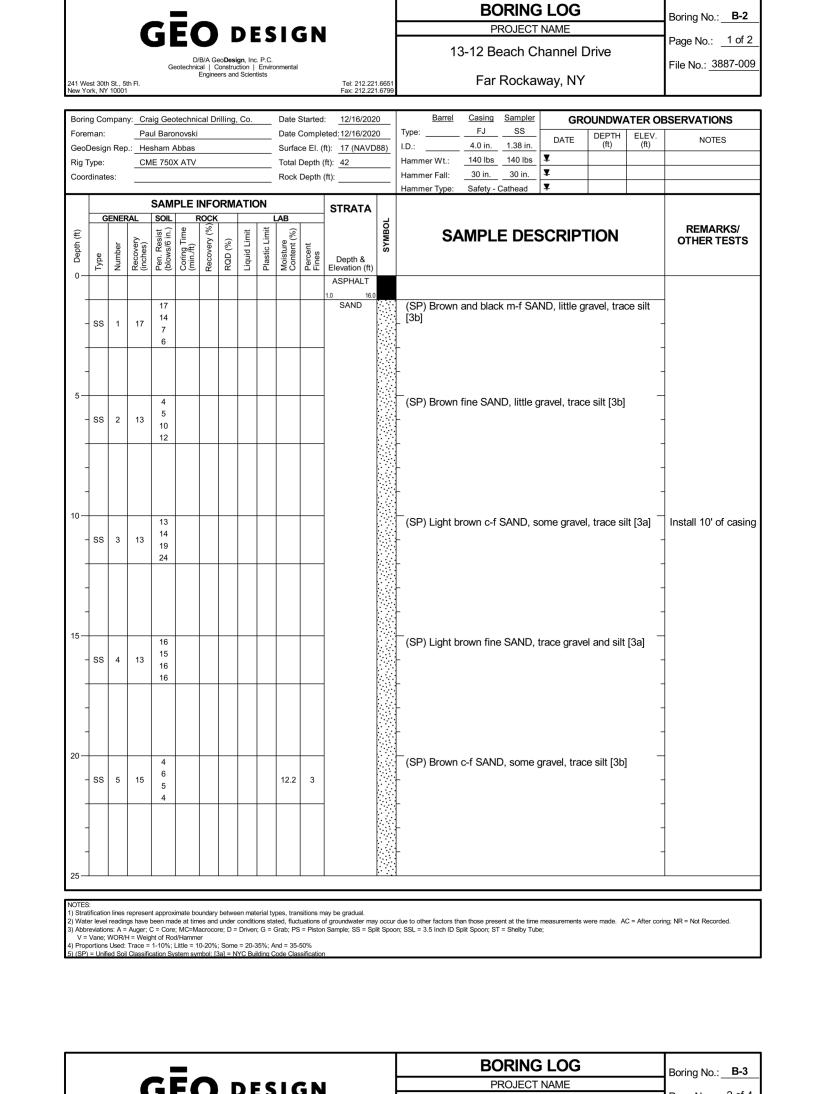
LAVATORY PROVIDED THE FOLLOWING CRITERIA ARE MET: (a) THE CABINETRY CAN BE REMOVED WITHOUT REMOVAL OR REPLACEMENT OF THE LAVATORY; AND (b) THE FLOOR FINISH EXTENDS UNDER THE CABINETRY; AND (c) THE WALLS BEHIND AND SURROUNDING THE CABINETRY ARE FINISHED.

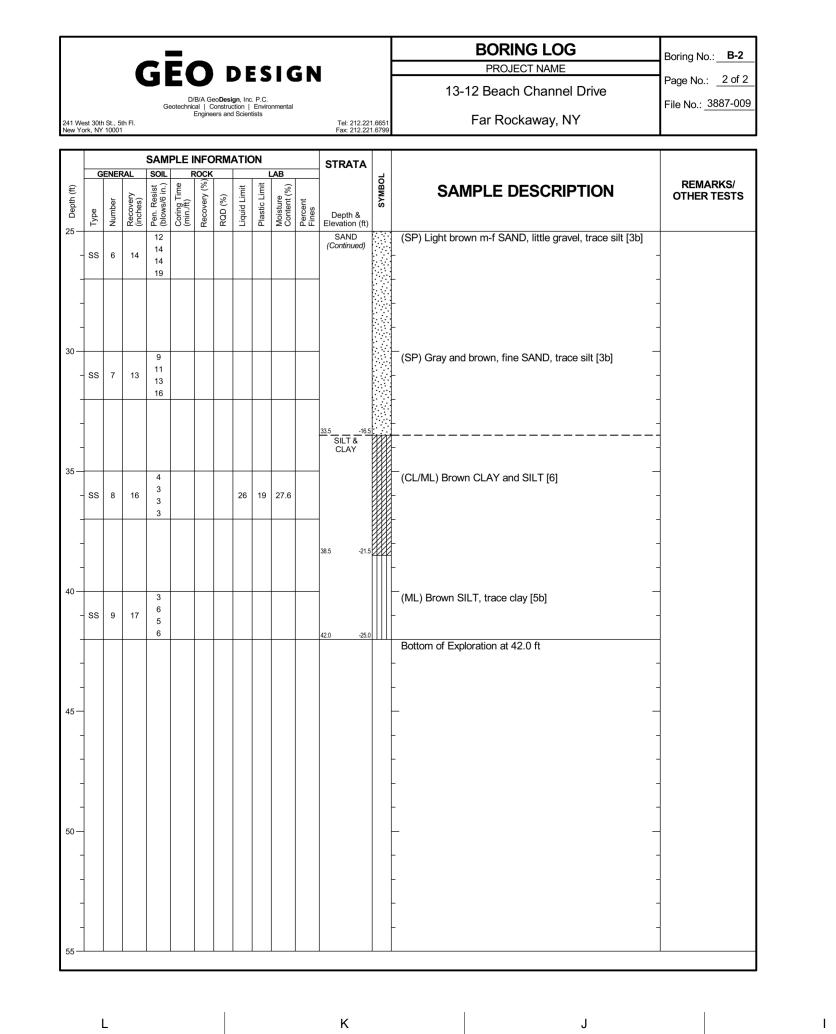






**BORING LOG** 

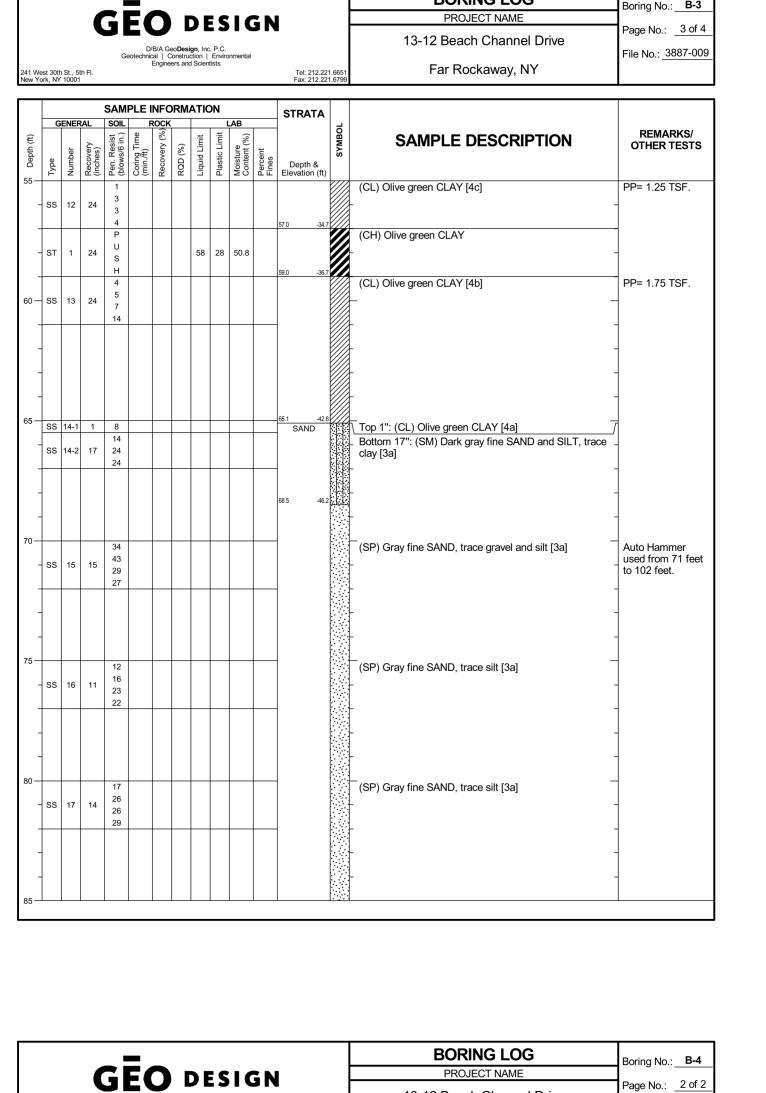




| 241 W<br>New Y | est 30tl         | n St., 5t | h Fl.             | Ge                           | eotechni                 | cal   C<br>Engine | ers and  | ction  <br>d Scien | Enviro        | onmental                |                  | Tel: 212.22<br>Fax: 212.22             | 1.6651<br>1.6799 | File No.: 3887-009   |
|----------------|------------------|-----------|-------------------|------------------------------|--------------------------|-------------------|----------|--------------------|---------------|-------------------------|------------------|--|------------------|--|
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
|                | ng Co<br>eman:   | mpan      |                   | iig Geo<br>ul Baro           |                          |                   | rilling, | , Co.              | —             |                         | Started<br>Compl | d: <u>12/10/202</u><br>eted: 12/10/202 |                  | Barrel   Casing   Sampler   GROUNDWATER OBSERVATIONS   |
|                |                  | n Rep     |                   | sham A                       |                          |                   |          |                    |               |                         |                  | (ft): 22.3 (NAV                        |                  | 1) I.D.: 4.0 in. 1.38 in. DATE (ft) (ft) NOTES   |
|                | Type:            |           | _CM               | E 750                        | X ATV                    |                   |          |                    | _             |                         |                  | (ft): 102                              | _                | Hammer Wt.: 140 lbs 140 lbs 4 Hammer Fall: 30 in. 30 in.   |
| Coo            | rdinat           | es:       | _                 |                              |                          |                   |          |                    | _             | Rock                    | Depth            | (ft):                                  | _                | Hammer Fall:         30 in.         30 in.         ▼           Hammer Type:         Safety - Cathead         ▼ |
|                |                  |           |                   | SAM                          |                          |                   |          | ATIC               | ON            |                         |                  | STRATA                                 |                  |  |
| <del></del>    | G                | ENER      | AL                | SOIL                         |                          | ROCK              |          | .=                 |               | AB                      |                  | -                                      | BOL              | REMARKS/   |
| Depth (ft)     | Type             | Number    | Recovery (inches) | Pen. Resist<br>(blows/6 in.) | Coring Time<br>(min./ft) | Recovery (%)      | RQD (%)  | Liquid Limit       | Plastic Limit | Moisture<br>Content (%) | Percent<br>Fines | Depth & Elevation (ft)                 | SYMBOL           | SAMPLE DESCRIPTION OTHER TESTS   |
| 0 –            | ╫                |           | ш О               | ш О                          | 00                       | LE.               | ш.       | _                  |               | 20                      |                  | -CONCRETE                              | .≽. &            | 2  |
|                |                  |           |                   | 1                            |                          |                   |          |                    |               |                         |                  | CONCRETE-<br>0.7 SAND 1.8              | 9.2              | (SP) Brown fine SAND, trace gravel and silt [6]  |
|                | ss               | 1         | 6                 | 1                            |                          |                   |          |                    |               |                         |                  |  |                  |  |
|                |                  |           |                   | 2<br>2                       |                          |                   |          |                    |               |                         |                  | ]                                      |                  | :[   |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
|                | 1                |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | 1  |
| 5 –            |                  |           |                   | 7                            |                          |                   |          |                    |               |                         |                  | 1                                      |                  | :<br>(SP) Light brown m-f SAND, some gravel, trace silt [3b]   |
|                | ss               | 2         | 10                | 13<br>15                     |                          |                   |          |                    |               |                         |                  |  |                  | }-   |
|                |                  |           |                   | 20                           |                          |                   |          |                    |               |                         |                  | _                                      |                  | ]_   |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
| -              | 1                |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | †  |
| 10 –           |                  |           |                   | 7                            |                          |                   |          |                    |               |                         |                  | 1                                      |                  | :<br>  |
|                | ss               | 3         | 13                | 9<br>10                      |                          |                   |          |                    |               |                         |                  |  |                  | -  |
|                |                  |           |                   | 18                           |                          |                   |          |                    |               |                         |                  | -                                      |                  | -  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | -  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  | ::::<br>::::     |  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
| 15 –           | $\vdash$         |           |                   | 18                           |                          |                   |          |                    |               |                         |                  | 1                                      |                  | (SP) Light brown m-f SAND, trace gravel and silt [3a]  |
|                | ss               | 4         | 16                | 28<br>29                     |                          |                   |          |                    |               |                         |                  |  |                  | ;}   |
|                | -                |           |                   | 39                           |                          |                   |          |                    |               |                         |                  | -                                      |                  | <del> </del>   |
|                | -                |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | ]  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | ]  |
| 20             |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
| 20 –           | ss               | 5         | 1                 | 30<br>38/0"                  |                          |                   |          |                    |               |                         |                  | ]                                      |                  | (SP) Light brown m-f SAND, trace gravel and silt [3a] 20 feet of casing installed.                             |
|                |                  |           |                   | 55,0                         |                          |                   |          |                    |               |                         |                  | 1                                      |                  | Spoon refusal at   |
|                | 1                |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | 20.5 feet. Inferred cobbles.   |
|                | -                |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | 1  |
|                |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  | 1  |
| 25 –           |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
| 20-            |                  |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |
| NOTE           | S:<br>atificatio |           |                   |                              |                          |                   |          |                    |               |                         |                  |  |                  |  |

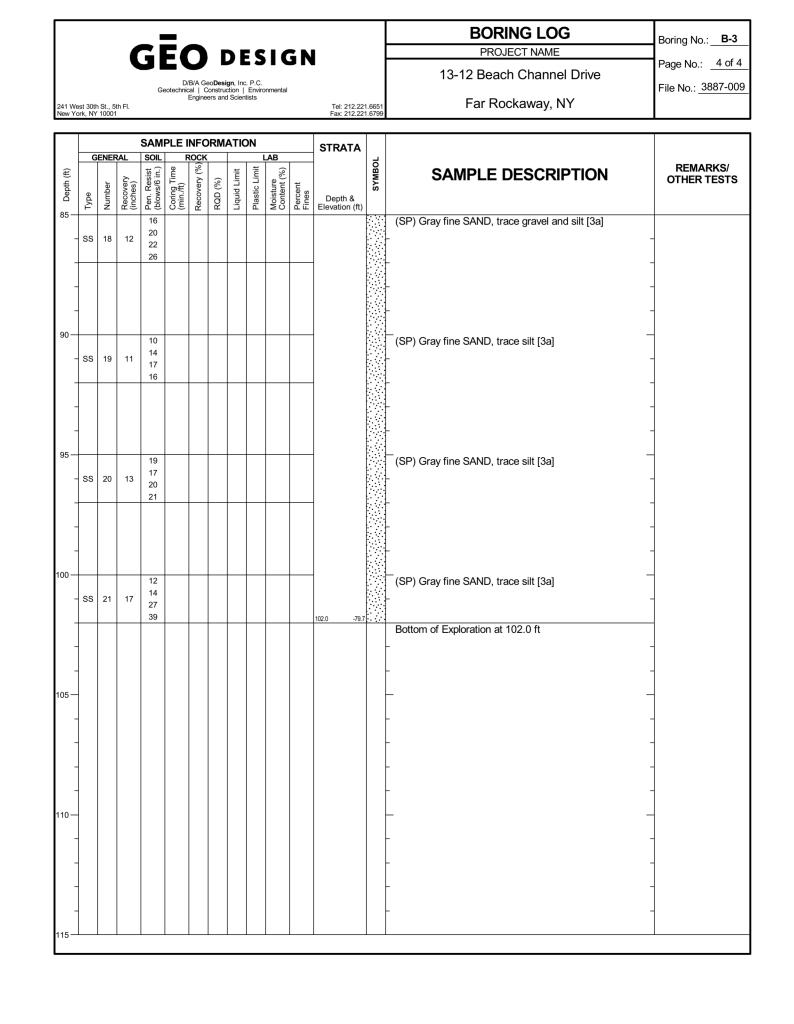
|            |      |        |                      | SAM                          | PLE I                 | NFC          | )RM     | ATIC         | DN            |                         |                  | STRATA                       |        |  |              |  |  |  |  |
|------------|------|--------|----------------------|------------------------------|-----------------------|--------------|---------|--------------|---------------|-------------------------|------------------|------------------------------|--------|--|--------------|--|--|--|--|
| (;         |      | SENER  |                      | SOIL                         | F                     | ROCK         |         |              | ı             | AB                      |                  | SIKAIA                       | 30L    | CAMPLE DECORPTION  | REMARKS/     |  |  |  |  |
| Depth (ft) | Туре | Number | Recovery<br>(inches) | Pen. Resist<br>(blows/6 in.) | Coring Time (min./ft) | Recovery (%) | RQD (%) | Liquid Limit | Plastic Limit | Moisture<br>Content (%) | Percent<br>Fines | Depth & Elevation (ft)       | SYMBOL | SAMPLE DESCRIPTION   | OTHER TESTS  |  |  |  |  |
| 25 —       | - ss | 6      | 16                   | 8<br>10<br>13<br>13          |                       |              |         |              |               | 14.7                    | 2                | SAND<br>(Continued)          |        | (SP) Light brown c-f SAND, little gravel, trace silt [3b]  |              |  |  |  |  |
| -          |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | -  |              |  |  |  |  |
| 30 —       |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | _  |              |  |  |  |  |
| -          | ss   | 7      | 20                   | 23<br>26<br>39               |                       |              |         |              |               |                         |                  |                              |        | (SP) Light brown c-f SAND, little gravel, trace silt [3a]  |              |  |  |  |  |
| -          |      |        |                      | 39                           |                       |              |         |              |               |                         |                  | _                            |        | _  |              |  |  |  |  |
| -          |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | _  | -            |  |  |  |  |
| 35 —       | ss   | 8      | 20                   | 20<br>21<br>24               |                       |              |         |              |               |                         |                  | _                            |        | (SP) Gray m-f SAND, little silt [3a]                       |              |  |  |  |  |
| -<br>I     |      |        |                      | 36                           |                       |              |         |              |               |                         |                  |                              |        | -  | -            |  |  |  |  |
| -          |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | -  | _            |  |  |  |  |
| 40 —       | ss   | 9-1    | 2                    | 10                           |                       |              |         |              |               |                         |                  | 40.1 -17.8<br>SILT &<br>CLAY |        | Top 2": (SP) Gray m-f SAND, little silt [3b]               | <u> </u><br> |  |  |  |  |
| -          | ss   | 9-2    | 12                   | 5 7                          |                       |              |         |              |               |                         |                  | J. J.                        |        | Bottom 12": (ML) Brown SILT, trace fine sand and clay [5b] |              |  |  |  |  |
| -          |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | _  | -            |  |  |  |  |
| 45 —       |      |        |                      | 8                            |                       |              |         |              |               |                         |                  | -                            |        | (ML) Brown SILT, trace fine sand and clay [5b]             | _            |  |  |  |  |
| -          | - ss | 10     | 18                   | 8<br>7<br>9                  |                       |              |         | 20           | 18            | 27.3                    |                  |                              |        | -  | _            |  |  |  |  |
| -<br>  -   |      |        |                      |                              |                       |              |         |              |               |                         |                  |                              |        | -  |              |  |  |  |  |
| 50 —       |      |        |                      | 7 8                          |                       |              |         |              |               |                         |                  |                              |        | (ML) Dark gray SILT, some shells, trace clay [5b]          |              |  |  |  |  |
| -          | - ss | 11     | 3                    | 8 9                          |                       |              |         |              |               |                         |                  |                              |        | -<br>-   | ]            |  |  |  |  |
| -          | +    |        |                      |                              |                       |              |         |              |               |                         |                  | 53.5 -31.2                   |        | _  | -            |  |  |  |  |

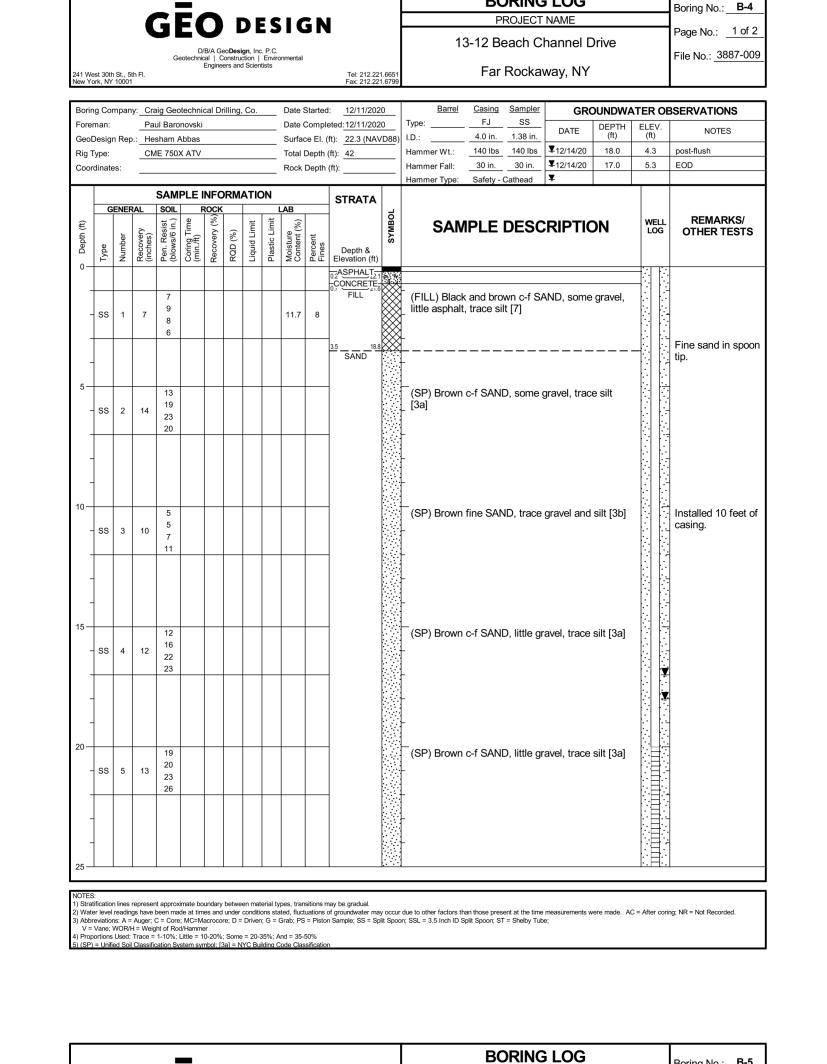
**Beach Channel Drive** □ 13-12 Beach Channel Drive, Far Rockaway, NY 11691 BRC & CPG T:212/979/1510 E:post@uai-ny.com www.uai-ny.com Consultants STRUCTURAL ENGINEER GACE Consulting Engineers 105 Madison Avenue, Floor 6, New York, NY 10016 MEP ENGINEER Skyline Engineering
42 West 39th Street, Floor 10, NY 10018 CIVIL ENGINEER Krypton Engineering 527 W 48th Street, Ground Floor, New York, NY LANDSCAPE ARCHITECT Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215 CODE CONSULTANT William Vitacco Associates Ltd. 299 Broadway, 5th Floor, New York, NY 10007 Plot Plan /BLOCK 15528/ /LOTS 5,6,& 9///// /ZONING DISTRICT R6/ For Department of Buildings Use Issuance Schedule No. Date Description 1.1 | 06/14/21 | DOB PROGRESS SET 1.2 | 06/28/21 | ISSUED FOR FILING 08/13/21 50% CD 10/29/21 90% CD 3.1 | 11/08/21 | HPD BLDS SUBMISSION 4 | 12/10/21 | 100% CD **BORING LOG I** Sign & Seal Drawing No. B-101.00 12/10/21 20.15 Author DOB sheet sheet scale checked by Checker DOB NUMBER Q00540608-I1



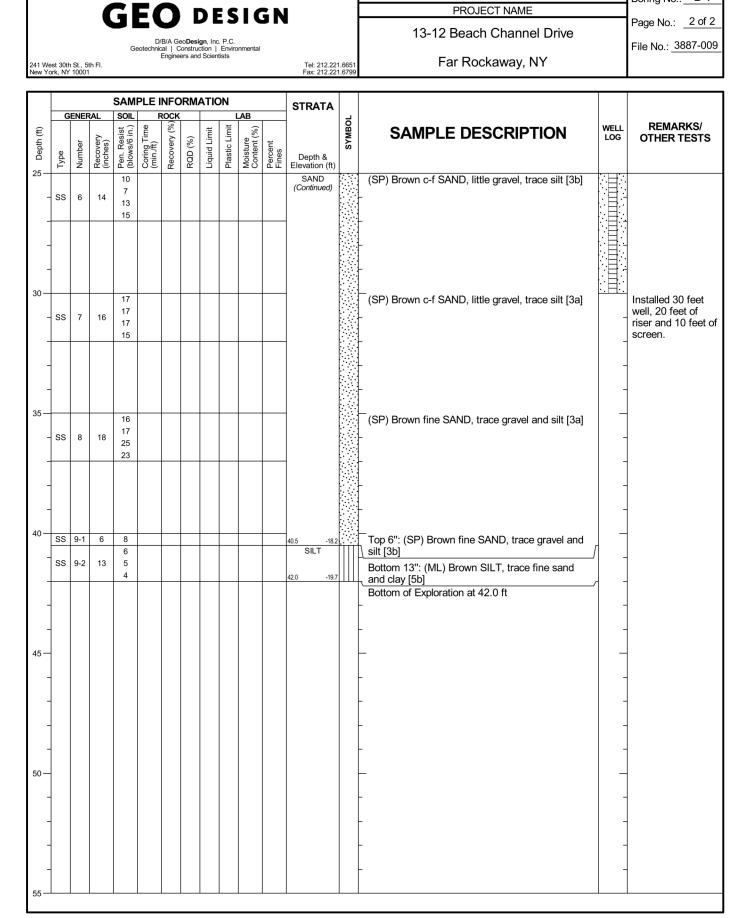
**BORING LOG** 

PROJECT NAME





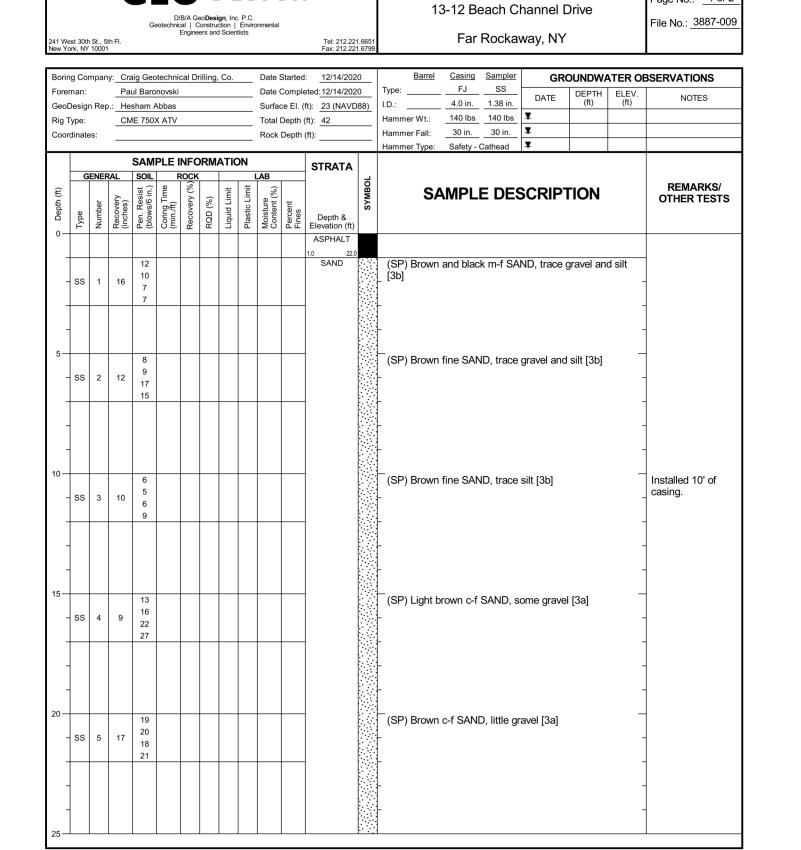
**BORING LOG** 



|  |                     |                  |                               | <u>~</u> i                   | Ē                        |            |   | <b>)</b> E          | : c                 | 1                       | 2 N                | ı                                      |                    |  |                              | ROJECT                          | NAME               |              |               | Boring No.: B-5           |
|--|---------------------|------------------|-------------------------------|------------------------------|--------------------------|------------|---|---------------------|---------------------|-------------------------|--------------------|--|--------------------|--|------------------------------|---------------------------------|--------------------|--------------|---------------|---------------------------|
|  |                     |                  | •                             | J                            |                          |            |   |                     |                     | 1                       | J  1               | 1                                      |                    | 13-  |                              |                                 | hannel             | Drive        |               | Page No.: 1 of 2          |
|  |                     |                  |                               | G                            | eotechnic                | cal   C    | eo <b>Desi</b> g<br>Construc<br>ers and | ction               | Enviro              | nmental                 |                    |  |                    |  | Го.,                         | Doolso                          | NIX                | ,            |               | File No.: <u>3887-009</u> |
| 241 Wo<br>New Y  | est 30th<br>ork, NY | St., 59<br>10001 | th Fl.                        |                              |                          |            |   |                     |                     |                         |                    | Tel: 212.22<br>Fax: 212.22             | 1.6651<br>1.6799   |  | Far                          | Rocka                           | way, NY            | ,            |               |                           |
| Borir  | ng Coi              | mpan             | y:_Cra                        | aig Geo                      | otechni                  | cal Di     | rilling,                                | Co.                 |                     | Date \$                 | Started            | 12/15/202                              | 20                 | Barrel   | Casing                       | Sampler                         | GR                 | OUNDW        | ATER O        | BSERVATIONS               |
| Foreman:         Paul Baronovski         Date Completed: 12/15/2020           GeoDesign Rep.:         Hesham Abbas         Surface El. (ft): 17.5 (NAVD88) |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  | Type:              | FJ<br>4.0 in.  | SS<br>1.38 in.               | DATE                            | DEPTH (ft)         | ELEV.        | NOTES         |                           |
|  | Desigi<br>Type:     | 1 Кер            |                               | sham <i>i</i><br>1E 750:     |                          |            |   |                     | _                   |                         |                    | ft): 17.5 (NA)<br>(ft): 42             | / <u>D88</u> )     | I.D.: Hammer Wt.:                                      | 140 lbs                      | 140 lbs                         | ¥                  | (11)         | (11)          |                           |
| Cooi   | rdinate             | es:              |                               |                              |                          |            |   |                     |                     | Rock                    | Depth              | (ft):                                  | _                  | Hammer Fall: _<br>Hammer Type:                         | 30 in.                       | 30 in.                          | Ť                  |              |               |                           |
|  |                     |                  |                               | SAM                          | PLE I                    | NFC        | DRM.                                    | ATIC                | ON                  |                         |                    | STRATA                                 |                    | папппет туре.  | Galety                       | Cathead                         | -                  |              |               |                           |
| £  | G                   | ENEF             | RAL                           | SOIL<br>to C                 |                          | ROCK<br>®  |   | ij                  |                     | AB                      |                    |  | BOL                | CAI  | MDI                          | E DEG                           | SCRIP              | TION         |               | REMARKS/                  |
| Depth (ft)   | Φ                   | Number           | Recovery<br>(inches)          | Pen. Resist<br>(blows/6 in.) | Coring Time<br>(min./ft) | Recovery ( | RQD (%)                                 | Liquid Limit        | Plastic Limit       | Moisture<br>Content (%) | Percent<br>Fines   |  | SYMBOL             | SAI  | IVIPL                        | E DE                            | CRIP               | HON          |               | OTHER TESTS               |
| 0-   | Туре                | Nun              | Rec<br>(incl                  | Pen<br>(blo                  | Sori<br>miri             | Rec        | RQI                                     | Liqu                | Plas                | Mois                    | Perc               |  |                    |  |                              |                                 |                    |              |               |                           |
|  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    | ASPHALT<br>1.0 16.5                    | 5                  |  |                              |                                 |                    |              |               |                           |
|  | 00                  | 4                | 40                            | 12<br>11                     |                          |            |   |                     |                     |                         |                    | SAND                                   |                    | (SP) Light bro   | own c-f                      | SAND, li                        | ttle gravel        | , trace silt | [3b]          |                           |
| -  | SS                  | 1                | 13                            | 11<br>11                     |                          |            |   |                     |                     |                         |                    |  |                    | =  |                              |                                 |                    |              |               |                           |
| -  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    | •                                      |                    | -  |                              |                                 |                    |              |               |                           |
| -  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | 1                         |
| 5—   |                     |                  |                               | 7                            |                          |            |   |                     |                     |                         |                    |  |                    | _<br>(SP) Brown a                                      | nd gray                      | fine SAN                        | ND, trace          | silt [3b]    | -             |                           |
| -  | ss                  | 2                | 10                            | 8<br>10                      |                          |            |   |                     |                     |                         |                    |  |                    | =  |                              |                                 |                    |              |               | _                         |
| -  |                     |                  |                               | 12                           |                          |            |   |                     |                     |                         |                    |  |                    | _  |                              |                                 |                    |              |               | _                         |
| -  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | _                         |
| _  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | _                         |
| 10 —   |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | (OD)   :   |                              | CAND                            |                    |              |               |                           |
| _  | SS                  | 3                | 12                            | 8<br>14                      |                          |            |   |                     |                     |                         |                    |  |                    | (SP) Light bro   | own m-1                      | SAND, I                         | ittie grave        | i, trace sii | it [3D]       | Installed 10' casing.     |
| _  |                     |                  |                               | 12<br>16                     |                          |            |   |                     |                     |                         |                    |  |                    | _  |                              |                                 |                    |              |               |                           |
|  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    |  |                              |                                 |                    |              |               |                           |
|  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    |  |                              |                                 |                    |              |               |                           |
| -  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | _  |                              |                                 |                    |              |               |                           |
| 15 —   |                     |                  |                               | 10<br>15                     |                          |            |   |                     |                     |                         |                    | •                                      |                    | (SP) Light bro   | own m-1                      | SAND, I                         | ittle grave        | l, trace sil | lt [3a] ¯     |                           |
| -  | SS                  | 4                | 13                            | 18                           |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | 1                         |
| -  |                     |                  |                               |                              |                          |            | $\vdash$                                |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | -                         |
| -  | -                   |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | -                         |
| -  | -                   |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | -                         |
| 20 —   |                     |                  |                               | 5                            |                          |            | $\vdash$                                |                     |                     |                         |                    |  |                    | <br>(SP) Light bro                                     | own c-f                      | SAND. li                        | ttle gravel        | , trace silt | : [3b] -      | -                         |
| -  | ss                  | 5                | 7                             | 7 5                          |                          |            |   |                     |                     | 13.6                    | 2                  |  |                    | -  |                              |                                 | 3.3.31             |              | J             | -                         |
| -  |                     |                  |                               | 6                            |                          |            |   |                     |                     |                         |                    |  |                    | -  |                              |                                 |                    |              |               | _                         |
| -  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | _  |                              |                                 |                    |              |               | _                         |
| _  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    | _  |                              |                                 |                    |              |               |                           |
| or.  |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    |  |                              |                                 |                    |              |               |                           |
| 25 —   |                     |                  |                               |                              |                          |            |   |                     |                     |                         |                    |  |                    |  |                              |                                 |                    |              |               |                           |
|  | tification          |                  |                               |                              |                          |            |   |                     |                     |                         |                    | nay be gradual.                        |                    |  |                              |                                 |                    |              |               |                           |
| 3) Abb   | reviation           | ns: A =          | gs have<br>Auger;<br>H = Weig | C = Core                     | ; MC=M                   | acroco     | l under o<br>re; D =                    | condition<br>Driven | ons sta<br>i; G = 0 | ted, fluct<br>Grab; PS  | uations<br>= Pisto | of groundwater ma<br>n Sample; SS = Sp | y occu<br>olit Spo | due to other factors than<br>n; SSL = 3.5 Inch ID Spli | n those pres<br>it Spoon; ST | ent at the time<br>= Shelby Tub | measurements<br>e; | were made. A | AC = After co | ring; NR = Not Recorded.  |

|                  |   |                  |                   | Ge                           | eotechnic | B/A Ge<br>al   C<br>Engine | eo <b>Desi</b> gonstructions<br>ers and | ction        | Enviro        | nmental                 |                  |                            |                 |   | File No.: 3887-00       |
|------------------|---|------------------|-------------------|------------------------------|-----------|----------------------------|---|--------------|---------------|-------------------------|------------------|----------------------------|-----------------|---|-------------------------|
| 241 We<br>New Yo | est 30th<br>ork, NY                       | St., 5t<br>10001 | h Fl.             |                              |           |                            |   |              |               |                         |                  | Tel: 212.22<br>Fax: 212.22 | .6651<br>i.6799 | Far Rockaway, NY  |                         |
|                  | SAMPLE INFORMATION  GENERAL SOIL ROCK LAB |                  |                   |                              |           |                            |   |              |               | ΔR                      |                  | STRATA                     |                 |   |                         |
| Depth (ft)       | Type                                      | Number           | Recovery (inches) | Pen. Resist<br>(blows/6 in.) |           | Recovery (%)               | RQD (%)                                 | Liquid Limit | Plastic Limit | Moisture<br>Content (%) | Percent<br>Fines | Depth &<br>Elevation (ft)  | SYMBOL          | SAMPLE DESCRIPTION  | REMARKS/<br>OTHER TESTS |
| 25 —             | - SS                                      | 6                | 10                | 9<br>9<br>11<br>13           |           |                            |   |              |               |                         |                  | SAND<br>(Continued)        |                 | (SP) Brown c-f SAND, little gravel, trace silt [3b]   | -                       |
| -<br>30 —<br>-   | - SS                                      | 7                | 13                | 13<br>13<br>16<br>15         |           |                            |   |              |               |                         |                  |                            |                 | -<br>(SP) Brown fine SAND, trace silt [3b]<br>-   | -                       |
| 35 —             | - SS                                      | 8                | 18                | 4<br>4<br>3<br>4             |           |                            |   |              |               |                         |                  | 33.5                       |                 | -<br>-<br>(ML) Brown SILT, trace fine sand and clay [6]<br>-  |                         |
| -<br>40 —<br>-   | ss  | 9-1              | 23                | 3<br>4<br>3<br>3             |           |                            |   |              |               |                         |                  | 41.5 -24.0<br>42.0 -24.5   |                 | Top 23": (ML) Brown SILT, trace fine sand and clay [6]  Bottom 1": (CL) Dark gray CLAY [4c]  Bottom of Exploration at 42.0 ft | -<br>-<br>-             |
| -<br>45 —        |   |                  |                   |                              |           |                            |   |              |               |                         |                  |                            |                 | -<br>-<br>-   |                         |
| 50 —             | -   |                  |                   |                              |           |                            |   |              |               |                         |                  |                            |                 | -<br>-<br>-   |                         |
| -                | -   |                  |                   |                              |           |                            |   |              |               |                         |                  |                            |                 | -<br>-<br>-   | -                       |
| -<br>55 —        | -   |                  |                   |                              |           |                            |   |              |               |                         |                  |                            |                 | -   | -                       |

**Beach Channel Drive** <sup>2</sup> 13-12 Beach Channel Drive, Far Rockaway, NY 11691 BRC & CPG T:212/979/1510 E:post@uai-ny.com www.uai-ny.com Consultants STRUCTURAL ENGINEER GACE Consulting Engineers 105 Madison Avenue, Floor 6, New York, NY 10016 MEP ENGINEER Skyline Engineering
42 West 39th Street, Floor 10, NY 10018 Krypton Engineering 527 W 48th Street, Ground Floor, New York, NY LANDSCAPE ARCHITECT Liz Farrell Landscape Architecture 523 6th Ave, Brooklyn, NY 11215 CODE CONSULTANT William Vitacco Associates Ltd. 299 Broadway, 5th Floor, New York, NY 10007 Plot Plan /BLOCK 15528/ /LOTS 5,6,& 9///// /ZONING DISTRICT R6/ For Department of Buildings Use Issuance Schedule No. Date Description 1.1 06/14/21 DOB PROGRESS SET 1.2 06/28/21 ISSUED FOR FILING 08/13/21 50% CD 10/29/21 90% CD 3.1 | 11/08/21 | HPD BLDS SUBMISSION 4 | 12/10/21 | 100% CD **BORING LOG II** Sign & Seal Drawing No. B-102.00 12/10/21 20.15 Author DOB sheet sheet scale checked by Checker DOB NUMBER Q00540608-I1



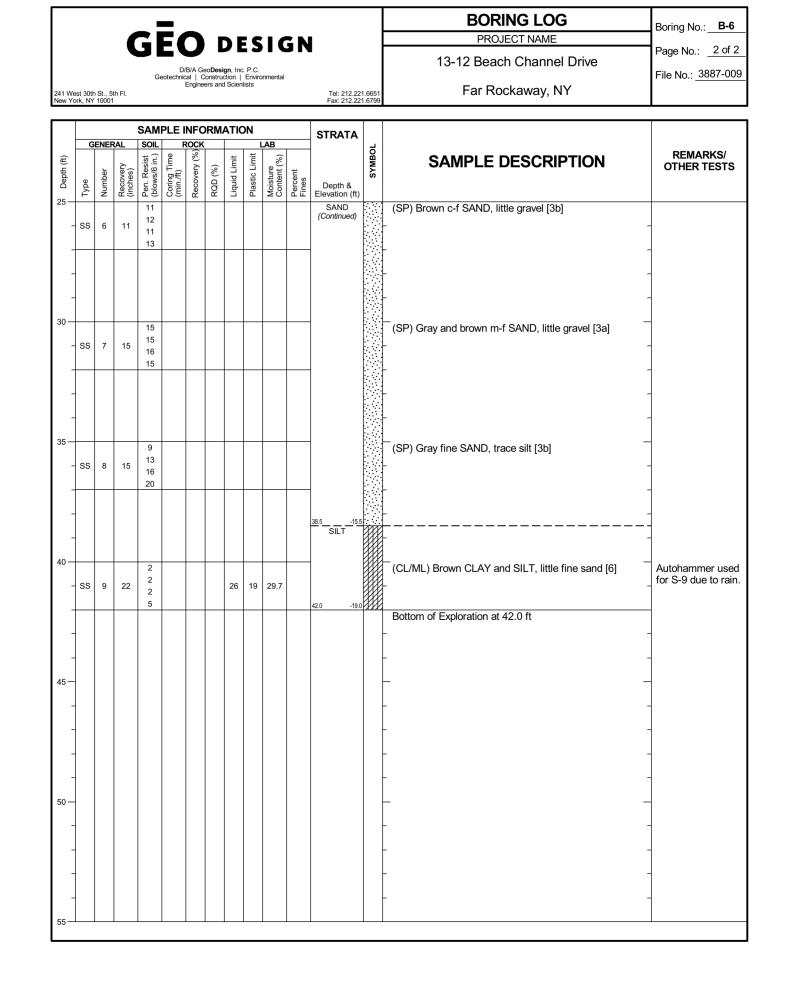
transcation intes represent approximate boundary between fraterial types, transitions may be gradual, after level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. AC = After coring; NR = Not Recorded. bireviations: A = Auger; C = Core; MC=Macrocore; D = Driven; G = Grab; PS = Piston Sample; SS = Split Spoon; SSL = 3.5 Inch ID Split Spoon; ST = Shelby Tube; 'e Vane; WORHH = Weight of Rod/Hammer roportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

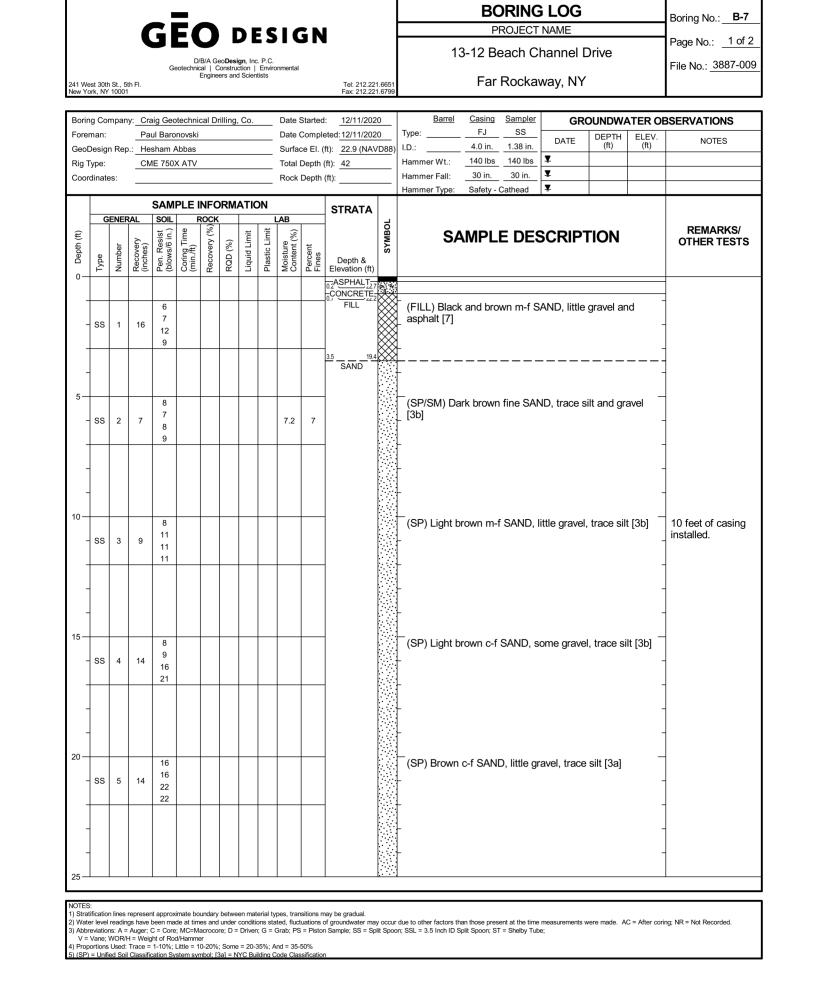
GEO DESIGN

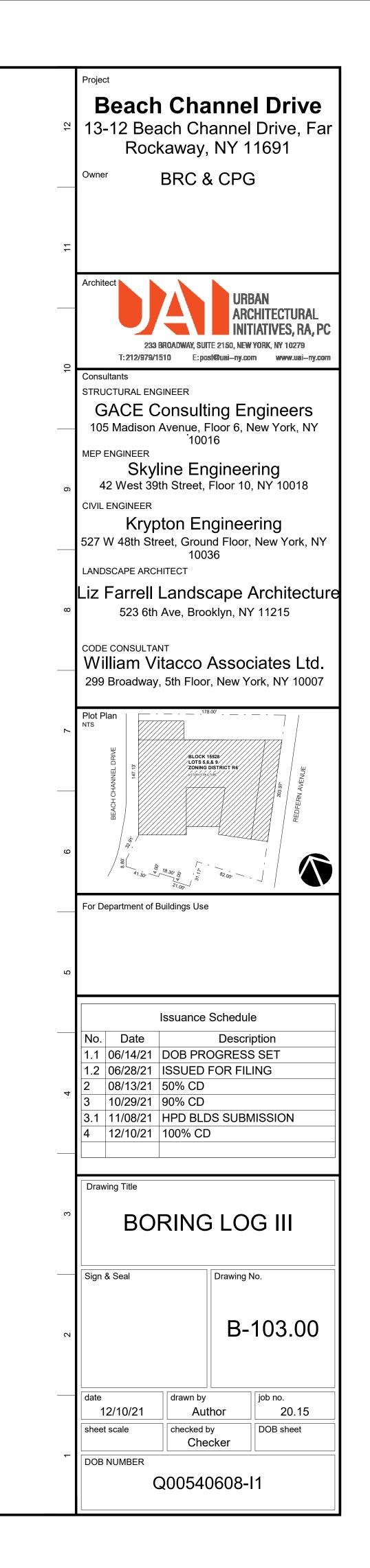
atification lines represent approximate boundary between material types, transitions may be gradual.

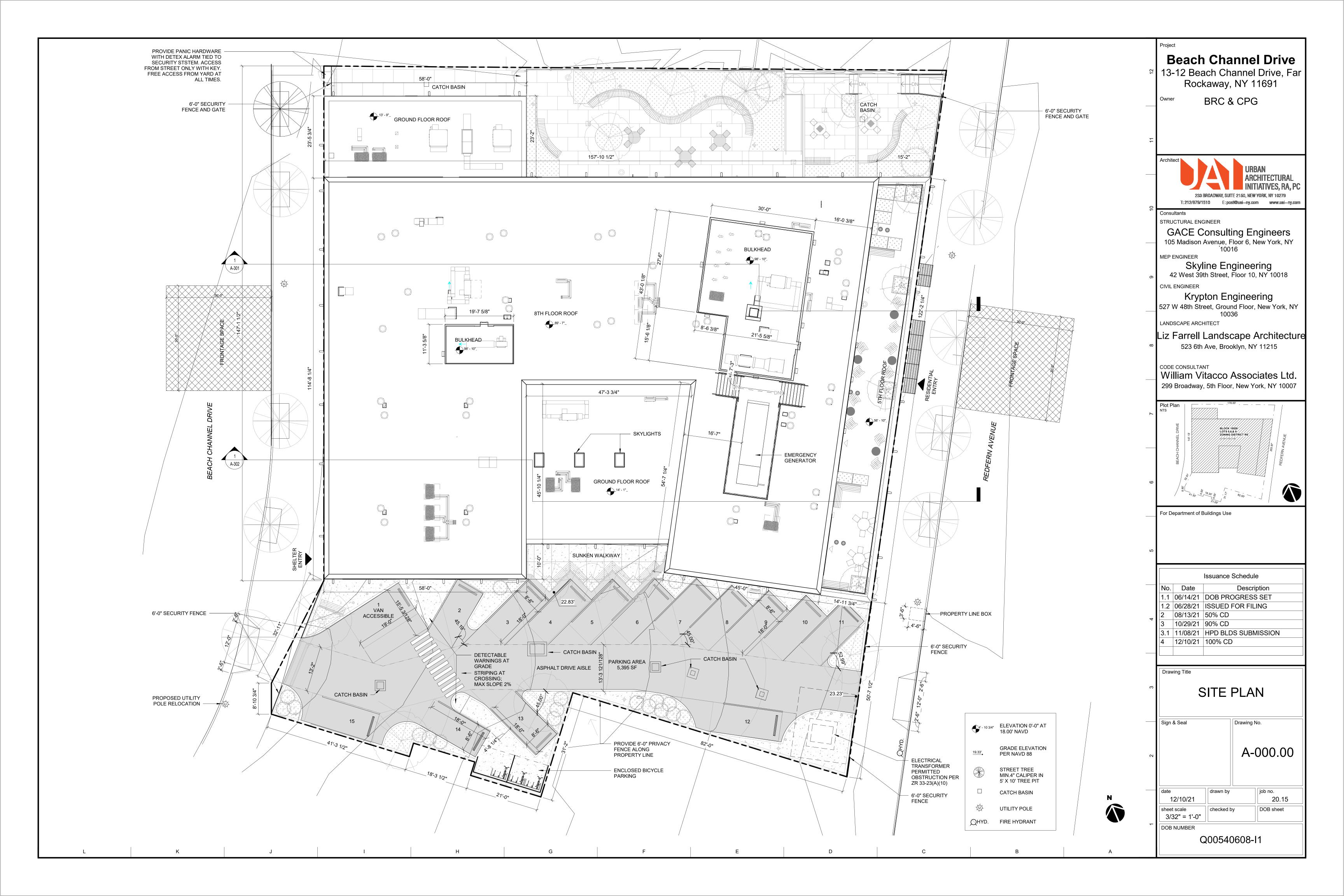
**BORING LOG** 

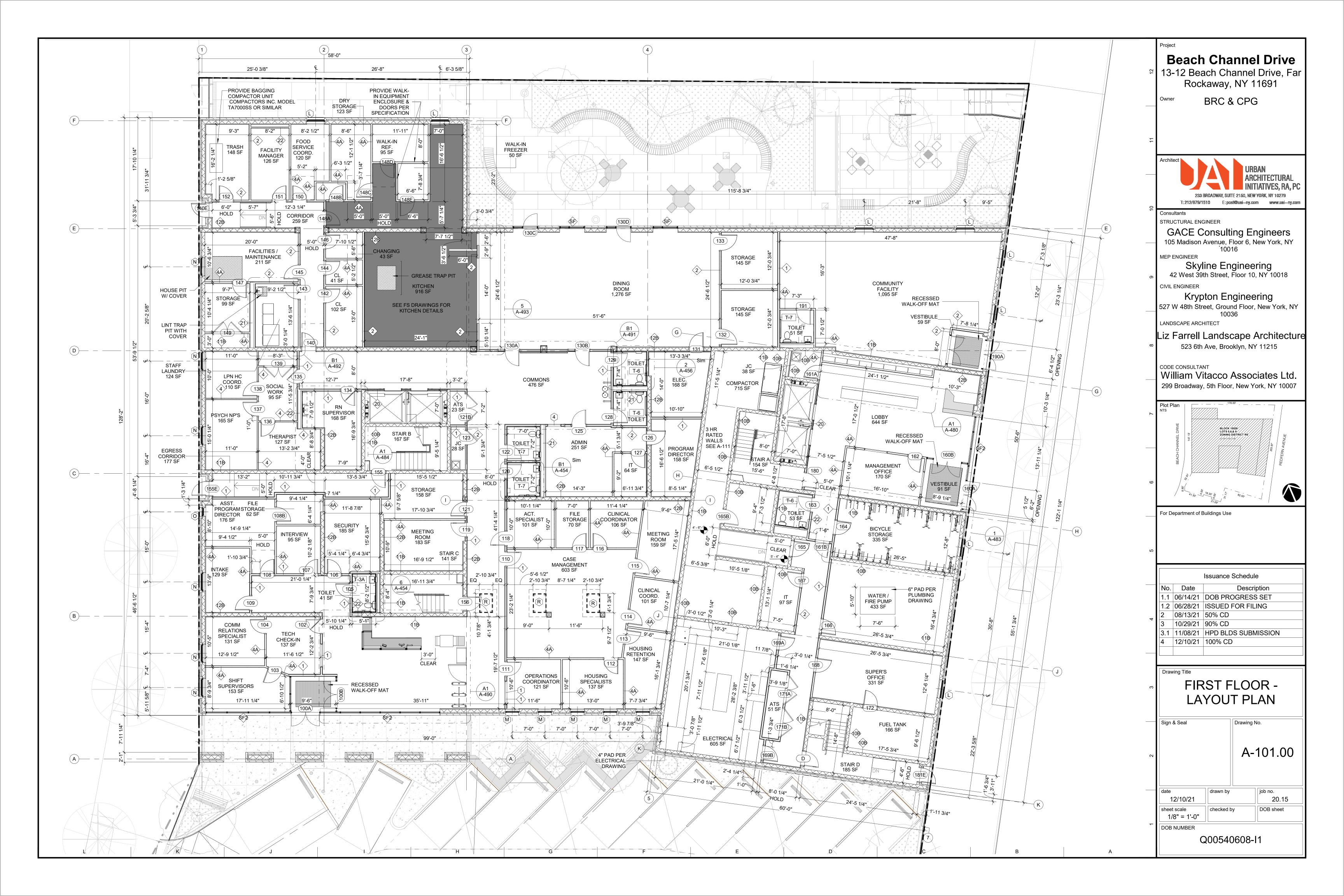
PROJECT NAME











## Appendix C

Citizens Participation Plan

Remedial Action Work Plan
NYSDEC BCP #C241254





## **Brownfield Cleanup Program**

# Citizen Participation Plan for 13-12 Beach Channel Drive

April 2021

BCP No: C241254 13-12, 13-16 and 13-24 Beach Channel Drive Far Rockaway, NY New York Tax Map Designation: Block 15528; Lot 5, 6 and 9

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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: **BCD Owner LLC ("Applicant")** 

Site Name: 13-12 Beach Channel Drive ("Site")

Site Address: 13-12, 13-16, and 13-24 Beach Channel Drive

Site County: Queens County

Site Number: C241254

#### 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: <a href="http://www.dec.ny.gov/chemical/8450.html">http://www.dec.ny.gov/chemical/8450.html</a>

#### 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 forpurposes 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 <a href="http://www.dec.ny.gov/chemical/61092.html">http://www.dec.ny.gov/chemical/61092.html</a>.

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.

- **Document Repositories** provide locations where the public can read and review any finalized documents produced as part of the cleanup program. The repositories for physical copies of the reports are as follows:
  - Queens Public Library Central Branch 89-11 Merrick Boulevard Jamaica, NY 11432 (718) 990-0700
  - Queens Community Board 14
    1931 Mott Avenue
    Far Rockaway, NY 11619
    (718) 471 7300
    Cbrock14@nyc.rr.com
    Dolores Orr –
    Chairwoman
    Johnathan Gaska –
    District Manager
    Dan Mundy –
    Environmental
    Committee Chairman

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 <a href="http://www.dec.ny.gov/regulations/2590.html">http://www.dec.ny.gov/regulations/2590.html</a>

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:  |   |  |  |  |  |
| <ul><li>Prepare site contact list</li><li>Establish document repository(ies)</li></ul>  | At time of preparation of application to participate in the BCP.  |  |  |  |  |
| <ul> <li>Publish notice in Environmental Notice         Bulletin (ENB) announcing receipt of         application and 30-day public comment         period</li> <li>Publish above ENB content in local         newspaper</li> <li>Mail above ENB content to site contact list</li> <li>Conduct 30-day public comment period</li> </ul> | 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 Remed  | dial Investigation (RI) Work Plan:  |  |  |  |  |
| <ul> <li>Distribute fact sheet to site contact list<br/>about proposed RI activities and<br/>announcing 30-day public comment period<br/>about draft RI Work Plan</li> <li>Conduct 30-day public comment period</li> </ul>  | 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 F  | Remedial Work Plan (RWP):   |  |  |  |  |
| <ul> <li>Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period</li> <li>Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager)</li> <li>Conduct 45-day public comment period</li> </ul>                         | 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:   |  |  |  |  |
| <ul> <li>Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report</li> <li>Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)</li> </ul> | 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.

As shown in the NYSDEC Potential Environmental Justice Areas in Southern Queens County Map, the Site is in a Potential 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.

Based on the information collected to date, subsurface soil vapor on the Site is known to be contaminated with chlorinated solvents from an unknown source(s) as it does not correspond with the historical site uses. Soil in limited areas contain elevated volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and heavy metals. The SVOCs and metals are typical of non-native fill used to modify land elevation for building purposes; and groundwater contains elevated level of tetrachloroethene (PCE), a commonly known dry-cleaning chemical, and low-levels of SVOCs. Groundwater in the area of the Site is not a source of potable water. Public drinking water is managed and supplied by the NYCDEP from update watersheds and tested to assure compliance with the standards, therefore, any contaminated groundwater which may be present is not a major issue of public concern unless it is contributing to the migration of contaminated vapors off-site. Based upon the collected soil vapor data, the affected area appears to be limited to the Site. Contaminants are discussed in further detail in Section 4 below. The identified contaminants will be further assessed, delineated, and remediated to the extent required to protect public health and support the redevelopment of the Site.

Other major issues of concern may include air quality, health of workers and community, nuisance odors, noise, and construction-related traffic. These issues are of the most concern to site workers and adjacent property owners, businesses, and residents. These issues will be addressed in the Remedial Action Work Plan (RAWP), a Community Air Monitoring Program (CAMP) and a site-specific Construction Health and Safety Plan (CHASP) for the project to be approved by the NYSDEC and the New York State Department of Health (NYSDOH) prior to work being performed.

Site information is available through Project Contacts mentioned in Section 2 and Appendix A. The BCP Application, which includes the previous site investigations and the RIWP and identifies future reports to be prepared for the NYSDEC, are available in the document repository discussed above in Section 2 and in Appendix A. The RIWP includes schedules for the planned work. The site is located in a community with a sizable Hispanic-American population nearby. Therefore, all future fact sheets will be translated into Spanish.

For additional information, visit: https://popfactfinder.planning.nyc.gov/profile/4424/demographic

#### 4. Site Information

**Appendix C** contains a map identifying the location of the site.

Site Description

The Site is composed of three contiguous parcels addressed 13-12, 13-16, and 13-24 Beach Channel Drive in the Far Rockaway neighborhood of Queens County, New York. The Site is situated between Beach Channel Drive to the west and Redfern Avenue to the east. The Site has a total footprint of approximately 33,095 square-feet (or 0.76-acres) and each parcel is developed with a single unoccupied building. 13-12 Beach Channel Drive is developed with a one-story slab-on-grade building, formerly utilized as a fast-food restaurant, with exterior areas comprised of asphalt and concrete paved parking and driveway areas. 13-16 Beach Channel Drive is developed with a three-story building with a partially sub-grade basement, formerly utilized as a church and residential apartment building, with exterior areas comprised of concrete paved parking areas. Finally, 13-24 Beach Channel Drive is developed with a one-story slab-on-grade building, formerly utilized as a carwash, with exterior areas comprised of asphalt and concrete paved parking.

Surrounding property usage is comprised of:

- <u>North:</u> small commercial storefronts along Beach Channel Drive, including a beauty salon, barber shop, pizza shop, deli grocery store, Guyanese/Caribbean restaurant. To the north/northeast, the Site is bordered by residential apartments.
- <u>East:</u> Redfern Avenue followed by the Rockaway Village construction site to the east. Currently, two 10-story residential buildings are being constructed.
- <u>South:</u> small commercial storefronts including a pizza shop, deli grocery, Chinese restaurant, home sportswear, shoe repair, dry-cleaner, check cashing, electronic store,

Jamaican cuisine, and fish store.

• <u>East:</u> Beach Channel Drive followed by Shop Fair Supermarket, Klean and Kleaner Coin Laundry, and Taco Bell.

According to the September 30, 2020 topographic survey prepared by Precision Surveys, the site grade ranges from elevation 23.67± (NAVD88) in the southeast corner of the site to el 17.10± in the northwest corner of the Site. The topography of the Site and surrounding area is generally level with a gradual slope to the west towards Beach Channel Drive.

According to the New York City Planning Commission Zoning Map 25b, the site is located within a residential district (R6) with a commercial overlay (C2-4).

History of Site Use, Investigation, and Cleanup

Currently, all three onsite buildings are unoccupied. The Site is currently protected on all sides by a chain link fence to prevent trespassing.

Historical uses of the Site have included a mix of retail commercial operations and residential uses, including most recently a KFC Restaurant (13-12 Beach Channel Drive, Lot 5), a church and residential apartment building (13-16 Beach Channel Drive, Lot 6), and a car wash and auto laundry (13-24 Beach Channel Drive, Lot 9). There is no documented usage of hazardous substances, nor are there any listings for hazardous substance use at the three addresses, based on a review of historical and regulatory databases.

Prior to entry into the NYSDEC BCP, the site was the subject of environmental site assessments and a remedial investigation, which are documented in the following reports:

- Phase I ESA for 13-12 Beach Channel Drive (Lot 5) by Singer Environmental Group, LTD. –
   November 7, 2018
- Phase I ESA Review Letter for 13-16 Beach Channel Drive (Lot 6) by Singer Environmental Group, LTD. – September 18, 2018
- Phase I ESA Review Letter for 13-24 Beach Channel Drive (Lot 9) by Singer Environmental Group, LTD. September 21, 2018
- Tenen Environmental, LLC Due Diligence Phase II Environmental Site Investigation (ESI), August 2, 2018
- Impact Environmental Closures, Inc. Remedial Investigation, October/November 2020

These reports noted above were prepared for the three properties that comprise the brownfield site. The following is a summary of each report listed above:

#### Singer Environmental Group, LTD (SEG) Phase I ESA, November 7, 2018

• The Property (13-12 Beach Channel Drive – Lot 5) is approximately 10,500 square feet in area and was developed with a 1-story commercial building occupied by a KFC restaurant.

- According to Environmental Data Resources (EDR), a dry-cleaner is listed at 21-40 Mott Avenue from 1975 through 2014. According to EDR, this site is listed at a lower elevation than the subject property.
- A commercial building with a sign stating "Cleaners" is located to the east of the subject property. According to EDR, a dry-cleaner is listed at 20-88 Mott Avenue from 1986 through 2014. This site is located across the street from the subject property.
- The Site is an "E" Designated site with the NYC Department of Planning for Hazmat and Noise.
- Due to the fact that the site has an E-Designation for Hazardous Materials, in accordance with OER's (Office of Environmental Remediation) requirements, prior to obtaining a building permit for redevelopment of the Site, the following must be performed: 1) preparation of a Phase II Investigation Work Plan, 2) implementation of an OER-approved Phase II Investigation, 3) preparation of a Phase II Investigation/Remedial Investigation report, and 4) preparation of an OER approved Remedial Action Work Plan.
- While the Noise E-Designation of the site is not considered a recognized environmental condition, in accordance with OER's requirements, prior to obtaining a building permit for redevelopment of the Site, a Noise Remedial Work Plan must be prepared and approved by OER.

## <u>Singer Environmental Group, LTD (SEG) review of Environmental Business Consultants (EBC)</u> <u>Phase I ESA, September 18, 2018</u>

- The Property (13-16 Beach Channel Drive Lot 6) was identified by the street address of 13-16 Beach Channel Drive and as Borough 4- Block 15528-Lot No. 6. The site was a portion of a larger residential property and developed with a small shed (center) from at least 1895. Between 1924 and 1933, the shed was demolished, and the property developed with the existing 3-story building, utilized as a residence, with a small, detached garage adjacent to the east. The garage was demolished in the late-1950's and the building partially converted for commercial use, with an animal hospital present by at least 1962. The animal hospital vacated the building circa 1990, with the building occupied by multiple commercial/retail and residential tenants since that time. The property is currently developed with a 3-story mixed use (commercial/residential) building, with a basement. The building is occupied by World Outreach Evangelical Ministry (basement) and six residential apartments.
- While no physical evidence of an underground storage tank (UST) was identified at the site, one ARA/LAA job is listed for the site for the installation of a new boiler and conversion from oil to gas. SEG recommended that clarification be made to identify the current heating system of the building, and an opinion be rendered on the former oil tank at the property.

#### <u>Singer Environmental Group, LTD (SEG) review of Tenen Environmental (Tenen) Phase I ESA,</u> September 21, 2018

- The Site (13-24 [Lot 9] to 13-30 Beach Channel Drive), Tax Block 15528, Lots 9, 12, and 112, is an irregularly shaped parcel on the east side of Beach Channel Drive. The total Site area is approximately 17,235 SF. The Site was developed with one-story commercial buildings, and occupied by a car wash, salon, barber, deli, and fast-food restaurant. Note, only Lot 9 is part of the proposed RIWP.
- Lot 9 was currently occupied by a car wash and has historically been identified by Sanborn maps as an "auto laundry." An existing subgrade oil-water separator is located on the south side of the building.
- The Site was listed on the EDR proprietary E-DESIGNATION database with E-designation E-232 for Air Quality HVAC fuel limited to natural gas, Window Wall Attenuation and Alternate Ventilation, and Hazardous Materials Phase I and Phase II Testing Protocol.
- Due to the fact that the site has an E-Designation for Hazardous Materials, in accordance with OER's (Office of Environmental Remediation) requirements, prior to obtaining a building permit for redevelopment of the Site, the following must be performed: 1) preparation of a Phase II Investigation Work Plan, 2) implementation of an OER-approved Phase II Investigation, 3) preparation of a Phase II Investigation/Remedial Investigation report, and 4) preparation of an OER approved Remedial Action Work Plan.
- While the Noise and Air E-Designation of the site is not considered a recognized environmental condition, in accordance with OER's requirements, prior to obtaining a building permit for redevelopment of the Site, a Noise and Air Remedial Work Plan must be prepared and approved by OER.

## <u>Tenen Environmental, LLC Due Diligence Phase II Environmental Site Investigation (ESI), August 2, 2018 (Lots 6, 9, 12, and 112):</u>

- As part of the investigation one (1) soil boring (SB-1) and one (1) temporary groundwater monitoring well (TW-1) were installed on Lot 6, and one (1) soil boring (SB-2) and one (1) temporary groundwater monitoring well (TW-2) were installed on Lot 9. The portions of the investigation conducted on Lots 12 and 112 are not relevant to this CPP.
- Fill material, containing sand, gravel, cobbles, brick, coal, and glass fragments, was
  encountered between one and three feet below grade (ft-bg) at the borings SB-1 and
  SB-2. The fill material was underlain by fine to coarse tan sand with some silt.
  Groundwater was encountered at approximately 17 ft-bg. The regional groundwater
  flow direction was determined to be to the northwest.

- The collected soil samples were analyzed for VOCs, SVOCs, and metals, while groundwater samples were analyzed for VOCs and SVOCs.
- No VOCs or SVOCs were detected in soil samples (collected from 0-2 fbg) at concentrations above applicable NYCRR Part 375 Protection of Groundwater (PGW) or Restricted Residential (RR) Soil Cleanup Objectives (SCOs). Of note, the VOC PCE was detected in SB-1 (0-2') but at concentrations below applicable PGW and RR SCOs.
- Tenen concluded that the metals detected in shallow soil samples could be attributed to "historic fill", while the PCE in groundwater sample TW-1 was likely attributed to "upgradient surrounding property usage."

#### Impact Environmental Closures (IEC) Partial Remedial Investigation (RI), October/November 2020

- Six (6) soil borings were installed to a terminal depth of 4-feet bgs, and samples were
  collected from two intervals: shallow interval from 0-2 feet bgs, and intermediate
  interval from 2-4-feet or 4-6-feet bgs. A total of 12 soil samples were analyzed by a NYS
  certified laboratory for NYCRR Part 375 List VOCs, SVOCs, metals, Polychlorinated
  Biphenyls (PCBs), and pesticides.
  - Concentrations of PCE were detected in shallow soil samples (2-4' bgs) in one (1) soil sample located on the southern portion of the Site (Lot 5) at levels above the NYSDEC Part 375 Protection of Groundwater (PGW) Soil Cleanup Levels (SCOs). Concentrations of several heavy metals, such as lead, mercury, and zinc, were detected in shallow soil samples (0-2' and 2-4' bgs) in four (4) soil sampled located across the Site at levels above the NYSDEC Part 375 PGW and Restricted Residential (RR) SCOs. Several Poly Aromatic Hydrocarbon (PAH) SVOCs were detected in one (1) shallow soil sample (2-4' bgs) on the southern portion of the Site, at concentrations in exceedance of their respective NYSDEC Part 375 PGW and RR SCOs.
- Three (3) permanent and one (1) temporary groundwater monitoring wells designated MW-1, MW-2, MW-3, and TWP-1 were installed. Estimated groundwater depth was approximately 17-feet bg. Each well was screened from between 15-25-feet bgs. A total of four (4) groundwater samples were analyzed by a NYS certified laboratory for NYCRR Part 375 List VOCs, SVOCs, metals, PCBs, and pesticides. The VOC PCE was detected in three (3) groundwater samples collected from across the Site at concentrations in exceedance of their respective 6 NYCRR Part 703.5 Ambient Water Quality Standards (AWQS). The highest concentration of PCE (240 μg/m³) was detected in a groundwater sample collected from within the northwest corner of the Site. Several SVOCs were also detected in a single groundwater sample, located on the southern portion of the Site, in exceedance of their respective NYSDEC AWQS. Finally, the heavy metals manganese was detected in a filtered groundwater sample collected from the southern portion of the Site, in exceedance of the NYSDEC AWQS.

- The three (3) permanent groundwater monitoring wells were surveyed to determine the approximate groundwater flow direction. The results of the survey indicated groundwater is flowing towards the north-northwest.
- Six (6) soil vapor probes were installed across the site to determine soil vapor conditions below the proposed building footprint. Soil vapor probes were installed between 3-5-feet below grade. A total of six (6) soil vapor samples were analyzed by a NYS certified laboratory for United States Environmental Protection Agency (USEPA) TO-15 List VOCs.

Based on the results of the soil vapor samples, PCE was detected in soil vapor samples at concentrations ranging from  $88.2 \, \mu g/m^3$  to  $15,800 \, \mu g/m^3$ . The highest concentrations of PCE in soil vapor were found in the southwestern corner of the Site (Lot 5). In addition, elevated concentrations of TCE were detected in one soil vapor sample, located on the southeastern portion of the Site, at a concentration of  $2.42 \, \mu g/m^3$ .

#### 5. Investigation and Cleanup Process

#### **Application**

The Applicant has applied for 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 proposes that the site will be used for mixed commercial and residential purposes.

To achieve this goal, the Applicant will conduct investigation and cleanup 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 has completed a "partial" site investigation before it entered into the BCP. For the partial investigation, NYSDEC will determine if the data are useable. The NYSDEC has requested a full Remedial Investigation of the Site be performed to supplement the initial partial 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 must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

- 1) define the nature and extent of contamination in soil, groundwater, soil vapor, 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 submits a draft "Remedial Investigation Work Plan" to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

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 (FER). 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):

Chris Allan, Project Manager NYSDEC Region 2 Division of Environmental Remediation 47-40 21st Street, Long Island City, NY 11101-5401

Phone: (718) 482-4065

Email: cristopher.allan@dec.ny.gov

Thomas Panzone
Public Participation Specialist
NYSDEC Region 2
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101

Phone: (718) 482-4953

Email: <a href="mailto:Thomas.panzone@dec.ny.gov">Thomas.panzone@dec.ny.gov</a>

10:00 am- 5:00 pm

Eamonn O'Neil Project Manager NYSDOH Empire State Plaza - Corning Tower Room #1787Albany, NY 12237

Phone: 5180402-7860

Email: eamonn.oneil@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:

Saturday:

Sunday: Closed Queens Public Library – Central Branch 10:00 am- 5:00 pm Monday: 89-11 Merrick Boulevard Tuesday: 1:00 pm- 5:00 pm Jamaica, NY 11432 Wednesday: 10:00 am-5:00 pm Attn: Judith Todman or Yusheng Nelson Thursday: 12:00 pm- 7:00 pm Phone: (718) 990-8585 Friday: 10:00 am- 5:00 pm Hours:

Queens Community Board 14 1931 Mott Avenue Far Rockaway, NY 11619

Attn: Jonathan Gaska Phone: (718) 471-7300

Hours:

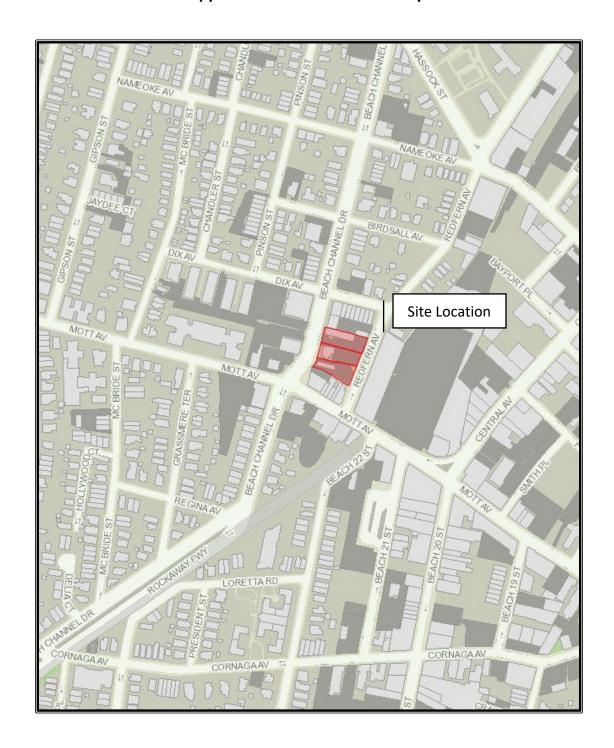
8:00am-4:00pm

NYSDEC Region 2 Division of Environmental Remediation 47-40 21st St Long Island City, NY 11101

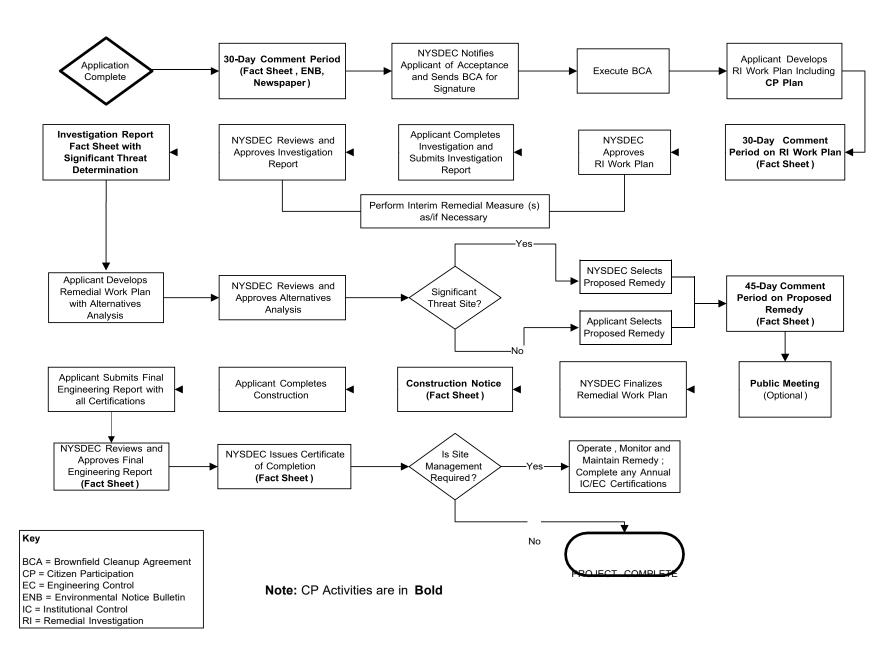
### Appendix B - Site Contact List

| Hon. Scott Stringer                            | 13-12, 13-16, 13-24 Beach Channel D<br>Title                 | rive, Queens, NY 11691 Address                       | City                        | State | _     |
|--|--|--|-----------------------------|-------|-------|
| Hon. Scott Stringer                            |  | Address  | City                        | Ctata |       |
| -  |  |  |                             |       | Zip   |
| Hon luumane Williams                           | NYC Comptroller  | 1 Centre Street                                      | New York                    | NY    | 10007 |
|  | Public Advocate  | 1 Centre Street                                      | New York                    | NY    | 10007 |
|  | Office of Environmental Assessment & Planning NYCDEP         | 96-05 Horace Harding Expressway                      | Flushing                    | NY    | 11373 |
| ·  | Queens County Clerk  | 88-11 Sutphin Boulevard Room 106                     | Jamaica                     | NY    | 11435 |
| , ·  | NYC Office of Environmental Remediation                      | 100 Gold Street - 2nd Floor                          | New York                    | NY    | 10038 |
|  | U.S Senator  | 780 Third Avenue, Suite 2301                         | New York                    | NY    | 10017 |
|  | U.S Senator  | 780 Third Avenue, Suite 2601                         | New York                    | NY    | 10017 |
|  | Director of NYS Office of Planning and Development (NYSDOS)  | 99 Washington Avenue Suite 1010                      | Albany                      | NY    | 12231 |
| <u> </u>                                       | U.S. House of Representatives, 14th District                 | 67-12 Rockaway Beach Boulevard                       | Arverne                     | NY    | 11692 |
|  | New York State Senator, 10th District                        | 142-01 Rockaway Boulevard                            | South Ozone Park            | NY    | 11436 |
|  | Queens County Burough President                              | 120-55 Queens Boulevard                              | Kew Gardens                 | NY    | 11424 |
|  | NYS Assemblyman  | 19-31 Mott Avenue, Room 301                          | Far Rockaway                | NY    | 11691 |
|  | NYC Planning Board Chair                                     | 120-55 Queens Boulevard                              | Kew Gardens                 | NY    | 11424 |
|  | Mayor of the City of New York                                | City Hall  | New York                    | NY    | 10007 |
|  | Commisioner of the Queens Department of City Planning        | 120 Broadway-31st Floor                              | New York                    | NY    | 10271 |
|  | Queens Community Board 14 - District manager                 | 1931 Mott Avenue                                     | Far Rockaway                | NY    | 11691 |
|  | Queens Community Board 14 - Chairwoman                       | 1931 Mott Avenue                                     | Far Rockaway                | NY    | 11691 |
|  | Queens Community Board 14 - Environmental Committee Chairman | 1931 Mott Avenue                                     | Far Rockaway                | NY    | 11691 |
| The Wave, Newspaper                            | Media Outlet   | P.O Box 9300097                                      | Rockaway Beach              | NY    | 11694 |
| New York Daily News                            |  | 4 New York Plaza                                     | New York                    | NY    | 10004 |
| New York Post                                  |  | 1211 Avenue of the Americas                          | New York                    | NY    | 10036 |
| Spectrum NY 1 News                             |  | 75 Ninth Avenue                                      | New York                    | NY    | 10011 |
| The Rockaway Times                             |  | 114-04 Beach Channel Drive                           | Rockaway                    | NY    | 11694 |
| Hoy Nueva York                                 |  | 15 Metrotech Center Floor 7                          | Brooklyn                    | NY    | 11201 |
| El Diario La Prensa                            |  | 15 Metrotech Center Floor 7                          | Brooklyn                    | NY    | 11201 |
| Richard David - Director                       | Consolidated Edison Corporate Affairs                        | 59-17 Junction Boulevard                             | Elmhurst                    | NY    | 11373 |
|  | 101 NYPD Police Precinct Council                             | 16-12 Mott Avenue                                    | Far Rockaway                | NY    | 11691 |
|  | FDNY   | 16-19 Central Avenue                                 | Far Rockaway                | NY    | 11691 |
|  | Queens Public Library at Far Rockaway, Branch Administrator  | 1003 Beach 20th Street                               | Far Rockaway                | NY    | 11691 |
|  | middle school 53, principal                                  | 10-45 Nameoke Street                                 | Far Rockaway                | NY    | 11691 |
|  | PS 253, Principal  | 1307 Cental Avenue                                   | Far Rockaway                | NY    | 11691 |
|  | Peninsula Perperatory academy, Principal                     | 611 beach 19th street                                | Far Rockaway                | NY    | 11691 |
| Charmaine Jean-Baptiste                        | Church of God Christian Academy, Principal                   | 1332 central ave                                     | Far Rockaway                | NY    | 11691 |
| '  |  |  | ,                           |       |       |
| -  | Challenge Charter Middle School, Principal                   | 12-79 Redfern Ave                                    | Far Rockaway                | NY    | 11691 |
| Michelle Charles                               | Kids time Child Care   | 10-50 Beach 22nd Street                              | Far Rockaway                | NY    | 11691 |
|  | Sunshine Day care  | 13-81 McBride Street                                 | Far Rockaway                | NY    | 11691 |
|  | Kennedi's Playhouse WeeCare                                  | 1812 Everdell Avenue                                 | Far Rockaway                | NY    | 11691 |
| , . ,  | Faces of Grace Family Daycare                                | 1120 Gipson Street                                   | Far Rockaway                | NY    | 11691 |
| •  | Brilliant Minds Group Family Daycare, LLC                    | 13-49 Gipson Street                                  | Far Rockaway                | NY    | 11691 |
| ,  | Abbys Fun House Group Family Daycare                         | 1365 Eggert Place                                    | Far Rockaway                | NY    | 11691 |
| Gibbs, Latisha L                               | Toy Story Day Care   | 23-18 Enright Road                                   | Far Rockaway                | NY    | 11691 |
| Bobb, Joan                                     | Tiny Tikes Day Care  | 1061 Gipson Street                                   | Far Rockaway                | NY    | 11691 |
| Fulwood, Yvonne A                              | Lovable Kids Day Care  | 1070 Dickens Street                                  | Far Rockaway                | NY    | 11691 |
| Daniels, Gloria                                | Little Treasures Day Care                                    | 1418 Mott Avenue                                     | Far Rockaway                | NY    | 11691 |
| Siach Yitzchok                                 | Reishi's Chochma Pre-School                                  | 9-15 Dinsmore Avenue                                 | Far Rockaway                | NY    | 11691 |
| Johnson, J. Patricia                           | Our Precious Angels  | 2402 Ocean Crest Boulevard                           | Far Rockaway                | NY    | 11691 |
| Coleman, McKinley                              | Clouds of Joy Day Care                                       | 11-36 Neilson Street                                 | Far Rockaway                | NY    | 11691 |
| Louis, Ralph S                                 | Thinkers of Tomorrow Daycare                                 | 14-40 Eggert Place                                   | Far Rockaway                | NY    | 11691 |
| ·  | Rockaway Child Care Center                                   | 14-66 Beach Channel Drive                            | Far Rockaway                | NY    | 11691 |
| Miss D's Playgroup Daycare                     | ·  | 15-26 Central Avenue                                 | Far Rockaway                | NY    | 11691 |
|  | Kevin W. Alexander - President and CEO                       | 1920 Mott Avenue                                     | Far Rockaway                | NY    | 11691 |
| Rockaway Waterfront Alliance                   |  | PO box 900645  | Far Rockaway                | NY    | 11690 |
| ·  | Executive Director   | 821 Bay 25th Street Room 149C                        | Far Rockaway                | NY    | 11691 |
| Margert Community Corporation                  | Executive Director   | 325 Beach 37th Street                                | Far Rockaway                | NY    | 11691 |
|  | St. Johns Episcopal Hospital                                 | 327 beach 19th street                                | Far Rockaway                | NY    | 11691 |
| -  | Adjacent Property owner of 13-26 Beach Channel Drive         | 3008 Avenue J  | <del>-</del>                | NY    | 11091 |
|  | <u> </u>   | 2115 Dix Avenue                                      | Brooklyn<br>Far Rockaway    | NY    | 11210 |
|  | Adjacent Property owner of 21-15 Dix Avenue                  |  | Far Rockaway                |       |       |
|  | Adjacent Property owner of 21-11 Dix Avenue                  | 2265 28th Street                                     | Long Island City            | NY    | 11105 |
|  | Adjacent Property owner of 18-12 Redfern Avenue              | 453 Beach 43rd Street                                | Far Rockaway                | NY    | 11691 |
|  | Adjacent Property owner of 21-46 Mott Avenue                 | 3008 Avenue J  | Brooklyn                    | NY    | 11210 |
|  | Adjacent Property owner of 21-44 Mott Avenue                 | 63 Durland Road                                      | Lynbrook                    | NY    | 11563 |
| Gus Markides, Trustor                          | Adjacent Property owner of 21-40 Mott Avenue                 | 63 Durland Road                                      | Lynbrook                    | NY    | 11563 |
|  | Site Contact Li  | st   |                             |       |       |
|  | 13-12, 13-16, 13-24 Beach Channel D                          | rive, Queens, NY 11691                               |                             |       |       |
| Name   | Title  | Address  | City                        | State | Zip   |
|  | Adjacent Property owner of 21-38 Mott Avenue                 | 21-38 Mott Avenue                                    | Far Rockaway                | NY    | 11691 |
| 2138 Mott Avenue Realty Co                     | · · ·  |  |                             |       | 11758 |
|  |  | 288 N. Oak Street                                    | Massapegua                  | NY    | 11/20 |
| 2136 Mott Ave Holding                          | Adjacent Property owner of 21-36B Mott Avenue                |  | Massapequa<br>Oceanside     | NY    | 11572 |
| 2136 Mott Ave Holding<br>2136 Mott Ave Holding |  | 288 N. Oak Street 613 Patten Ave 173 Harrison Street | Massapequa Oceanside Leonia |       |       |

Appendix C - Site Location Map



## **Appendix D- Brownfield Cleanup Program Process**



# Appendix D

Health and Safety Plan

Remedial Action Work Plan

NYSDEC BCP #C241254



# **Construction Health and Safety Plan**

December 10, 2021

conducted at:

13-16 Beach Channel Drive 13-12, 13-16 and 13-24 Beach Channel Drive Far Rockaway, New York Block 15528 Lots 5,6, and 9 NYSDEC BCP Site No. C241254

prepared for:

BCD Owner LLC 419 Park Avenue South, 4<sup>th</sup>floor New York, New York

submitted to:

New York State Department of Environmental Protection Region 2 Division of Environmental Remediation 47-40 21st Street Long Island City, NY 11101

**IE Project # 15209** 



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## 1 Introduction

This Construction Health and Safety Plan (CHASP) describes the procedures to be followed in order to reduce employee exposure to potential health and safety hazards that may be present during environmental remedial activities being performed at the site. The emergency response procedures necessary to respond to such hazards are also described within this CHASP. All activities performed under this CHASP are targeted to comply with Occupational Safety and Health Administration (OSHA) Regulations 29 CFR Part 1910.1025.

This document is not, nor does it purport to be, a complete description of all safety and health requirements applicable to work performed at the site. Rather, the CHASP is a general overview of the compliance policies and work practices applicable to the primary tasks and hazards associated with the environmental assessment portion of the development project, as well as a recitation of minimum safety and health compliance obligations for contractors, subcontractors and workers at the site. All subcontractors of any tier operating at the worksite are obligated to implement and maintain comprehensive safety and health plans for their own employees and to ensure that their employees comply with all applicable safety and health requirements. All subcontractors operating at the worksite should refer to the applicable specific OSHA Standards for detailed requirements.

## 1.1 Purpose

The purpose of this CHASP is to provide the contractors' field personnel, as well as other site-occupants, with an understanding of the potential chemical and physical hazards that exist or may arise while portions of this project are being performed. To this end, this CHASP also presents information on the progression of the environmental restoration activities and specific details regarding the handling of materials excavated from the site.

The primary objective is to ensure the well being of all field personnel and the community surrounding this site. In order to accomplish this, project staff and approved subcontractors of any tier shall acknowledge and adhere to the policies and procedures established herein. Accordingly, all personnel assigned to the remediation activities associated with this project (Remedial Personnel) shall read this CHASP and sign the Agreement and Acknowledgment Statement (**Appendix A**) to certify that they have read, understood, and agree to abide by its provisions. A copy of this CHASP will be available to anyone that requests it. Personnel involved in construction activities (Construction Personnel) and other Personnel (e.g. government officials, administrators, bank inspectors, assessors, etc.) that will have limited exposure to the site native soil/fill material during construction activities will be instructed on how to reduce the probability of exposure to site contaminants, but will not be required read the CHASP.

## 2 Application of Health and Safety Plan

The procedures of this CHASP apply for any person that will enter the boundaries of the site or a portion of the Site during environmental remediation activities or construction, until the existing soil/fill material has been covered with either a paved surface or an uncontaminated soil cap. When the Project Manager has designated an area of the site as clear of any environmental issues, construction contractors and subcontractors of any tier will perform the balance of the work in accordance with their individual OSHA-compliant corporate CHASP.

#### 2.1 Restoration Personnel

Employees of contractors and subcontractors of any tier performing the following activities will be considered Restoration Personnel:

- Excavation of native soil/fill material
- Loading of native soil/fill onto vehicles
- Processing of native soil/fill into components
- Transporting of native soil/fill across the site
- Sampling of native soil/fill material for subsequent physical or chemical analysis
- Cleaning or decontaminating equipment or personnel
- Handling of ground waters

All subcontractors, of any tier, must submit a CHASP to the Site Health and Safety Officer for review and approval prior to mobilizing to the site. Only CHASPs that comply with this CHASP will be approved. Where a subcontractors CHASP is deficient, the Site Health and Safety Officer will provide written notification of any required changes. Approved CHASPs will be submitted to the Project Manager and retained on-site for reference by the Site Health and Safety Officer.

#### 2.1.1 Construction Personnel

For this document, "Construction Personnel" is the term given for those employees of contractors and subcontractors of any tier performing activities associated with site development other than those performed by the Remedial Personnel. This designation does not preclude that Construction Personnel will traverse or work upon native soil/fill material, rather, it infers that it will not involve performing tasks that will create a route of exposure to the contaminants contained therein. Construction Personnel will receive instruction to limit the potential for exposure to these contaminants. Construction Personnel will be prohibited from entering

Environmental Remediation Areas (i.e., active excavation / handling / processing areas, loading areas, exclusion zones or support zones).

## 3 Key Personnel / Identification of Health & Safety Personnel

## 3.1 Key Personnel

A list of the pertinent personnel authorized to be present on site is as follows:

| <u>Title</u>                                       | Name                 | Telephone Number                              |
|--|----------------------|---|
| Senior Project Manager Impact Environmental        | Greg Mendez-Chicas   | (O) 631-269-8800 ext: 124<br>(C) 631-252-5480 |
| Project Manager  Impact Environmental              | Christopher Connolly | (O) 631-269-8800 ext: 152<br>(C) 631-664-4425 |
| Field Operations Leader  Impact Environmental      | Dan Fruhauf          | (O) 631-269-8800 ext: 141<br>(C) 631-401-2470 |
| Site Health & Safety Officer  Impact Environmental | Alex Keenan          | (O) 631-269-8800 ext: 161<br>(C) 516-301-0675 |

## 3.2 Organizational Responsibility

## 3.2.1 Senior Project Manager

The Senior Project Manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties will include:

- Selecting a Site Health and Safety Officer and field personnel for the work to be undertaken on site;
- Providing authority and resources to ensure that the Site Health and Safety Officer is able to implement and manage safety procedures;

- Preparing reports and recommendations about the project to clients and affected personnel;
- Ensuring that all persons allowed to enter the site (e.g.., EPA, contractors, state officials, visitors) are made aware of the potential hazards associated with the substances known or suspected to be on site, and are knowledgeable as to the on-site copy of the specific CHASP; and
- Ensuring that the Site Health and Safety Officer is aware of all of the provisions of this CHASP and is instructing all personnel on site about the safety practices and emergency procedures defined in the plan.

## 3.2.2 Project Manager

The Project Manager will be responsible for implementing the Senior Project Manager' duties as well as oversee activities regarding the project both in the field and in the office as well as interact with environmental regulatory agencies, sub-contractors and internal company personnel.

- Coordinating the activities of all construction and Remedial Personnel, to include informing them of the required Personal Protective Equipment (PPE) and insuring their signature acknowledging this CHASP;
- Ensuring that the tasks assigned are being completed as planned and on schedule; and
- Serving as liaison with public officials where there is no Public Affairs official designated.

#### 3.2.3 Field Operations Leader

The Field Operations Leader will be responsible for field operations and safety. Specific duties will include, but are not limited to:

- Scheduling with the construction company and their subcontractors;
- Coordinating with the Site Health and Safety Officer in determining protection levels;
- Documenting field activities;
- Coordinate activities between environmental and construction personnel;
- Coordination with waste management contractors; and
- Review and approval of waste disposal facilities.

In the event that the Project Manager and the Site Health and Safety Officer are not on site, the Field Operations Leader will assume all responsibility of the Site Health and Safety Officer.

## 3.2.4 Site Health and Safety Officer

The Site Health and Safety Officer shall be responsible for the implementation of the CHASP on site. Specific duties will include:

- Monitoring the compliance of construction and environmental remediation activities personnel (field personnel) for the routine and proper use of the PPE that has been designated for each task;
- Routinely inspecting PPE and clothing to ensure that it is in good condition and is being stored and maintained properly;
- Stopping work on the site or changing work assignments or procedures if any operation threatens the health and safety of workers or the public;
- Monitoring personnel who enter and exit the site and all controlled access points;
- Reporting any signs of fatigue, work-related stress, or chemical exposures to the Project Manager;
- Dismissing field personnel from the site if their actions or negligence endanger themselves, coworkers, or the public, and reporting the same to the Project Manager;
- Reporting any accidents or violations of the CHASP plan to the Project Manager and documenting the same for the project in the records;
- Knowing emergency procedures, evacuation routes, and the telephone numbers of the ambulance,
   local hospital, poison control center, fire and police departments;
- Ensuring that all project-related personnel have signed the personnel agreement and acknowledgments form contained in this CHASP; and
- Coordinate upgrading and downgrading PPE as necessary due to changes in exposure levels, monitoring results, weather, and other site conditions.

## 4 Chemical Hazard Analysis and Control Measures

Based on the Phase II Environmental Site Assessment and Remedial Investigation performed at the site, the contaminants of concern include the following:

- CVOC's
- VOC's
- SVOCs
- Metals

Chlorinated volatile organic compounds (CVOCs) and Volatile organic compounds (VOC's) were found in soil, groundwater, and soil vapor. SVOCs and Metals were found in soil and groundwater. A summary of the health hazards associated with the contaminant of concerns are shown below.

## 4.1 CVOCs, VOC's and SVOCs

The Phase II Environmental Site Assessment and Remedial Investigation performed at the site have identified the CVOCs VOC's and metals in soil, groundwater, and soil vapor.

Soil vapor sampling results indicate that tetrachloroethene (PCE) and trichloroethene (TCE) were detected in all sampling points at concentrations above the respective New York State Department of Health (NYSDOH) Indoor/Outdoor Air Guidance Values. Additionally, trace concentrations of cis-1,2-dichloroethene,2-butanone, 1,1,1-TCE, toluene, 2-hexanone,o-xylene and 1,2,4-Trimethylbenzene were present in the soil vapor samples.

A hotspot source area of PCE/TCE contamination was identified during the Remedial Investigation located in the southern portion of the Site (Lot 5) in which PCE and TCE were detected at concentrations above Industrial Use Soil Cleanup Objectives at depths ranging from 0-8 feet below grade. Shallow depth soil samples also contained concentrations of the SVOC benzo (a) anthracene, benzo(a)pyrene, benzo(b) fluoranthene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene at concentrations above UUSCOs.

The VOCs chloroform, PCE, and TCE were detected at concentrations exceeding the NYSDEC Ambient Water Quality Standards (AWQS) in several groundwater samples. Groundwater samples also displayed concentrations of several Polycyclic Aromatic Hydrocarbon (PAH) SVOCs above the AWQS.

Possible routes of exposure include inhalation, ingestion, and absorption. Prolonged exposure to CVOCs/VOCs above their respective OSHA permissible exposure limits may result in irritation of the mucous membranes of the respiratory system, eyes, and mouth. Overexposure to CVOCs/VOCs may also result in the depression of the central nervous system. Symptoms may include drowsiness, headache, and fatigue.

#### 4.2 Metals

The Phase II Environmental Site Assessment and Remedial Investigation performed at the site have identified metals in soil and groundwater. During the Remedial Investigation Lead and mercury was detected above Part 375 Unrestricted Use SCOs (UUSCOs) in one shallow soil sample. Several soil samples contained detectable concentrations of arsenic, barium, beryllium, chromium (total) copper (total), lead, manganese, mercury, selenium zinc and cyanide, lead and mercury. These concentrations may be indicative of the former use of the Site or related to the Site being in a coastal zone. Additionally, iron, magnesium, manganese, sodium, chromium (total) arsenic, iron, lead and thallium were detected above the NYSDEC AWQS in groundwater in water samples, both locally (arsenic, magnesium and lead) and Site wide. Possible routes of exposure include inhalation and ingestion. Metals exposure, generally in the form of soil/fill material dust, may cause skin, eye, or mucous membrane irritation. Exposure symptoms may include headaches, nausea, vomiting, abdominal pain, aches, and dizziness.

## 5 Health and Safety Risk Analysis

The field tasks covered by the CHASP will include material excavation with hydraulic equipment and hand tools, the manual sorting of materials, and containerization of soil and groundwater samples. Additionally, standard job task hazards that are inherent to a construction project will exist.

## 5.1 Explosion and Fire

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to explosion and fire. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Fire Protection and Prevention Standard, set forth at 29 C.F.R. § 1910 part 1926.35, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations. The following are possible fire and explosion hazards that may be encountered on the job site along with fire preventive measures to take.

#### 5.1.1 Flammable Vapors

The presence of flammable vapors can pose a potential fire and health hazard. Hazard reduction procedures include monitoring the ambient air with an oxygen/LEL meter (combustible gas indicator). If the LEL reading exceeds 20%, all work will stop and employees will leave the site immediately and contact the fire department. For OSHA-defined "confined space" activities, work will stop if the LEL reading exceeds 10%.

## 5.1.2 High Oxygen Levels

Atmospheres that contain a level of oxygen greater than 23% pose an extreme fire hazard (the usual ambient oxygen level is approximately 20.5%). All personnel encountering atmospheres that contain a level of oxygen greater than 23% must evacuate the site immediately and must notify the Fire Department. If the oxygen level is less than 19.5%, do not enter the space without level B PPE.

#### 5.1.3 Fire Prevention

- During equipment operation, periodic vapor concentration measurements should be taken with an
  explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of the lower explosive
  limit (LEL), then the Site Health and Safety Officer or designated field worker should immediately shut down all
  operations.
- Only approved safety cans will be used to transport and store flammable liquids.

- All gasoline and diesel-driven engines requiring refueling must be shut down and allowed to cool prior to filling.
- Smoking is not allowed during any operations within the work area in which petroleum products or solvents in free-floating, dissolved, or vapor forms, or other flammable liquids may be present.
- No open flame or spark is allowed in any area containing petroleum products or other flammable liquids.

## 5.2 Operational Safety Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to earth moving equipment. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Excavation Standard, set forth at 29 C.F.R. § 1910 Subpart P as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

## 5.2.1 Heavy Machinery / Equipment

All site employees must remain aware of those site activities that involve the use of heavy equipment and machinery. Respiratory protection and protective eyewear may be worn frequently during site activities. This protective equipment significantly reduces peripheral vision of the wearer. Therefore, it is essential that all employees at the site exercise extreme caution during operation of equipment and machinery to avoid physical injury to themselves or others.

## 5.2.2 Vehicular Traffic

All employees will be required to wear a fluorescent safety vest at all times while on site. In addition, supplemental traffic safety equipment use can be exercised when warranted by specific task. Supplemental equipment can be items such as cones, flags, barricades, and/or caution tape. Drivers of waste transportation vehicles will only exit vehicles in designated areas within the Support Zone. During this time, drivers will only be allowed to inspect the placement of waste loads and cover their trailers.

#### 5.3 Noise Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to noise hazards. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Occupational Noise Exposure Standard, set forth at 29 C.F.R. § 1910 part 1926.52, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Hearing protection shall be provided to the employees where sound pressure levels exceed 85 dB. Hearing protection shall be worn where sound pressure levels in areas and/or on equipment exceeds 90 dB. Typical heavy excavation operations have been monitored with a sound level meter and indicate that hearing protection is required for all personnel while engaged in this action.

## 5.4 Safe Material Handling

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to safe material (soil/fill) handling. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Eye and Face, and Respiratory Safety Standards, set forth at 29 C.F.R. § 1910 Parts 1926.102 and 1926.103 as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Skin and eye contact with contaminated soil/fill or materials in contact with the soil/fill may occur during excavation, handling and decontamination activities. Nitrile gloves and approved safety glasses must be worn to prevent exposure to the associated contaminants. Employees working at or near (within ten feet of) excavation fronts could be required to wear respiratory protection. If necessary, all associated activities will be performed pursuant to 29 C.F.R. § 1910 Parts 1926.134 (a)(2) and 1926.55.

## 5.5 Temperature Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to temperature stresses. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Technical Manual (TED 1-0.15A), Section III – Chapter 4 (1999) as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Since climatic changes cannot be avoided, work schedules will be adjusted to provide time intervals for intake of juices, juice products, and water in an area free from contamination and in quantities appropriate for fluid replacement to prevent heat stress conditions from occurring.

## 5.5.1 Types of Heat Stress

Heat stress may occur even in moderate temperature areas and may present any or all of the following:

## 5.5.1.1 Heat Rash

Result of continuous exposure to heat, humid air, and chafing clothes. Heat rash is uncomfortable and decreases the ability to tolerate heat.

#### 5.5.1.2 Heat Cramps

Result of the inadequate replacement of body electrolytes lost through perspiration. Signs include severe spasms and pain in the extremities and abdomen.

## 5.5.1.3 Heat Exhaustion

Result of increased stress on the vital organs of the body in the effort to meet the body's cooling demands. Signs include shallow breathing; pale, cool, moist skin; profuse sweating; and dizziness.

#### 5.5.1.4 Heat Stroke

Result of overworked cooling system. Heat stroke is the most serious form of heat stress. Body surfaces must be cooled and medical help must be obtained immediately to prevent severe injury and/or death. Signs include red, hot, dry skin, absence of perspiration, nausea, dizziness and confusion, strong, rapid pulse that could lead to coma or death.

#### 5.5.2 Heat Stress Prevention

- A. Replace body fluids (water and electrolytes) lost through perspiration. Solutions may include a 0.1% salt and water solution or commercial mixes such as "Gatorade". Employees must be encouraged to drink more than the amount required in order to satisfy thirst.
- B. Use cooling devices to aid the natural body ventilation. Cooling occurs through evaporation of perspiration and limited body contact with heat-absorbing protective clothing. Utilize fans and air conditioners to assist in evaporation. Long, cotton underwear is suggested to absorb perspiration and limit any contact with heat-absorbing protective clothing (i.e., coated Tyvek suits).
- C. Conduct non-emergency response activities in the early morning or evening during very hot weather.
- D. Provide shelter against heat and direct sunlight to protect personnel. Take breaks in shaded areas.
- E. Rotate workers utilizing protective clothing during hot weather.
- F. Establish a work regime that will provide adequate rest periods, with personnel working in shifts.

#### 5.6 Cold Exposure Hazards

If work is performed continuously in the cold at or below -7 °C (20 °F), including wind chill factor, heated warming shelters (tents, cabins, company vehicles, rest rooms, etc.) shall be made available nearby and the worker should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing.

Dehydration, or the loss of body fluids, occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect (adapted from TLV's and Biological Exposure Indices 1988-1989, ACGIH).

#### 5.7 Community Air Monitoring Program (CAMP)

Real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary during the Remedial Investigation as Per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.

- 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.

- 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.
- 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.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) 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/m3 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/m3 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/m3 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.

## 4 Personnel Training

## 4.1 Pre-assignment and OSHA Training

All Remedial Personnel that will be in direct contact (that is hand digging, sampling, processing) with the native soil/fill materials must complete an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and, where necessary, a current eight hour refresher course (as required annually after initial 40-hour training completion). Restoration Personnel that will not be in direct contact with native soil/fill materials are only required to prove they have read and understood the procedures presented in this HASP.

On-site managers and supervisors of Restoration Personnel (Field Operations Leader, Site Health and Safety Officer) directly responsible for employees engaged in hazardous substance operations have received an initial 40-hour HAZWOPER training course. These training requirements comply with the OSHA Hazardous Waste Operations and Emergency Response Regulation, 29 CFR 1910.120.

The Site Health and Safety Officer will conduct an on-site training meeting for all Construction Personnel and observers that could potentially be exposed to the native soil/fill material during construction activities. Training meetings will be provided routinely for any new project personnel. This program will cover specific health and safety equipment and protocols and potential problems inherent to each project operation. The Site Health and Safety Officer will be present for any activities being performed by Construction Personnel that will involve the handling of soil/fill during construction activities to provide supervision on exposure reduction. This may include insuring the use of proper PPE and air quality monitoring.

## 4.2 Respirator Requirements

#### 4.2.1 Respirator Requirements and Fit Testing

The OSHA respiratory protection standard, 29 CFR 1910.134, under paragraph (f)(2), requires fit testing for all employees using tight fitting respirators including filtering facepiece respirator. The fit test must be performed before the respirator is used and must be repeated at least annually and whenever a different respirator facepiece is used or a change in the employee's physical condition could affect the respirator fit.

The user seal check is a separate requirement under paragraph (g)(1)(iii) and must be performed each time the employee dons the respirator. Employers must adhere to the recommendations of the respirator's manufacturer; different manufacturers recommend different procedures.

## 4.2.2 Medical Surveillance

OSHA requires a medical evaluation to determine whether each employee required to wear a respirator is physically able to wear a respirator and perform the work. This evaluation can be a medical examination or an evaluation of employee responses to the OSHA Respirator Medical Evaluation Questionnaire located in **Appendix**B. Either method must be performed by a physician or other licensed healthcare professional. A medical examination may be necessary whenever the employee gives a positive response to any of questions 1 through 8 in Appendix B, Part A, Section 2.

## 5 Personal Protective Equipment

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to personal protective equipment. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Personal Protective Equipment Standard, set forth at 29 C.F.R. § 1910.Part 1926.28(a) as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

The purpose of personal protective clothing and equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered on-site when engineering and other controls are not feasible or cannot provide adequate protection. Careful selection and use of adequate PPE should protect the health of all on-site workers. No single combination of PPE is capable of protecting against all hazards. Therefore, PPE should be used in conjunction with, not in place of, other protective methods, such as engineering controls and safe work practices.

Site-specific chemicals of concern include semi-volatile organic compounds. These chemicals are of moderate to low hazard. Therefore, level D personal protective equipment will be required at all times when on site. The following is a breakdown of the types of protective clothing and equipment to be used during the site activities.

## 5.1.1 Levels of Protection

The Site Health and Safety Officer will determine whether a level of protection should be upgraded or downgraded. Changes in the level of protection will be recorded in the dedicated site logbook along with the rationale for the changes (see Section 7.1.3 for additional information on PPE upgrades). Level D PPE will be the minimum requirement at all times during the environmental remediation portion of the project.

## 5.1.2 Level D Personal Protective Equipment

All initial site access and activities will be done in Level D attire. Level D protection is sufficient under conditions where no contaminants are present or those activities that do not pose a potential threat of unexpected inhalation of or contact with hazardous levels of any substances. Typical Level D activities may include sediment, logging and groundwater sampling, and as surficial site surveys.

- Hard hat
- Safety glasses (as appropriate)
- Steel toe and shank boots
- Fluorescent vest
- Hearing protection (as appropriate)

#### 5.1.3 Modified Level D Personal Protective Equipment

- Hard hat
- Safety glasses
- Steel toe and shank boots
- Fluorescent vest
- Nitrile "N-Dex" inner gloves
- Latex outer boots (chemical resistant)
- Polyethylene coated Tyvek suit
- Hearing protection (as appropriate)

## 5.1.4 Level C Personal Protective Equipment

Level C protection, as described in this plan, will be available at a minimum for those activities that involve surface and subsurface soil (strata disturbance such as well installation, and all subsurface media sampling activities such as split-spoon sampling and borings). Level C protection equipment should be readily available at all times.

Consistent with OSHA training, prior to donning Level C, oxygen percent must be continuously monitored.

- Buddy system required at all times
- Full face respirator with NIOSH approved OV/AG/HEPA combination cartridges (MSA GMC-H)
- Saranex coated Tyvek Suit
- Inner Nitrile "N-Dex" gloves
- Outer Nitrile (NBR) gloves
- Steel toe and shank boots
- Outer boots (chemical resistant)
- Hard hat

• Hearing protection (as appropriate)

#### 5.1.5 Level B Personal Protective Equipment

Some activities may require Level B protection. In atmospheres potentially containing toluene and xylenes, the protective ensemble should include chemical resistant clothing since the two compounds have skin absorption potential.

Regional Health and Safety representatives must be on site upon start-up of <u>any</u> project requiring level B protection. This should be understood to include subcontractors conducting Level B activity.

- Buddy system required at all times
- Supplied air respirator or SCBA
- Saranex coated Tyvek Suit
- Inner Nitrile "N-Dex" gloves
- Outer Nitrile (NBR) gloves
- Steel toe and shank boots
- Outer boots (chemical resistant)
- Hard hat
- Hearing protection (as appropriate)

## 5.1.6 Personal Use Factors and Equipment Change Out Schedule

Prohibitive or precautionary measures should be taken as necessary to prevent workers from jeopardizing safety during equipment use.

If necessary, all respiratory protective equipment used will be approved by NIOSH/MSHA. Respirator cartridges will be changed once per eight-hour shift at a minimum. This can be accomplished at the end of the workday during respirator decontamination. Employees working within the excavation front should change the cartridge of their respirators once every four hours. If odor breakthrough is detected while wearing the respirator or if breathing becomes difficult, change cartridges immediately. A filter change out schedule is provided below.

| Remedial Worker | Work Area                | Filter Type | Replacement Rate |
|-----------------|--------------------------|-------------|------------------|
| Site Screener   | EZ – At Excavation Front | MSA GMC-H   | Every 4 Hours    |
| Laborer         | EZ – At Excavation Front | MSA GMC-H   | Every 2 Hours    |
|                 | SZ, CRZ                  | MSA GMC-H   | Every 8 Hours    |

| Equipment Operator | EZ      | MSA GMC-H | Every 4 Hours |
|--------------------|---------|-----------|---------------|
|                    | SZ, CRZ | MSA GMC-H | Every 8 Hours |
| Administrator      | EZ      | MSA GMC-H | Every 4 Hours |
|                    | SZ, CRZ | MSA GMC-H | Every 8 Hours |

When utilizing protective garments such as Tyvek suits, gloves, and booties, all seams between protective items will be sealed with duct tape.

Contact with contaminated surfaces, or surfaces suspected of being contaminated, should be avoided. This includes walking through, kneeling in, or placing equipment in puddles, mud, discolored surfaces, or on drums and other containers.

Eating, smoking, drinking, and/or the application of cosmetics in the immediate work area is prohibited. Ingestion of contaminants or absorption of contaminants into the skin may occur.

The use of contact lenses on the job site is strongly advised against. Contact lenses may trap contaminants and/or particulate between the lens and eye, causing irritation. However, when glasses are not available, contact lenses are preferred over faulty vision. When contact lenses are worn, safety glasses and/or goggles must be worn at all times while on the job site. Wearing contact lenses with a respirator in a contaminated atmosphere is prohibited under 29 CFR ss1910.134 (e)(5)(iii).

#### 6 Work Zones

#### 6.1 Work Zone Definitions

Work and support areas shall be established based on ambient air data and proposed work sites. They shall be established in order to contain contamination within the smallest areas possible and shall ensure that each employee has the proper PPE for the area or zone in which work is to be performed.

## 6.1.1 Exclusion Zone (EZ)

It is within this zone that the excavation or environmental remediation activities such as tank abandonment operations (as described in 8.1.1.1) are performed. No one shall enter this zone unless the appropriate PPE is donned. The location of this zone will change as the construction-related excavation activities are performed.

## 6.1.2 Contaminant Reduction Zone (CRZ)

It is within this zone that the decontamination process is undertaken. Personnel and their equipment must be adequately decontaminated before leaving this zone for the support zone. This zone will be set up between the EZ (no less than 100 feet away) and the site boundary.

## 6.1.3 Support Zone (SZ)

The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is put on within the SZ before entering the EZ or the CRZ. The SZ will be established in a safe environment at least 50 feet away from the EZ.

## 7 General Safety and Health Provisions

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to general safety and health provisions. Rather, contractors, subcontractors and workers at the site must refer to OSHA's General Safety and Health Provision Standard, set forth at 29 C.F.R. § 1910 subparts C and G as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

## 7.1 Safety Practices / Standing Orders

The following are important safety precautions that will be enforced during work activities.

- 1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.
- 2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.
- 3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garments are removed.

- 4. No excessive facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory protection equipment. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. Fit testing shall be performed prior to respirator use to ensure the wearer obtains a proper seal.
- 5. Contact with potentially contaminated surfaces should be avoided whenever possible. One should not walk through puddles; kneel on the ground; lean, sit, or place equipment on drums, containers, vehicles, or the ground.
- 6. Medicine and alcohol can potentate the effect from exposure to certain compounds. Prescribed drugs and alcoholic beverages should not be consumed by personnel involved in the project.
- 7. Personnel and equipment in the work areas should be minimized, consistent with effective site operations.
- 8. Work areas for various operational activities should be established.
- 9. Procedures for leaving the work area must be planned and implemented prior to going to the site. Work areas and decontamination procedures must be established on the basis of prevailing site conditions.
- 10. Respirators will be issued for the exclusive use of one worker and will be cleaned and disinfected after each use.
- 11. Safety gloves and boots shall be taped to the disposable, chemical-protective suits as necessary.
- 12. All unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
- 13. Noise mufflers or earplugs may be required for all site personnel working around heavy equipment. This requirement will be at the discretion of the Site Health and Safety Officer. Disposable, form-fitting plugs are preferred.
- 14. Cartridges for air-purifying respirators in use will be changed daily at a minimum.

## 7.2 Buddy System

Site personnel will employ the buddy system when working under certain circumstances, such as enclosed spacing.

Under the buddy system, each site worker is responsible for monitoring the well-being of another worker. No one will work alone when the buddy system is implemented. At no time will fewer than two employees be present at the site if activities are underway.

#### 7.3 Site Communications Plan

Mobile telephone and/or two-way radios will be used to communicate between the work parties on the site. The following standard hand signals will be used in case of failure of radio communication:

Hands on top of head = Need assistance

Thumbs up = OK, I am alright, I understand

Thumbs down = No, negative

Personnel in the Contaminated Zone should remain in constant radio communication or within sight of the project team leader. Any failure of radio communication will require the team leader to evaluate whether personnel should leave the zone.

#### 7.4 Retention of Records

The following records will be maintained on-site and in corporate records for no less than three years.

- Fit test results
- OSHA Training Certification
- Medical Questionaire and/or Medical Clearance
- Medical Data Sheets
- Accident Report Forms

#### 8 Decontamination Plan

#### 8.1 General

Personnel involved in work activities at the site may be exposed to compounds in a number of ways, despite the most stringent protective procedures. Site personnel may come in contact with vapors, gases, mists, particulates in the air, or other site media while performing site duties. Use of monitoring instruments and site equipment can also result in exposure and transmittal of hazardous substances.

In general, decontamination involves scrubbing with a detergent water solution followed by clean water rinses. All disposable items shall be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in detergent and water and scrubbed with a brush. In addition to being contaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized or replaced before they can be used again if they become soiled from exhalation, body oils, and perspiration. The manufacturer's instructions should be followed in sanitizing the respirator masks.

The Site Health and Safety Officer will be responsible for the proper maintenance, decontamination, and sanitizing of any respirator equipment that may be used on-site.

The decontamination zone layout and procedures should match the prescribed levels of personal protection.

The following procedures have been established to provide site personnel with minimum guidelines for proper decontamination. Personnel leaving the point of operations designated as the EZ must follow these minimum procedures. The decontamination process shall take place within the contaminant reduction zone.

#### 8.2 Minimum Decontamination Procedure

Personnel leaving the point of operations should remove or change outer gloves. At a minimum, boots shall be cleaned of all accumulated soil/fill. Outer boots must be properly washed where gross contamination is evident or disposed of. If Tyvek suits are being utilized, they should be removed or changed. Personnel should remove the Tyvek suits so that the inner clothing does not come in contact with any contaminated surfaces. After Tyvek removal, personnel shall remove and discard outer Nitrile gloves. Personnel shall then remove the respirator, where applicable. Respirators shall be disinfected between uses with towelettes or other sanitary methods. Potable water, at a minimum, will be present so that site personnel can thoroughly wash hands and face after leaving the point of operations.

The Site Health and Safety Officer will monitor decontamination procedures to ensure their effectiveness.

Modifications of the decontamination procedure may be necessary as determined by the Site Health and Safety Officer's observations.

#### 8.3 Standard Decontamination Procedure

The following decontamination procedures should be implemented during site operations for the appropriate level of protection.

## 8.3.1 Level B

| Segregated equipment      | Deposit equipment (tools, sampling devices, notes, monitoring instruments,  |
|---------------------------|---|
| drop                      | radios, etc.) used on the site onto plastic drop cloths.                    |
| Boot covers and glove     | Outer boots and outer gloves should be scrubbed with a decontamination      |
| wash                      | solution of detergent and water or replaced.                                |
| Rinse off boot covers and | Decontamination solution should be rinsed off boot covers and gloves using  |
| gloves                    | generous amounts of water. Repeat as many times as necessary.               |
| Tape removal              | Remove tape from around boots and gloves and place into container with      |
|                           | plastic liner.  |
| Boot cover removal        | Remove disposable boot covers and place into container with plastic liner.  |
| Outer glove removal       | Remove outer gloves and deposit in container with plastic liner.            |
| Suit / safety boot wash   | Completely wash splash suit, SCBA, gloves, and safety boots. Care should be |
|                           | exercised that no water is allowed into the SCBA regulator. It is suggested |
|                           | that the SCBA regulator be wrapped in plastic.                              |
| Suit / safety boot rinse  | Thoroughly rinse off all decontamination solution from protective clothing. |
| Tank or canister changes  | This is the last step in the decontamination procedure for those workers    |
|                           | wishing to change air tanks and return to the EZ. The worker's air tank or  |

|                         | cartridge is exchanged, new outer glove and boot covers are donned, and       |  |
|-------------------------|---|--|
|                         | joints taped.   |  |
| Removal of safety boots | Remove safety boots and deposit in container with a plastic liner.            |  |
| SCBA backpack removal   | Without removing the face piece, the SCBA backpack should be removed and      |  |
|                         | placed on a table. The face piece should then be disconnected from the        |  |
|                         | remaining SCBA unit and then proceed to the next station.                     |  |
| Splash suit removal     | With care, remove the splash suit. The exterior of the splash suit should not |  |
|                         | come in contact with any inner layers of clothing.                            |  |
| Inner glove wash        | The inner gloves should be washed with a mild decontamination solution        |  |
|                         | (detergent / water).  |  |
| Inner glove rinse       | Generously rinse the inner gloves with water.                                 |  |
| Face piece removal      | Without touching the face with gloves, remove the face piece. The face piece  |  |
|                         | should be deposited into a container that has a plastic liner.                |  |
| Inner glove removal     | Remove the inner glove and deposit into a container that has a plastic liner. |  |
| Field wash              | Wash hands and face thoroughly. If highly toxic, skin corrosive, or skin      |  |
|                         | absorbent materials are known or suspected to be present, a shower should     |  |
|                         | be taken.   |  |

#### 8.3.2 Level C and Level D

The decontamination procedure for Level C and Level D will be satisfied with the Minimum procedures outlined in section 8.2.

## 8.4 Heavy Equipment and Handling Equipment Decontamination

Equipment traversing the site and exiting the site will be subjected to a decontamination protocol. At a minimum the protocol will consist of an inspection of the truck fenders, tires and mud flaps for accumulated soil/fill, and removal of all accumulations using hand tools (brush, broom and scrapers). If deemed necessary by the Health and Safety Officer, this inspection will be performed over a thirty by fifteen foot area that has been filled with ¾ inch crushed recycled concrete aggregate to facilitate the removal of soil/fill accumulations from the tires, and to immobilize soil/fill removed from the truck body. Additionally, all trucks hauling waste will be required to be covered prior to exiting the site.

At the conclusion of the use of each piece of excavation equipment on the site, it will be decontaminated with an Alconox / water solution followed by a clean water rinse within the Contaminant Reduction Zone. The rinsate will be allowed to charge into the site ground.

## 9 Emergency Response / Contingency Plan

## 9.1 Pre-Emergency Planning

In order to properly prepare for emergencies, Material Safety Data Sheets (MSDS) will be maintained on-site for the type of contaminants to which workers may be exposed. Based upon the results of previous investigations, these

contaminants consist of a mixture of organic compounds consistent with those found within dry cleaning fluids and chemical processing or utilization facilities. The SDSs for these products are found in **Appendix D**.

In the event a suspected or known hazardous substance or substance container is encountered during site activities, a contingency plan will be triggered (see Section 11.3).

## 9.2 Emergency Contact Information

In the event of an accident or emergency situation, emergency procedures will be executed. Said procedures can and will be executed by the first person to observe an accident or emergency situation. The Project Field Manager will be notified about the situation immediately after emergency procedures are implemented.

## 9.2.1 Emergency Contacts

| Emergency:                | 911          |                      |
|---------------------------|--------------|----------------------|
| Hospital:                 | 718-869-7000 | St. John's Episcopal |
| Police:                   | 911          | Police               |
| Fire Department:          | 911          | NYFD                 |
| Chemtrec:                 | 800-424-9300 |                      |
| Poison Control Center:    | 800-336-6997 |                      |
| National Response Center: | 800-424-8802 |                      |
| US EPA (24-hour hotline): | 800-424-9346 |                      |

Driving directions to St John's Episcopal Hospital and a map showing the respective route to the hospital are provided in **Appendix F**, at the end of this document.

## 9.2.2 Utility Emergencies / Initiating Subsurface Investigation Work

Where necessary, utility markouts will be called in via the one call center or to the individual entities listed below.

| Mark Out One-Call Center (811) | 1-800-272-4480 | No-Cuts    |
|--------------------------------|----------------|------------|
| Gas Company:                   | 718-643-4050   | Con Edison |
| Telephone Company:             | 516-661-6000   | Verizon    |
| Electric Company:              | 718-643-4050   | Con Edison |

#### 9.3 Contingency / Evacuation Plan

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to emergency procedures. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Employee Emergency Action Plan Standard, set forth at 29 C.F.R. § 1910 Part 1926.35(a), as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

If an unknown substance or substance container is encountered during site activities, the following contingency plan will be triggered.

- The Site Health and Safety Officer, Project Manager and Field Operations Leader will be notified and an Exclusion Zone (the aerial extent of which will be determined by the above safety staff) will be established.
- 2. All staff will be evacuated from the Exclusion Zone.
- 3. Air monitoring will be conducted down-wind of the Exclusion Zone.
- 4. The NYSDEC, as well as any other Government regulatory agency whose need may be prompted by the particular situation, will be notified.
- 5. Upon arrival of the NYSDEC or Government regulatory agency representative(s), site control will transfer to the appropriate Government personnel.

It may be possible that a situation could develop site emergency could necessitate the evacuation of all personnel from the site. If such a situation develops, an audible alarm shall be given for site evacuation (consisting of an air horn). Personnel shall evacuate the site in a calm and controlled fashion and regroup at a predetermined location. The route of evacuation will be dependent on wind direction, severity, type of incident, etc. The site must not be re-entered until back-up help, monitoring equipment, and/or personal protective equipment are on hand and the appropriate regulatory agencies have been notified.

#### 9.4 Emergency Medical Treatment Procedures

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to medical treatment and first aid. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Medical Services and First Aid Standard, set forth at 29 C.F.R. § 1910 Part 1926.23 and 1926.50, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

All injuries, no matter how slight, will be reported to the site safety supervisor immediately. The safety supervisor will complete an accident report for all incidents (**Appendix E**).

Some injuries, such as severe lacerations or burns, may require immediate treatment. Unless required due to immediate danger, seriously injured persons should not be moved without direction from attending medical personnel.

## 9.4.1 Standard Procedures for Injury

- 1. Notify the Site Health and Safety Officer, Project Manager, and the NYCDEP and NYCDHPD of all accidents, incidents, and near emergency situations.
- 2. If the injury is minor, trained personnel should proceed to administer appropriate first aid.
- 3. Telephone for ambulance/medical assistance if necessary. Whenever possible, notify the receiving hospital of the nature of physical injury or chemical overexposure. If no phone is available, transport the person to the nearest hospital. Refer to the map in section 11.2.1.
- 4. When transporting an injured person to a hospital, bring this Health and Safety Plan with the attached MSDS to assist medical personnel with diagnosis and treatment.

## 9.4.2 Chemical Overexposure

In all cases of chemical overexposure, follow standard procedures as outlined below for poison management, first aid, and, if applicable, cardiopulmonary resuscitation. Different routes of exposure and their respective first aid/poison management procedures are outlined below.

| Ingestion   | Do not induce vomiting unless prompted by a health professional. Transport |  |
|---|--|--|
|   | person to nearest hospital immediately.                                    |  |
| Inhalation / Confined Do not enter a confined space to rescue someone who has been overcome |  |  |
| Space   | unless properly equipped and a standby person present.                     |  |

| Inhalation / Other   | Move the person from the contaminated environment. Initiate CPR if necessary. Call or have someone call for medical assistance. Refer to MSDS for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible. |
|--|--|
| Skin Contact / Non-<br>Caustic Contaminant<br>(Petroleum, Gasoline,<br>etc.) | Wash off skin with a large amount of water immediately. Remove any affected clothing and rewash skin using soap, if available. Transport person to a medical facility if necessary.  |
| Skin Contact / Corrosive<br>Contaminant (Acids,<br>Hydrogen Peroxide, etc.)  | Wash off skin with a large amount of water immediately. Remove any affected clothing and rewash skin with water. Transport person to a medical facility if necessary.  |
| Eyes   | Hold eyelids open and rinse the eyes immediately with large amounts of water for 15 minutes. Never permit the eyes to be rubbed. Transport person to a medical facility as soon as possible.   |

## 9.4.3 First Aid for Injuries Incurred During Field Work

A first aid kit and an emergency eyewash will be available on-site. Field crews, when performing field operations, will carry portable first aid kits that include emergency eye wash stations.

## 9.4.4 First Aid Equipment List

The first aid kit(s) kept at the site will consist of a weatherproof container with individually sealed packages for each type of item.

The kit will include at least the following items:

- Gauze roller bandages, 1-inch and 2-inch
- Gauze compress bandages, 4-inch
- Gauze pads, 2-inch
- Adhesive tape, 1-inch
- Bandage, 1-inch
- Butterfly bandages
- Triangular bandages, 40-inch
- Ampules of ammonia inhalants
- Antiseptic applicators or swabs
- Burn dressing and sterilized towels

- Surgical scissors
- Eye dressing
- Portable emergency eye wash
- Emergency oxygen supply
- Alcohol
- Hydrogen peroxide
- Clinical grade thermometer
- Tourniquet

## 9.4.5 Other Emergency Equipment

One portable fire extinguisher with a rating (ratio) of 20 pound A/B/C and one portable fire extinguisher with a rating of 2A will be conspicuously and centrally located between the restricted and non-restricted zones. In addition, similar extinguishers of the same size and class will be located in the site office trailer so that maximum travel distance to the nearest unit shall not exceed 50 feet. Portable extinguishers will be properly tagged with inspection dates and maintained in accordance with standard maintenance procedures for portable fire extinguishers. Field personnel will be trained in fire extinguisher use before field operations begin.

An emergency at any part of the site, such as fire or chemical release, might require that some appropriately trained site workers direct traffic on or near the site.

The following safety equipment to be used for traffic should be kept readily available on site in the field office:

- reflective/fluorescent vests
- flares
- traffic cones (and flags, or the equivalent, as needed)
- hazard tape (barricades as needed)
- working flashlights

## 9.5 Record of Injuries Incurred On-Site

## 9.5.1 Occupational Injuries and Illnesses Form (OSHA 200)

All occupational injuries and illnesses that are required to be recorded under the Occupational Safety and Health Act will be registered on OSHA Form 200 (see **Appendix C**). The site safety supervisor will record occupational injuries and illnesses within 48 hours of occurrence, as required by statute.

## 9.5.2 Employer's First Report of Injury

The site safety supervisor for all accidents involving work injury at the site will complete this form (Appendix D). Follow-up procedures will include investigation of each accident or near-miss by the safety supervisor to assure that no similar accidents occur in the future.

## Appendix A:

Acknowledgment Statement

| DATE   | EMPLOYEE NAME | SAFETY<br>OFFICER/SUPERVISOR | ACKNOLEDGEMENT THAT YOU HAVE READ<br>AND UNDERSTSAND THE HASP SUPPLEMENT –<br>TARGET SAFETY TOPIC FOR CONSTRUCTION<br>PERSONNEL |
|--------|---------------|------------------------------|---|
| 200.50 |               |                              |   |
|        |               |                              |   |
|        |               |                              |   |
|        |               |                              |   |
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|        |               |                              |   |
|        |               |                              |   |
|        |               |                              |   |

# Appendix B:

OSHA Respirator Medical Evaluation Questionnaire

# **Attachment 4**

# $\label{lem:condition} \begin{tabular}{ll} Appendix $C$ to 1910.134:OSHA Respirator Medical Evaluation Questionnaire (Mandatory) \end{tabular}$

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

| To the employee:   |
|--|
| Can you read (circle one): Yes No  |
| Your employer must allow you to answer this questionnaire during normal working hours, or at a time and      |
| place  |
| that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or |
| review your answers, and your employer must tell you how to deliver or send this questionnaire to the        |
| health   |
| care professional who will review it.  |
| Part A. Section 1. (Mandatory) The following information must be provided by every employee who has          |
| been   |
| selected to use any type of respirator (please print).   |
| 1. Today's date:   |
| 2. Your name:  |
| 3. Your age (to nearest year):   |
| 4. Sex (circle one): Male Female   |
| 5. Your height: ft in. 6. Your weight: lbs.  |
| 6. Your weight: lbs.   |
| 7. Your job title:   |
| 8. A phone number where you can be reached by the health care professional who reviews this                  |
| questionnaire  |
| (include the Area Code):   |
| (include the Area Code):  9. The best time to phone you at this number:                                      |
| 10. Has your employer told you how to contact the health care professional who will review this              |
| questionnaire  |
| (circle one):  |
| 11. Check the type of respirator you will use (you can check more than one category):                        |
| a N, R, or P disposable respirator (filter-mask, non-cartridge type only).                                   |
| b Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-          |
| contained  |
| breathing apparatus).  |
| 12. Have you worn a respirator (circle one):   |
| No   |
| If "yes," what   |
| type(s):   |
|  |
|  |
|  |

| Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by ever         | y employee who |
|---|----------------|
| has been  |                |
| selected to use any type of respirator (please circle "yes" or "no").                       |                |
| 1. Do you currently smoke tobacco, or have you smoked tobacco in the last month:            | Yes            |
| No  |                |
| 2. Have you ever had any of the following conditions?                                       |                |
| a. Seizures (fits):   |                |
| b. Diabetes (sugar disease):  |                |
| c. Allergic reactions that interfere with your breathing:                                   |                |
| d. Claustrophobia (fear of closed-in places):   |                |
| e. Trouble smelling odors (except when you had a cold):                                     | Yes No         |
| 3. Have you ever had any of the following pulmonary or lung problems?                       |                |
| a. Asbestosis:  | . Yes No       |
| b. Asthma:  | Yes No         |
| c. Chronic bronchitis:  | . Yes No       |
| d. Emphysema:   |                |
| e. Pneumonia:   |                |
| f. Tuberculosis:  |                |
| g. Silicosis:   |                |
| h. Pneumothorax (collapsed lung):   |                |
| i. Lung cancer:   |                |
| j. Broken ribs:   |                |
| k. Any chest injuries or surgeries:   |                |
| l. Any other lung problem that you've been told about:                                      |                |
| 4. Do you currently have any of the following symptoms of pulmonary or lung illness?        | 1 05 110       |
| a. Shortness of breath:   | Vac No         |
| b. Shortness of breath when walking fast on level ground or walking up a slight hill or inc |                |
| c. Shortness of breath when walking with other people at an ordinary pace on level groun    |                |
| d. Have to stop for breath when walking at your own pace on level ground:                   |                |
|   |                |
| e. Shortness of breath when washing or dressing yourself:                                   |                |
| f. Shortness of breath that interferes with your job:                                       |                |
| g. Coughing that produces phlegm (thick sputum):  |                |
| h. Coughing that wakes you early in the morning:  |                |
| i. Coughing that occurs mostly when you are lying down:                                     |                |
| j. Coughing up blood in the last month:   |                |
| k. Wheezing:  |                |
| 1. Wheezing that interferes with your job:  |                |
| m. Chest pain when you breathe deeply:  | Yes No         |
| n. Any other symptoms that you think may be related to lung problems:                       | Yes No         |
| 5. Have you ever had any of the following cardiovascular or heart problems?                 |                |
| a. Heart attack:  | . Yes No       |
| b. Stroke:  | Yes No         |
| c. Angina:  | . Yes No       |
| d. Heart failure:   | Yes No         |
| e. Swelling in your legs or feet (not caused by walking):                                   |                |
| f. Heart arrhythmia (heart beating irregularly):  |                |
| g. High blood pressure:   |                |
| h. Any other heart problem that you've been told about:                                     |                |
| ,r , , ,  |                |

| 6. Have you ever had any of the following cardiovascular or heart symptoms?   |  |
|---|--|
| a. Frequent pain or tightness in your chest:  |  |
| b. Pain or tightness in your chest during physical activity:  | Yes No   |
| c. Pain or tightness in your chest that interferes with your job:   |  |
| d. In the past two years, have you noticed your heart skipping or missing a beat:   |  |
| e. Heartburn or indigestion that is not related to eating:  |  |
| f. Any other symptoms that you think may be related to heart or circulation problem 7. Do you currently take medication for any of the following problems?  | ns: Yes No   |
| a. Breathing or lung problems:  | Yes No   |
| b. Heart trouble:   |  |
| c. Blood pressure:  |  |
| d. Seizures (fits):   |  |
| 8. Has your wearing a respirator caused any of the following problems? (If you've r   |  |
| respirator, check the following space and go to question 9:)  | iever used a   |
| a. Eye irritation:  | Yes No   |
| b. Skin allergies or rashes:  |  |
| c. Anxiety that occurs only when you use the respirator:  |  |
| d. Unusual weakness or fatigue:   |  |
| e. Any other problem that interferes with your use of a respirator:   |  |
| 9. Would you like to talk to the health care professional who will review this questi   |  |
| answers   | omane about your   |
| to this questionnaire:  | Vac Na   |
| www.io  | 1 es no  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been  | elected to use either a<br>employees who have  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have   |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently): No   | elected to use either a employees who have   |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For elected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently): No 11. Do you currently have any of the following vision problems?   | elected to use either a employees who have  yYes   |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  yYes   |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently): No 11. Do you currently have any of the following vision problems?  a. Wear contact lenses:  | elected to use either a employees who have  'yYesYes NoYes No  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  'y   |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For expectation been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently): No  11. Do you currently have any of the following vision problems?  a. Wear contact lenses:   | elected to use either a employees who have  y  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For expectation been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  Ty.  Yes  Yes  Yes No  Yes No  Yes No  Yes No  Yes No  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For expectation been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently): No  11. Do you currently have any of the following vision problems?  a. Wear contact lenses:   | elected to use either a employees who have  Ty.  Yes  Yes  Yes No  Yes No  Yes No  Yes No  Yes No  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  Ty.  Yes  Yes  Yes No  Yes No  Yes No  Yes No  Yes No  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For a been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  y  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For elementary been selected to use other types of respirators, answering these questions is voluntary 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  y  |
| Questions 10 to 15 below must be answered by every employee who has been so full-facepiece respirator or a self-contained breathing apparatus (SCBA). For been selected to use other types of respirators, answering these questions is voluntar 10. Have you ever lost vision in either eye (temporarily or permanently):  | elected to use either a employees who have  y  |
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| i. Difficulty climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes No j. Any other muscle or skeletal problem that interferes with using a respirator: Yes No Part B Any of the following questions, and other questions not listed, may be added to the |  |  |
|--|--|--|
| questionnaire at   |  |  |
| the discretion of the health care professional who will review the questionnaire.  1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower that   |  |  |
| normal   |  |  |
| amounts of oxygen: Yes No If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes  |  |  |
| No 2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals   |  |  |
| (e.g.,   |  |  |
| gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes   |  |  |
| If "yes," name the chemicals if you know them:   |  |  |
| 3. Have you ever worked with any of the materials, or under any of the conditions, listed below:   |  |  |
| a. Asbestos: Yes No b. Silica (e.g., in sandblasting): Yes No c. Tungsten/cobalt (e.g., grinding or welding this material): Yes No d. Beryllium: Yes No  |  |  |
| e. Aluminum: Yes No f. Coal (for example, mining): Yes No  |  |  |
| g. Iron: Yes No  |  |  |
| h. Tin: Yes No   |  |  |
| i. Dusty environments: Yes No  |  |  |
| j. Any other hazardous exposures: Yes No   |  |  |
| If "yes," describe these   |  |  |
| exposures:   |  |  |
|  |  |  |
| <del></del>  |  |  |
| 4. List any second jobs or side businesses you have:   |  |  |
| have:  |  |  |
| 5. List your previous occupations:   |  |  |
| 6. List your current and previous hobbies:   |  |  |
|  |  |  |
| 7. Have you been in the military services? Yes No If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes No 8. Have you ever worked on a HAZMAT team?   |  |  |
| No   |  |  |

| them:  |   |
|--|---|
| them:  |   |
| a. HEPA Filters:   |   |
| b. Canisters (for example, gas masks):   | Yes No                                  |
| c. Cartridges:   | Yes No                                  |
| 11. How often are you expected to use the respirator(s) (circle "yes" or "no" for  | all answers that apply to               |
| you)?:   |   |
| a. Escape only (no rescue):  | Yes No                                  |
| b. Emergency rescue only:  | Yes No                                  |
| c. Less than 5 hours per week:   | Yes No                                  |
| d. Less than 2 hours per day:  | Yes No                                  |
| e. 2 to 4 hours per day:   |   |
| f. Over 4 hours per day:   |   |
| 12. During the period you are using the respirator(s), is your work effort:  |   |
| a. Light (less than 200 kcal per hour):  | Yes No                                  |
| If "yes," how long does this period last during the average shift:l  | nrsmins.                                |
| Examples of a light work effort are sitting while writing, typing, drafting, or per  | rforming light assembly                 |
| work; or   |   |
| standing while operating a drill press (1-3 lbs.) or controlling machines.   |   |
| b. Moderate (200 to 350 kcal per hour):  | Yes No                                  |
| If "yes," how long does this period last during the average shift:l  | nrs. mins.                              |
| Examples of moderate work effort are sitting while nailing or filing; driving a ti   | ruck or bus in urban traffic;           |
| standing while drilling, nailing, performing assembly work, or transferring a mo   |   |
| at   | ,                                       |
| trunk level; walking on a level surface about 2 mph or down a 5-degree grade a   | bout 3 mph; or pushing a                |
| wheelbarrow with a heavy load (about 100 lbs.) on a level surface.   | 1 / 1 &                                 |
| c. Heavy (above 350 kcal per hour):  | Yes No                                  |
| If "yes," how long does this period last during the average shift:   | nrs. mins.                              |
| Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to  | to your waist or shoulder.              |
| working  | , |
| on a loading dock; shoveling; standing while bricklaying or chipping castings;   | walking un an 8-degree                  |
| grade  | waiking up an o degree                  |
|  |   |
| about 7 mph, climbing stairs with a heavy load (about 50 lbs )   | spirator) when you're using             |
|  | opilator, which you're using            |
| 13. Will you be wearing protective clothing and or equipment (other than the re  |   |
| 13. Will you be wearing protective clothing and or equipment (other than the reyour  | Vec No                                  |
| 13. Will you be wearing protective clothing and or equipment (other than the re your respirator:   | Yes No                                  |
| about 2 mph; climbing stairs with a heavy load (about 50 lbs.).  13. Will you be wearing protective clothing and or equipment (other than the re your respirator:  If "yes," describe this protective clothing and or equipment: | Yes No                                  |

| 16. Describe the work you'll be doing while you're using your respirator(s):   |
|--|
|  |
| 17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for                 |
| example, confined spaces, life-threatening gases):   |
|  |
| 18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when                 |
| you're using your respirator(s):   |
| Name of the first toxic substance:   |
| Name of the first toxic substance:  Estimated maximum exposure level per shift:  |
| Duration of exposure per shift   |
| Name of the second toxic substance:  |
| Estimated maximum exposure level per shift:  |
| Duration of exposure per shift:  |
| Name of the third toxic substance:   |
| Estimated maximum exposure level per shift:  |
| Duration of exposure per shift:  |
| Duration of exposure per shift:  The name of any other toxic substances that you'll be exposed to while using your respirator: |
|  |
| 19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and            |
| well-being of others (for example, rescue, security):  |
|  |
|  |
|  |

# Apéndice C: Cuestionario de Evaluación Médico obligado por la OSHA (La agencia de seguridad y salud ocupacional)

# Parte 29 CFR 1910.134 Mandatorio para Proteccion del Sistema Respiratorio

Marque con un circulo para indicar sus respuestas a cada pregunta.

Para el empleado: Puede usted leer (circule uno): Sí o No

Su patrón debe dejarlo responder estas preguntas durante horas de trabajo o en un tiempo y lugar que sea conveniente para usted. Para mantener este cuestionario confidencial, su patrón o supervisor no debe ver o revisar sus respuestas. Su patrón debe informarle a quien dar o enviar este cuestionario para ser revisado

| por un   |
|--|
| profesional de sanidad con licencia autorizado por el estado.  |
| Parte A. Sección 1. (Mandatorio). La siguiente información debe de ser proveida por cada empleado que  |
| ha   |
| sido seleccionado para usar cualquier tipo de respirador (escriba claro por favor).                    |
| 1. Fecha:  |
| 2. Nombre:   |
| 3. Edad: 4. Su sexo (circule uno) Masculino o Femenino   |
| 4. Su sexo (circule uno) Masculino o Femenino  |
| 5. Altura:piespulgadas   |
| 6. Peso:libras   |
| 7. Su ocupación, título o tipo de trabajo:   |
| 8. Número de teléfono al donde pueda ser llamado por un profesional de sanidad con licencia que        |
| revisara este cuestionario (incluva el área):  |
| 9. Indique la hora mas conveniente para llamarle a este numero:  |
| 10. ¿Le ha informado su patrón como comunicarse con el profesional de sanidad con licencia que va a    |
| revisar  |
| este cuestionario (circule una respuesta)?   |
| No   |
| 11. Anote el tipo de equipo protector respíratorio que va utilizar (puede anotar mas de una categoría) |
| a Respirador disponible de clase N, R, o P (por ejemplo: respirador de filtro mécanico, respirado      |
| sin  |
| cartucho)  |
| b Otros tipos (respirador con cartucho químico, máscara con cartucho químico, máscara con              |
| manguera con soplador (PAPR), máscara con manguera sin soplador (SAR), aparato respiratorio autónomo   |
| (SCBA)).   |
| 12. ¿Ha usado algun tipo de respirador?  |
| No   |
| Si ha usado equipo protector respíratorio, que tipo(s) ha utilizado:                                   |
|  |

| Parte A. Seccion 2. (Mandatorio): Preguntas del 1 al 9 deben ser contestadas por cada  | empleado que fue   |
|--|--|
| seleccionado a usar cualquier tipo de respirador. Marque con un circulo para indicar su  | s repuestas.   |
| 1. ¿Corrientemente fuma tabaco, o ha fumado tabaco durante el ultimo mes?  | Sí o   |
| No   |  |
| 2. ¿Ha tenido algunas de las siguientes condiciones medicas?   |  |
| a. Convulsiones:   | Sí o No  |
| b. Diabetes (azucar en la sangre):   |  |
| c. Reacciones alergicas que no lo deja respirar:   |  |
| d. Claustrofobia (miedo de estar en espacios cerrados):  |  |
| e. Dificultad oliendo excepto cuando ha cogido un resfriado:   |  |
| 3. ¿Ha tenido algunas de los siguientes problemas pulmonares?  |  |
| a. Asbestosis:   | Sí o No  |
| b. Asma:   |  |
| c. Bronquitis cronica:   |  |
| d. Emfisema:   |  |
| e. Pulmonía:   |  |
| f. Tuberculosis:   |  |
|  |  |
| g. Silicosis:  |  |
| h. Neumotorax (pulmon colapsado):  |  |
| i. Cáncer en los pulmones:   |  |
| j. Costillas quebradas:  |  |
| k. Injuria o cirujía en el pecho:  |  |
| l. Algun otro problema de los pulmones que le ha dicho su medico:  |  |
| 4. ¿Corrientemente tiene alguno de los siguientes síntomas o enfermedades en sus puln  |  |
| a. Respiración dificultosa   |  |
| h Rechiración dificultosa cuando camina ranido cobre terreno hlano o cubiendo una co   | 1' 0' 3 T  |
| b. Respiración difícultosa cuando camina rapido sobre terreno plano o subiendo una co  |  |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrence   | o plano: Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno d. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  | o plano: Sí o No<br>Sí o No  |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno d. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No<br>Sí o No<br>Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno d. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No<br>Sí o No<br>Sí o No<br>Sí o No  |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno d. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terreno d. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No  |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No<br>Sí o No   |
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| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración dificultosa cuando se esta bañando o vistiendo:  f. Respiración dificultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha dificultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:   | o plano: Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello? e. Respiración dificultosa cuando se esta bañando o vistiendo:   | o plano: Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración dificultosa cuando se esta bañando o vistiendo:  f. Respiración dificultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha dificultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  | o plano: Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración dificultosa cuando se esta bañando o vistiendo:  f. Respiración dificultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha dificultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  | o plano: Sí o No   |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración dificultosa cuando se esta bañando o vistiendo:  f. Respiración dificultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha dificultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  f. Latidos irregulares del corazón:   | o plano: Sí o No   |
| c. Respiración difícultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración difícultosa cuando se esta bañando o vistiendo:  f. Respiración difícultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha difícultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  f. Latidos irregulares del corazón:  g. Alta presión:  | o plano: Sí o No                 |
| c. Respiración difícultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración difícultosa cuando se esta bañando o vistiendo:  f. Respiración difícultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha difícultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  f. Latidos irregulares del corazón:  g. Alta presión:  h. Algun otro problema cardio-vascular o cardiaco:   | o plano: Sí o No                 |
| c. Respiración dificultosa cuando camina normalmente con otras personas sobre terrence.  d. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración dificultosa cuando se esta bañando o vistiendo:  f. Respiración dificultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha dificultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  f. Latidos irregulares del corazón:  g. Alta presión:  h. Algun otro problema cardio-vascular o cardiaco:  6. ¿Ha tenido algunos de los siguientes síntomas causados por su corazón? | o plano: Sí o No                         |
| c. Respiración difícultosa cuando camina normalmente con otras personas sobre terrend. Cuando camina normalmente en terreno plano se encuentra corto de resuello?  e. Respiración difícultosa cuando se esta bañando o vistiendo:  f. Respiración difícultosa que lo impede trabajar:  g. Tos con flema:  h. Tos que lo despierta temprano en la mañana:  i. Tos que occure cuando esta acostado:  j. Ha tosido sangre en el ultimo mes:  k. Silbar o respirar con mucha difícultad:  l. Silbar que lo impede trabajar:  m. Dolor del pecho cuando respira profundamente:  n. Otros símtomas que crea usted estar relacionados a los pulmones:  5. ¿Ha tenido algunos de los siguientes problemas con el corazón?  a. Ataque cardiaco:  b. Ataque cerebrovascular:  c. Dolor en el pecho:  d. Falla de corazón:  e. Hinchazón en las piernas o pies (que no sea por caminar):  f. Latidos irregulares del corazón:  g. Alta presión:  h. Algun otro problema cardio-vascular o cardiaco:   | o plano: Sí o No |

| c. Dolor o pecho apretado que no lo deja trabajar normalmente:   | . Sí o No              |
|--|------------------------|
| e. Dolor en el pecho o indigestion que no es relacionado a la comida:  | circulation.           |
| 7. ¿Esta tomando medicina por algunso de los siguientes problemas? a. Respiración dificultosa:   |                        |
| b. Problemas del corazón: Síc. Alta presión: Sí  | Sí o No                |
| d. Convulsiones: S  8. ¿Le ha causado alguno de los siguientes problemas usando el respirador? (si no ha usado el seguina de los siguientes problemas usando el respirador).   | Sí o No                |
| deje esta pregunta en blanco y continue con pregunta 9).   |                        |
| a. Irritación de los ojos:   |                        |
| b. Alergias del cutis o sarpullido:  c. Ansiedad que ocurre solamente cuando usa el respirado:  d. Dabilidad. Gibs. de visca a fatiga de consecuente de de consecuente de c | . Sí o No              |
| d. Debilidad, falta de vigor o fatiga desacostumbrada:  e. Algun otro problema que le impida utilizar su respirador:  9. ¿Le gustaria hablar con el profesional de sanidad con licencia autorizado por el estado que   | Sí o No                |
| cuestionario sobre sus respuestas?   |                        |
| Las preguntas del 10 al 15 deben ser contestadas por los empleados seleccionados para máscara  | usar una               |
| con cartucho químico o aparato respiratorio autónomo (SCBA). Los empleados que us respirador no tienen que contestar estas preguntas.  | an otro tipo de        |
| 10. ¿Ha perdido la vista en cualquiera de sus ojos (temporalmente o permanente):   | Sí o                   |
| 11. ¿Corrientemente tiene algunos de los siguientes problemas con su vista?  |                        |
| a. Usa lentes de contacto: S<br>b. Usa lentes: Si  |                        |
| c. Daltoniano (dificultad distinguiendo colores): d. Tiene algún problema con sus ojos o su vista:   | Sí o No                |
| 12. ¿Ha tenido daño en sus oidos incluyendo rotura del tímpano:  | Sí o                   |
| 13. ¿Corrientemente tiene uno de las siguientes problemas para oir? a. Dificultad oyendo:  | Sí o No                |
| b. Usa un aparato para oir:  | í o No                 |
| c. Tiene algun otro problema con sus oidos o dificultad escuchando:  |                        |
| 15. ¿Tiene uno de los siguientes problemas de su aparato muscular or eskeleto?   |                        |
| a. Debilidad en sus brazos, manos, piernas o pies :  |                        |
| c. Dificultad para mover sus brazos y piernas completamente:   | Sí o No                |
| d. Dolor o engarrotamiento cuando se inclina para adelante o para atras:   |                        |
| e. Dificultad para mover su cabeza para arriba o para abajo completamente:   |                        |
| f. Dificultad para mover su cabeza de lado a lado:   |                        |
| g. Difficulted para agacharse doblando sus rodillas:   |                        |
| h. Dificultad para agacharse hasta tocar el piso:  |                        |
| i. Dificultad subiendo escaleras cargando mas de 25 libras:  | . Sí o No<br>. Sí o No |

| sanidad con licencia autorizado por el estado.  |                               |
|---|-------------------------------|
| 1. ¿Esta trabajando en las alturas arriba de 5,000 pies o en sitios que tienen r          |                               |
| Si la respuesta es "Sí", se ha sentido mareado, o ha tenido dificultad respirar otro      |                               |
| síntoma que usted no tiene cuando no esta trabajando bajo estas condiciones               | :                             |
| No  |                               |
| 2. ¿En el trabajo o en su casa, ha estado expuesto a solventes o contaminante ejemplo,    | es peligrosos en el aire (por |
| humos, neblina o polvos) o ha tenido contacto del cutis con químicas peligro              | osas? Sí o                    |
| No  |                               |
| Escriba las químicas y productos con las que ha estado expuesto, si sabe cua              | lles                          |
| son:  |                               |
| 3. ¿Ha trabajado con los siguientes materiales o las condiciones anotadas aba             | ajo?:                         |
| a. Asbestos:  |                               |
| b. Sílice (Limpiar mediante un chorro de arena):  |                               |
| c. Tungsteno/Cobalto (pulverizar o soldadura):  |                               |
| d. Berilio:   |                               |
| e. Aluminio:  |                               |
| f. Carbón de piedra (minando):  |                               |
| g. Hierro:  |                               |
| h. Estaño:  |                               |
| i. Ambiente polvoriento:  |                               |
| j. Otra exposicion peligrosa:   |                               |
| Describa las exposiciones peligrosas:   |                               |
| The same of the same  |                               |
|   |                               |
| 4. ¿Tiene usted otro trabajo o un negocio aparte de este?                                 |                               |
|   |                               |
| 5. Apunte su previos trabajos:  |                               |
| 6. Apunte sus pasatiempos:  |                               |
|   |                               |
| 7. ¿Tiene servicio militar?   |                               |
|   | lurante entrenamiento o       |
| Si la respuesta es "Sí", ha estado expuesto a agentes químicos o biologicos d             | C' NI                         |
| Si la respuesta es "Sí", ha estado expuesto a agentes químicos o biologicos d<br>combate: |                               |
| Si la respuesta es "Sí", ha estado expuesto a agentes químicos o biologicos d             | r a incidentes de materiales  |

| N <sub>o</sub>  | Sí o                      |
|---|---------------------------|
| No  |                           |
| Si la respuesta es "Sí", cuales son   |                           |
| 10. ¿Va a usar algunas de las siguientes partes con su respirador?  | ′ C ) C′ N                |
| a. filtros HEPA (filtro de alta eficiencia que remueve partículas tóxicas en la atme  |                           |
| b. Canastillo (por ejemplo, máscara para gas):  |                           |
| c. Cartuchos:   | S1 0 No                   |
| 11. ¿Cuántas veces espera usar un respirador?   | C/ N                      |
| a. Para salir de peligro solamente (no rescates):   |                           |
| b. Recates de emergencia solamente:   |                           |
| c. Menos de 5 horas <i>por semana</i> :   |                           |
| d. Menos de 2 horas <i>por día</i> :  |                           |
| e. 2 a 4 horas <i>por día</i> :   |                           |
| f. Mas de 4 horas <i>por día</i> :  | Sí o No                   |
| 12. ¿Durante el tiempo de usar el respirador, su trabajo es?  |                           |
| a. Ligero (menos de 200 kcal por hora):   | Sí o                      |
| No  |                           |
| Si la respuesta es "sí", cuanto tiempo dura la obrahorasn   | ninutos                   |
| Ejemplos de trabajos ligeros: estar sentado escribiendo, escribiendo a máquina, d   | iseñando, trabajando la   |
| línea de  |                           |
| montaje, o estar parado gobernando un taladro o máquinas:   |                           |
| b. <b>Moderado</b> (200-350 kcal por hora ):  | Sí o N                    |
| Si la respuesta es "sí"cuanto tiempo dura en promedio por jornadahor  | rasminutos                |
| Ejemplos de trabajos moderados : sentado clavando o archivando; manejando un  | camión o autobús en       |
| trafico   |                           |
| pesado; estar de pie taladrando, clavando, trabajando la línea de montaje, o transf<br>libras)  | Periendo una carga (de 35 |
| a la altura de la cintura; caminando sobre tierra plana a 2 millas por hora o bajanc  | lo a 3 millas por hora;   |
| empujando una carretilla con una carga pesada (de 100 libras) sobre terreno plano   |                           |
| c. <b>Pesado</b> (mas de 350 kcal por hora):  |                           |
| No  |                           |
| Si la respuesta es "sí"cuanto tiempo dura en promedio por jornadahor  | ras minutos               |
| Ejemplos de trabajos pesados: levantando cargas pesadas (mas de 50 libras) desd   |                           |
| J. I ( ) ( ) ( )  | F                         |
| la  |                           |
|   | oie trabaiando de albañil |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de p   |                           |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de pademenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una  |                           |
| la cintura o los hombros; trabajando cargando o descargando; transpalear; estar de p demenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una libras).  | carga pesada (mas de 50   |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de p<br>demenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una<br>libras).<br>13. ¿Va a estar usando ropa o equipo protectivo cuando use el respirador?  | carga pesada (mas de 50   |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de pedemenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una libras).  13. ¿Va a estar usando ropa o equipo protectivo cuando use el respirador? No   | carga pesada (mas de 50   |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de p<br>demenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una<br>libras).<br>13. ¿Va a estar usando ropa o equipo protectivo cuando use el respirador?<br>No<br>Si la respuesta es "sí" describa que va a estar | carga pesada (mas de 50   |
| cintura o los hombros; trabajando cargando o descargando; transpalear; estar de pedemenuzando moldes; subiendo a 2 millas por hora; subiendo la escalera con una libras).  13. ¿Va a estar usando ropa o equipo protectivo cuando use el respirador? No   | carga pesada (mas de 50   |

| 7. Describa cualquier situacion especial o peligrosa que pueda encontrar cuando este usando el respi<br>por   |  |  |  |  |  |
|---|--|--|--|--|--|
| ejemplo, espacios encerrados, gases que lo puedan matar, etc.)  |  |  |  |  |  |
| 8. Provea la siguiente informacion si la sabe, por cada sustancia tóxica que usted va a estar expuesto cuando |  |  |  |  |  |
| este usando el respirador(s):   |  |  |  |  |  |
| Nombre de la primera sustancia tóxica   |  |  |  |  |  |
| Maximo nivel de exposición por jornada de trabajo   |  |  |  |  |  |
| Tiempo de exposición por jornada  |  |  |  |  |  |
| Nombre de la segunda sustancia tóxica   |  |  |  |  |  |
| Maximo nivel de exposición por jornada de trabajo   |  |  |  |  |  |
| Fiempo de exposición por jornada  |  |  |  |  |  |
| Nombre de la tercera sustancia tóxica   |  |  |  |  |  |
| Máximo nivel de exposición por jornada de trabajo   |  |  |  |  |  |
| Fiempo de exposición por jornada  |  |  |  |  |  |
| El nombre de cualquier sustancia tóxica que usted va a estar expuesto cuando este usted usando el espirador   |  |  |  |  |  |
| 9. Describa alguna responsabilidad especial que usted va a tener cuando usted este usado el respirad          |  |  |  |  |  |
| oueda afectar la seguridad o la vida de otros ( por ejemplo, rescate, seguridad).                             |  |  |  |  |  |

# Appendix C:

OSHA Form 200-Occupational Injuries & Illnesses

| Log and     | Summar   | y of Occupational                                      |  |  |  |  |  |  |
|-------------|--|--|--|--|--|--|--|--|
| Injuries a  |  | <u> </u>   |  |  |  |  |  |  |
|             |  |  |  |  |  |  |  |  |
| NOTE:       | This form i  | s required by Public Law 91-                           | 596 and must be kept   | RECORDABLE CASES: You are requ   | uired to record information about every  |  |  |  |
|             |  | olishment for 5 years. Failure                         |  | occupational death; every nonfatal occupational illness; and those nonfatal  |  |  |  |  |
|             | can result in issuance of citations and assessment of penalties. |  |  | occupational injuries which involve one or more of the following: loss of  |  |  |  |  |
|             | (See postii  | ng requirements on the other                           | side of form)  | conciousness, restriction of work or motion, transfer to another job, or   |  |  |  |  |
|             |  |  |  | medical treatment (other than first aid)   |  |  |  |  |
|             |  |  |  | (See definitions on the other side of for  | m)   |  |  |  |
| Case or     | Date of  | Employee's Name  | Occupation   | Department   | Description of Injury or Illness   |  |  |  |
|             | Injury or  |  | Сострано   | - Sparanon   | 2 Societal of Injury of Infood   |  |  |  |
|             | Onset of   |  |  |  |  |  |  |  |
| l           | Illness  |  |  |  |  |  |  |  |
|             | Enter  | Enter first name or initial, middle initial, last name | Enter regular job title, not activity employee was performing when injury occurred or at onset of illness. In the absence of a formal title, enter a brief description of the employee's duties. | Enter department in which the employee is regularly employed or a description of normal workplace to which employee is assigned, even though temporarily working in another department at the time of injury or illness. | Enter a brief description of the injury or illness and indicate the part or parts of the body affected.  Typical entries for this column might be: Amputation of 1st joint right forefinger; Strain of lower back; Contact dermatitis on both hands; Electrocution - body. |  |  |  |
|             |  |  |  |  |  |  |  |  |
| (A)         | (B)  | (C)  | (D)  | (E)  | (F)  |  |  |  |
|             |  |  |  |  | PREVIOUS PAGE TOTALS =>  |  |  |  |
|             |  |  |  |  |  |  |  |  |
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|             |  |  |  |  |  |  |  |  |
|             |  |  |  |  |  |  |  |  |
|             |  |  |  |  | TOTALS (Instructions on other side of form) =>   |  |  |  |
|             |  |  |  |  |  |  |  |  |
| OSHA No. 20 | 00   |  |  |  |  |  |  |  |
|             |  |  |  |  |  |  |  |  |

| U.S. Dep            | artment o         | t Labor           |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
|---------------------|-------------------|-------------------|-----------|------------------|-----------------------|--|---------------------------|--|---|----------------------------------|---|------------------------------|------------|--------------------------|-------------|-----------|---------------|----------------------|
|                     |                   |                   |           |                  |                       | For C                                    | alendar                   | Year _                                     |   |                                  | -   |                              | Page: _    | of                       |             |           |               | <b>&gt;//</b>        |
| Company Name        |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           | Form Approve  | ed                   |
| Establishment Nam   | е                 |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           | O.M.B. No. 1  |                      |
| Establishment Add   | ress              |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           | See OMB Dis   | sclosure             |
|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           | Statement on  | reverse.             |
| Extent of and Outco | ome of Injury     |                   |           |                  |                       | Type, Exte                               | ent of, and Ou            | utcome of Illn                             | ess   |                                  |   |                              |            |                          |             |           | -             |                      |
| Fatalities          | Nonfatal Injuries |                   |           |                  |                       | Type of Illr                             | ness                      |  |   |                                  |   |                              | Fatalities | Nonfatal Illne           | sses        |           |               |                      |
| Injury              | Injuries with     | h Lost Workd      | lays      |                  | Injuries              | CHEC                                     | K Only C                  | ne Colu                                    | mn for E  | ach Illne                        | ess                                       |                              | Illness    | Illnesses with           | Lost Workda | ys        |               | Illnesses            |
| Related             |                   |                   |           |                  | Without Lost          | (See of                                  | her side                  | of form f                                  | or termir                                       | nations                          |   |                              | Related    | Enter a                  | Enter a     | Enter     | Enter         | without Los          |
|                     | Enter a           | Enter a           | Enter     | Enter            | Workdays              | or pern                                  | nanent tr                 | ansfers)                                   |   |                                  |   |                              |            | CHECK if                 | CHECK if    | number of | number of     | Workdays             |
| Enter Date          | Check             | Check             | number of | number of        | Enter a               |  |                           |  |   |                                  |   |                              |            | Illness                  | Illness     | DAYS      | DAYS of       |                      |
| of death.           | if injury         | if injury         | DAYS      | DAYS of          | Check if no           |  |                           |  |   |                                  |   |                              | Enter      | involves                 | involves    | away from | restricted    | Enter a              |
|                     | involves          | involves          | away from | restricted       | entry was             |  |                           |  |   |                                  |   |                              | DATE       | DAYS away                | DAYS away   | work.     | work activity | CHECK if I           |
| mm/dd/yy            | DAYS<br>away from | DAYS<br>away from | work      | work<br>activity | made in column 1 or 2 |  |                           |  |   | ts                               |   |                              | of death,  | from work, or<br>DAYS of | from work.  |           |               | entry was<br>made in |
| Ппп/ас/уу           | work or           | work.             |           | activity         | but the injury        |  |                           |  | o of  | geu                              | ,   | ses                          |            | restricted               |             |           |               | columns 8            |
|                     | restricted        |                   |           |                  | is recordable         |  | sb                        | ,  | ects  | <u>a</u>                         | ₽   | nes                          |            | work activity            |             |           |               | 9                    |
|                     | work              |                   |           |                  | as defined            |  | <u> </u>                  | SUS  | eff   | ysic                             | × p                                       | <u>a</u>                     | mm/dd/yy   | or both.                 |             |           |               |                      |
|                     | activity or       |                   |           |                  | above.                | äse                                      | the                       | ditio                                      | mic.  | hd                               | iate                                      | tion                         |            |                          |             |           |               |                      |
|                     | both.             |                   |           |                  |                       | J Sk<br>Dise                             | e of                      | Condition                                  | yste<br>als)                                    | e tc                             | Soc                                       | nba                          |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       | ona                                      | eas                       | Sic 8                                      | g (s<br>teris                                   | s du                             | s as<br>I tra                             | 000                          |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       | pati                                     | Dis                       | iratc<br>o to                              | ning<br>ma                                      | der                              | ders                                      | other occupational illnesses |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       | Occupational Skin<br>Disorder or Disease | Dust Disease of the lungs | Respiratory Conditions due to toxic agents | Poisoning (systemic effects of toxic materials) | Disorders due to physical agents | Disorders associated with repeated trauma | ■ Jan                        |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       | 00                                       |                           | _ 22 5                                     |   |                                  | ے ۵                                       | ⋖                            | +          |                          |             |           |               |                      |
| (1)                 | (2)               | (3)               | (4)       | (E)              | (G)                   | (0)                                      | (b)                       | (0)  | (7)<br>( d )                                    | (0)                              | (f)                                       | ( a )                        | (8)        | (0)                      | (10)        | (11)      | (12)          | (13)                 |
| (1)                 | (2)               | (3)               | (4)       | (5)              | (6)                   | (a)                                      | (0)                       | (c)  | ( u )   | (e)                              | (1)                                       | (g)                          | (0)        | (9)                      | (10)        | (11)      | (12)          | (13)                 |
|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
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|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
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|                     |                   |                   |           |                  | <b></b>               | <u> </u>                                 |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
|                     |                   |                   |           |                  |                       |  |                           |  |   |                                  |   |                              |            |                          |             |           |               |                      |
| Certification       | of Annual Sur     | mmary Totals      | by:       |                  |                       |  |                           | Title: _                                   |   |                                  |   |                              |            |                          |             |           | Date:         |                      |

#### OMB DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to vary from 4 to 30 (time in minutes) per response with an average of 15 (time in minutes) per response, including the 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 currently valid OMB control number. If you have any comments regarding this estimate or any other aspect of this information collection, including suggestions for reducing this burden, please send them to the OSHA Office of Statistics, Room N-3644, 200 Constitution Avenue, N.W. Washington, D.C. 20210

#### Instructions for OSHA No. 200

#### I. Log and Summary of Occupational Injuries and Illnesses

Each employer who is subject to the recordkeeping requirements of the Occupational Safety and Health Act of 1970 must maintain for each establishment, a log of all recordable occupational injuries and illnesses. This form (OSHA No. 200) may be used for that purpose. A substitute for the OSHA No. 200 is acceptable if it is as detailed, easily readable, and understandable as the OSHA No. 200.

Enter each recordable case on the log within six (6) workdays after learning of its occurrence. Although other records must be maintained at the establishment to which they refer, it is possible to prepare and maintain the log at another location, using data processing equipment if desired. If the log is prepared elsewhere, a copy updated to within 45 calendar days must be present at all times in the establishment.

Logs must be maintained and retained for five (5) years following the end of the calendar year to which they relate. Logs must be available (normally at the establishment) for inspection and copying by representatives of the Department of Labor, or the Department of Health and Human Services, or States accorded jurisdiction under the Act. Access to the log is also provided to employees, former employees and their representatives.

#### II. Changes in Extent of or Outcome of Injury or Illness

If, during the 5-year period the log must be retained, there is a change in an extent and outcome of an injury or illness which affects entries in columns 1, 2, 6, 8, 9, or 13, the first entry should be lined out and a new entry made. For example, if an injured employee at first required only medical treatment but later lost workdays away from work, the check in column 6 should be lined out and checks entered in columns 2 and 3 and the number of lost workdays entered in column 4.

In another example, if an employee with an occupational illness lost wordays, returned to work, and then died of the illness, any entries in columns 9 through 12 would be lined out and the date of death entered in column 8.

The entire entry for an injury or illness should be lined out if later found to be nonrecordable. For example, an injury which is later determined not to be work related, or which was initially thought to involve medical treatement but later was determined to have involved only first aid.

#### **III. Posting Requirements**

A copy of the totals and information following the total line of the last page for the year, must be posted at each establishment in the place or places where notices to employees are customarily posted. This copy must be posted no later than February 1 and must remain in place until March 1. Even though there were no injuries or illnessed during the year, zeros must be entered on the totals line, and the form posted.

The person responsible for the annual summary totals shall certify that the totals are true and complete by signing at the bottom of the form.

IV. Instructions for Completing Log and Summary of Occupational injuries and illnesses

Column A - CASE OR FILE NUMBER. Self Expanatory

#### Column B - DATE OF INJURY OR ONSET OF ILLNESS

For occupational injuries, enter the date of the work accident which resulted in the injury. For occupational illnesses, enter the date of initial diagnosis of illness, or, if absence from work occurred before diagnosis, enter the first day of the absence attributable to the illness which was later diagnosed or recognized.

Columns C through F - Self Explanatory

Columns 1 and 8 - INJURY OR ILLNESS-RELATED DEATHS - Self Explanatory

# Columns 2 and 9 - INJURIES OR ILLNESSES WITH LOST WORKDAYS - Self Explanatory

Any injury which involves days away from work, or days of restricted work activitiy, or both, must be recorded since it always involves one or more of the criteria for recordability.

#### Columns 3 and 10 - INJURIES OR ILLNESSES INVOLVING DAYS AWAY FROM WORK - Self Explanatory

#### Columns 4 and 11 - LOST WORKDAYS -- DAYS AWAY FROM WORK.

Enter the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness. The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work. NOTE: For employees not having a regularly scheduled shift, such as certain truck drivers, construction workers, farm labor, casual labor, part-time employees, etc., it may be necessary to estimate the number of lost workdays. Estimates of lost workdays shall be based on prior work history of the employee AND days worked by employees, not ill or injured, working in the department and/or occupation of the ill or injured employee.

#### Columns 5 and 12 - LOST WORKDAYS -- DAYS OF RESTRICTED WORK ACTIVITY.

Enter the number of workdays (consecutive or not) on which because of injury or illness:

- (1) the employee was assigned to another job on a temporary basis, or
- (2) the employee worked at a permanent job less than full time, or
- (3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work.

#### Columns 6 and 13 - INJURIES OR ILLNESSES WITHOUT LOST WORKDAYS - Self Explanatory

#### Columns 7a through 7g - TYPE OF ILLNESS. Enter a check in only one column for each illness.

TERMINATION OR PERMANENT TRANSFER - Place an asterisk to the right of the entry in columns 7a through 7g (type of illness) which represented a termination of employment or permanent transfer.

#### V. Totals

Add number of entries in columns 1 and 8.

Add number of checks in columns 2, 3, 6, 7, 9, 10 and 13.

Add number of days in columns 4, 5, 11 and 12.

Yearly totals for each column (1-13) are required for posting. Running or page totals may be generated at the discretion of the employer.

In an employee's loss of workdays is continuing at the time the totals are summarized, estimate the number of future workdays the employee will lose and add that estimate to the workdays already lost and include this figure in the annual totals. No further entries are to be made with respect to such cases in the next year's log.

#### VI. Definitions

OCCUPATIONAL INJURY is any injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or from an exposure involving a single incident in the work environment. NOTE: Conditions resulting from animal bites, such as insect or snake bites or from one-time exposure to chemicals, are considered to be injuries.

OCCUPATIONAL ILLNESS of an amployee is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact.

The following listing gives the categories of occupational illnesses and disorders that will be utilized for the purpose of classifying recordable illnesses. For porposes of information, examples of each category are given. These are typical examples, however, and are not to be considered the complete listing of the types of illnesses and disorders that are to be counted under each category.

- 7a. Occupational Skin Diseases or Disorders. Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; chrome ulcers; chemical burns or inflamation, etc.
- 7b. Dust Diseases of the Lungs (Pneumaconioses). Examples: Silicosis, asbestosis and other asbestos-related diseases, coal worker's pneumaconioses, byssinosis, siderosis, and other pneumaconioses.
- 7c. Respiratory Conditions Due to Toxic Agents. Examples: Pneumonitis, pharyngitis, rhinitis or acute congestion due to chemicals, dusts, gases, or fumes; farmer's lung; etc.
- 7d. Poisoning (Systemic Effects of Toxic Materials). Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals; poisoning by

carbon monoxide, hydrogen sulfide, or other gases; poisoning by benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays such as parathion, lead arsenate; poisoning by other chemicals such as formaldehyde, plastics, and resins; etc.

- 7e. Disorders Due to Physical Agents (Other than Toxic Materials). Examples: Heatstroke, sunstroke, heat exhaustion, and other effects of environmental heat, freezing, frostbite, and effects of exposure to low temperatures; caisson disease; effects of ionizing radiation (isotopes, X-rays, radium); effects of nonionizing radiation (welding flash, ultraviolet rays, microwaves, sunburn); etc.
- 7f. Disorders Associated with Repeated Trauma. Examples: Noise-induced hearing loss; synovitis, tenosynovitis, and bursitis. Raynaud's phenomena; and other conditions due to repeated motion, vibration, or pressure.
- 7g. All Other Occupational Illnesses. Examples: Anthrax, brucellosis, infectious hepatitis, malignant and benign tumors, food poisoning, histoplasmosis, coccidioidomycosis, etc.

MEDICAL TREATMENT includes treatment (other than first aid) administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does NOT include first aid treatment (one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care) even though provided by a physician or registered professional personnel.

ESTABLISHMENT: A single physical location where business is conducted or where services or industrial operations are performed (for example: a factory, mill, store, hotel, resturant, movie theater, farm, ranch, bank, sales office, warehouse, or central administrative office). Where distinctly separate activities are performed at a single physicial location, such as construction activities operated from the same physical locations as a lumber yard, each activity shall be treated as a separate establishment.

For firms engaged in activities which may be physically dispersed, such as agriculture; construction; transportation; communications and electric, gas, and sanitary services, records may be maintained at a place to which employees report each day.

Records for personnel who do not primarily report or work at a single establishment, such as traveling salesmen, technicians, engineers, etc., shall be maintained at the location from which they are paid or the base from which personnel operate to carry out their activities.

WORK ENVIRONMENT is comprised of the physical location, equipment, materials processed or used, and the kinds of operations performed in the course of an employee's work, wether on or off the employer's premisis.

# Appendix D: MSDS Sheets

# **SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

Version 5.0 Revision Date 29.10.2012

Print Date 19.04.2017

GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

# 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers

Product name : Arsenic

Product Number : 267961
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, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Israel Ltd.

3 PARK RABIN, PLAUT 7670603 REHOVOT

ISRAEL

Telephone : +972 8948-4222 Fax : +972 8948-4200

1.4 Emergency telephone number

Emergency Phone # : +972 (8) 948-4222

# 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

# Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]

Acute aquatic toxicity (Category 1) Chronic aquatic toxicity (Category 1) Acute toxicity, Inhalation (Category 3) Acute toxicity, Oral (Category 3)

# Classification according to EU Directives 67/548/EEC or 1999/45/EC

Toxic by inhalation and if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

# 2.2 Label elements

# Labelling according Regulation (EC) No 1272/2008 [CLP]

Pictogram

Signal word Danger

Hazard statement(s)

H301 Toxic if swallowed. H331 Toxic if inhaled.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P273 Avoid release to the environment.

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/

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physician.

P311 Call a POISON CENTER or doctor/ physician.

P501 Dispose of contents/ container to an approved waste disposal plant.

Supplemental Hazard

Statements

none

# According to European Directive 67/548/EEC as amended.

Hazard symbol(s)

R-phrase(s)

R23/25 Toxic by inhalation and if swallowed.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in

the aquatic environment.

S-phrase(s)

S20/21 When using do not eat, drink or smoke.

S28 After contact with skin, wash immediately with plenty of soap and water.

S45 In case of accident or if you feel unwell, seek medical advice immediately

(show the label where possible).

S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/ Safety

data sheets.

#### 2.3 Other hazards - none

#### 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : As

Molecular Weight : 74,92 g/mol

| Component |              | Concentration |
|-----------|--------------|---------------|
| Arsenic   |              |               |
| CAS-No.   | 7440-38-2    | -             |
| EC-No.    | 231-148-6    |               |
| Index-No. | 033-001-00-X |               |
|           |              |               |

#### 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.

#### 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

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.

# 4.3 Indication of any immediate medical attention and special treatment needed

no data available

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#### 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

Arsenic oxides

# 5.3 Advice for firefighters

Wear self contained breathing apparatus for fire fighting 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 vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

## 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.

Provide appropriate exhaust ventilation at places where dust is formed.

# 7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

# 7.3 Specific end uses

no data available

# 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

## 8.1 Control parameters

Components with workplace control parameters

#### 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.

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The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Immersion protection Material: Nitrile rubber

Minimum layer thickness: 0,11 mm Break through time: > 480 min

Material tested:Dermatril® (Aldrich Z677272, Size M)

Splash protection Material: Nitrile rubber

Minimum layer thickness: 0,11 mm Break through time: > 30 min

Material tested:Dermatril® (Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 873000, 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 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 N99 (US) or type P2 (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).

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

# 9.1 Information on basic physical and chemical properties

a) Appearance Form: powder

Colour: grey

b) Odour no data availablec) Odour Threshold no data availabled) pH no data available

e) Melting point/freezing

point

Melting point/range: 817 °C - lit.

f) Initial boiling point and

. . . . . . . . .

613 °C - lit.

boiling range

) Flash point not applicable

h) Evaporation rate no data available

i) Flammability (solid, gas) no data available

Upper/lower flammability or explosive limits no data available

k) Vapour pressure no data available
 l) Vapour density no data available
 m) Relative density 5,727 g/mL at 25 °C

n) Water solubility no data available

) Partition coefficient: n-

no data available

octanol/water

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p) Autoignition no data available

temperature

q) Decomposition no data available

temperature

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

no data available

# 10.3 Possibility of hazardous reactions

no data available

#### 10.4 Conditions to avoid

Heat. Exposure to air may affect product quality.

# 10.5 Incompatible materials

Oxidizing agents, Halogens, Palladium undergoes a violent reaction with arsenic, Zinc, Platinum oxide, Nitrogen trichloride, Bromine azide

### 10.6 Hazardous decomposition products

Other decomposition products - no data available

### 11. TOXICOLOGICAL INFORMATION

# 11.1 Information on toxicological effects

# **Acute toxicity**

LD50 Oral - rat - 763 mg/kg

Remarks: Behavioral: Ataxia. Diarrhoea

LD50 Oral - mouse - 145 mg/kg

Remarks: Behavioral: Ataxia. Diarrhoea

Inhalation: 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

This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

IARC: 1 - Group 1: Carcinogenic to humans (Arsenic)

# Reproductive toxicity

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

#### Potential health effects

**Inhalation** Toxic if inhaled. May cause respiratory tract irritation.

**Ingestion** Harmful if swallowed.

**Skin** May be harmful if absorbed through skin. May cause skin irritation.

**Eyes** May cause eye irritation.

## Signs and Symptoms of Exposure

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.

# **Additional Information**

RTECS: CG0525000

#### 12. ECOLOGICAL INFORMATION

# 12.1 Toxicity

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 9,9 mg/l - 96,0 h

Toxicity to daphnia and

EC50 - Daphnia magna (Water flea) - 3,8 mg/l - 48 h

other aquatic invertebrates

#### 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

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. 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

# 14.1 UN number

ADR/RID: 1558 IMDG: 1558 IATA: 1558

#### 14.2 UN proper shipping name

ADR/RID: ARSENIC IMDG: ARSENIC IATA: Arsenic

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14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packaging group

ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards

ADR/RID: yes IMDG Marine pollutant: yes IATA: no

14.6 Special precautions for user

no data available

# 15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture no data available

#### 15.2 Chemical Safety Assessment

no data available

# 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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# **SAFETY DATA SHEET**

Revision Date 19-Jan-2018 Revision Number 3

1. Identification

Product Name 1,2-Benzanthracene

Cat No.: AC105250000; AC105250010; AC105252500

Synonyms Benzóa!anthracene; Tetraphene

**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 Acros Organics
One Reagent Lane One Reagent Lane
Fair Lawn, NJ 07410 Fair Lawn, NJ 07410

Tel: (201) 796-7100

**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)

Carcinogenicity Category 1B

**Label Elements** 

Signal Word

Danger

**Hazard Statements** 

May cause cancer



#### **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

Response

IF exposed or concerned: Get medical attention/advice

Storage

Store locked up

**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

WARNING. Cancer - https://www.p65warnings.ca.gov/.

# 3. Composition/Information on Ingredients

| Component         | CAS-No  | Weight % |  |
|-------------------|---------|----------|--|
| Benz[a]anthracene | 56-55-3 | 99       |  |

# 4. First-aid measures

Eye Contact Immediate medical attention is required. Rinse immediately with plenty of water, also under

the eyelids, for at least 15 minutes.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Immediate medical attention is required.

**Inhalation** Remove from exposure, lie down. Remove to fresh air. If not breathing, give artificial

respiration. Immediate medical attention is required.

**Ingestion** Call a physician immediately. Clean mouth with water.

Most important symptoms and

effects

No information available.

Notes to Physician Treat symptomatically

# 5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO2). Dry chemical. Chemical foam.

Unsuitable Extinguishing Media No information available

Flash Point No information available Method - No information available

**Autoignition Temperature** 

**Explosion Limits** 

Upper

Not applicable

No data available

Revision Date 19-Jan-2018 1,2-Benzanthracene

Lower No data available Sensitivity to Mechanical Impact No information available Sensitivity to Static Discharge No information available

#### **Specific Hazards Arising from the Chemical**

Do not allow run-off from fire-fighting to enter drains or water courses.

#### **Hazardous Combustion Products**

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>).

#### **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      | 1            | 0           | N/A              |
|        |              |             |                  |

# 6. Accidental release measures

**Personal Precautions Environmental Precautions**  Ensure adequate ventilation. Use personal protective equipment as required. 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 Sweep up and shovel into suitable containers for disposal. Up

|          | 7. Handling and storage  |
|----------|--|
| Handling | Do not breathe dust. Do not get in eyes, on skin, or on clothing. Handle product only in closed system or provide appropriate exhaust ventilation.                           |
| Storage  | Keep in a dry, cool and well-ventilated place. Refer product specification and/or product label for specific storage temperature requirement. Keep container tightly closed. |

# 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.

Ensure adequate ventilation, especially in confined areas. **Engineering Measures** 

#### **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.

Handle in accordance with good industrial hygiene and safety practice. **Hygiene Measures** 

#### Physical and chemical properties

Powder Solid **Physical State** 

AppearanceBeigeOdorOdorless

Odor Threshold

pH

No information available

No information available

Melting Point/Range 158 - 161 °C / 316.4 - 321.8 °F

Boiling Point/Range 437.6 °C / 819.7 °F Flash Point No information available Evaporation Rate Not applicable

Flammability (solid,gas)

No information available

Flammability or explosive limits

UpperNo data availableLowerNo data availableVapor PressureNo information availableVapor DensityNot applicable

Specific Gravity
Solubility
No information available
Partition coefficient; n-octanol/water
No data available
No data available

Autoignition Temperature Not applicable

**Decomposition Temperature**No information available

ViscosityNot applicableMolecular FormulaC18 H12Molecular Weight228.29

# 10. Stability and reactivity

Reactive Hazard None known, based on information available

**Stability** Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO2)

**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

Toxicologically Synergistic No information available

**Products** 

Delayed and immediate effects as well as chronic effects from short and long-term exposure

IrritationNo information availableSensitizationNo 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 |
|-------------------|---------|----------|-------------|-------|------|--------|
| Benz[a]anthracene | 56-55-3 | Group 2B | Reasonably  | A2    | X    | A2     |
|                   |         |          | Anticipated |       |      |        |

Mutagenic Effects Ames test: positive.

**Reproductive Effects**No information available.

**Developmental Effects**No information available.

**Teratogenicity** No information available.

**STOT - single exposure**STOT - repeated exposure
None known

Aspiration hazard No information available

Symptoms / effects,both acute and No information available

delayed

# **Endocrine Disruptor Information**

| Component         | EU - Endocrine Disrupters            | EU - Endocrine Disruptors - | Japan - Endocrine Disruptor |  |
|-------------------|--------------------------------------|-----------------------------|-----------------------------|--|
|                   | Candidate List                       | Evaluated Substances        | Information                 |  |
| Benz[a]anthracene | Benz[a]anthracene Group III Chemical |                             | Not applicable              |  |

Other Adverse Effects The toxicological properties have not been fully investigated.

# 12. Ecological information

#### **Ecotoxicity**

The product contains following substances which are hazardous for the environment. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

| Component         | Freshwater Algae | Freshwater Fish | Microtox                | Water Flea   |
|-------------------|------------------|-----------------|-------------------------|--|
| Benz[a]anthracene | Not listed       | Not listed      | EC50 = 0.26 mg/L 15 min | LC50: = 0.01 mg/L, 96h<br>Static (Daphnia magna)<br>EC50: = 0.0042 mg/L, 48h |
|                   |                  |                 |                         | (Daphnia magna)  |

Persistence and Degradability May persist

**Bioaccumulation/ Accumulation** No information available.

**Mobility** . Is not likely mobile in the environment due its low water solubility.

| Component         | log Pow |
|-------------------|---------|
| Benz[a]anthracene | 5.61    |

# 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 |  |  |
|-----------------------------|------------------------|------------------------|--|--|
| Benz[a]anthracene - 56-55-3 | U018                   | =                      |  |  |

# 14. Transport information

DOT Not regulated Not regulated

**IATA** 

JN-No UN3077

Proper Shipping Name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.\*

Hazard Class 9
Packing Group III

IMDG/IMO

UN-No UN3077

**Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.

Hazard Class 9
Packing Group III

# 15. Regulatory information

#### United States of America Inventory

| Component         | CAS-No  | TSCA | TSCA Inventory notification - Active/Inactive | TSCA - EPA Regulatory Flags |
|-------------------|---------|------|---|-----------------------------|
| Benz[a]anthracene | 56-55-3 | Χ    | ACTIVE  | -                           |

Legend:

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), Australia (AICS), China (IECSC), Korea (ECL).

|   | Component         | CAS-No  | DSL | NDSL | EINECS    | PICCS | ENCS | AICS | IECSC | KECL |
|---|-------------------|---------|-----|------|-----------|-------|------|------|-------|------|
| ı | Benz[a]anthracene | 56-55-3 | -   | X    | 200-280-6 | -     | -    | -    | Х     | -    |

# U.S. Federal Regulations

#### **SARA 313**

| Component         | CAS-No  | Weight % | SARA 313 - Threshold<br>Values % |
|-------------------|---------|----------|----------------------------------|
| Benz[a]anthracene | 56-55-3 | 99       | 0.1                              |

SARA 311/312 Hazard Categories See section 2 for more information

**CWA (Clean Water Act)** 

| Component CWA - Hazardous Substances |   | CWA - Reportable<br>Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |  |
|--------------------------------------|---|--------------------------------|------------------------|---------------------------|--|
| Benz[a]anthracene                    | - | -                              | -                      | X                         |  |

Clean Air Act Not applicable

**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 |  |
|-------------------|--------------------------|----------------|--|
| Benz[a]anthracene | 10 lb                    | -              |  |

California Proposition 65 This product contains the following Proposition 65 chemicals.

| Component         | CAS-No  | California Prop. 65 | Prop 65 NSRL | Category   |
|-------------------|---------|---------------------|--------------|------------|
| Benz[a]anthracene | 56-55-3 | Carcinogen          | 0.033 µg/day | Carcinogen |

# U.S. State Right-to-Know

Regulations

|   | Component         | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|-------------------|---------------|------------|--------------|----------|--------------|
| Γ | Benz[a]anthracene | X             | X          | X            | X        | Х            |

# **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

16. Other information

Prepared By Regulatory Affairs

Thermo Fisher Scientific

Email: EMSDS.RA@thermofisher.com

**Revision Date** 19-Jan-2018 **Print Date** 19-Jan-2018

**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**

Revision Date 14-Feb-2020 Revision Number 2

1. Identification

Product Name Benzo[a]pyrene

Cat No.: 15856

**CAS-No** 50-32-8

**Synonyms** Benzo[def]chrysene.; 3,4-Benzopyrene; 3,4-Benzpyrene

Recommended Use Laboratory chemicals.

Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660 Fax: 800-322-4757 **Email:** tech@alfa.com

www.alfa.com

**Emergency Telephone Number** 

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660.

After normal business hours, call Carechem 24 at (866) 928-0789.

# 2. Hazard(s) identification

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin SensitizationCategory 1Germ Cell MutagenicityCategory 1BCarcinogenicityCategory 1AReproductive ToxicityCategory 1B

# Label Elements

# Signal Word

Danger

#### **Hazard Statements**

May cause an allergic skin reaction

May cause genetic defects

May cause cancer

May damage fertility. May damage the unborn child



## **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

Avoid breathing dust/fume/gas/mist/vapors/spray

Contaminated work clothing should not be allowed out of the workplace

Wear protective gloves

### Response

IF exposed or concerned: Get medical attention/advice

### Skin

IF ON SKIN: Wash with plenty of soap and water

If skin irritation or rash occurs: Get medical advice/attention

Wash contaminated clothing before reuse

### Storage

Store locked up

### **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

WARNING. Cancer - https://www.p65warnings.ca.gov/.

# 3. Composition/Information on Ingredients

| Component      | CAS-No  | Weight % |
|----------------|---------|----------|
| Benzo[a]pyrene | 50-32-8 | > 96     |

# 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. Get medical attention if

symptoms occur.

Most important symptoms and

effects

None reasonably foreseeable. May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and

feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician Treat symptomatically

# 5. Fire-fighting measures

Unsuitable Extinguishing Media No information available

Flash Point No information available Method - No information available

**Autoignition Temperature** 

**Explosion Limits** 

Not applicable

Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

**Specific Hazards Arising from the Chemical** 

Do not allow run-off from fire-fighting to enter drains or water courses.

#### **Hazardous Combustion Products**

Carbon monoxide (CO). Carbon dioxide (CO2).

## **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

HealthFlammabilityInstabilityPhysical hazards210N/A

### 6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust

formation.

**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** Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed **Up** 

**5** 

## 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. Avoid dust formation.

**Storage** Keep containers tightly closed in a dry, cool and well-ventilated place.

## 8. Exposure controls / personal protection

### **Exposure Guidelines**

| Component      | ACGIH TLV | OSHA PEL                   | NIOSH IDLH | Mexico OEL (TWA) |
|----------------|-----------|----------------------------|------------|------------------|
| Benzo[a]pyrene |           | TWA: 0.2 mg/m <sup>3</sup> |            |                  |

### Legend

OSHA - Occupational Safety and Health Administration

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 StatePowder SolidAppearanceDark yellowOdoraromatic

Odor Threshold No information available

**pH** Not applicable

 Melting Point/Range
 175 - 179 °C / 347 - 354.2 °F

 Boiling Point/Range
 495 °C / 923 °F @ 760 mmHg

Flash Point No information available

Evaporation Rate Not applicable

Flammability (solid,gas)

No information available

Flammability or explosive limits

UpperNo data availableLowerNo data availableVapor PressureNo information available

Vapor Density Not applicable

Specific GravityNo information availableSolubilityInsoluble in waterPartition coefficient; n-octanol/waterNo data available

Autoignition Temperature Not applicable

**Decomposition Temperature**No information available

ViscosityNot applicableMolecular FormulaC20H12Molecular Weight252.31

# 10. Stability and reactivity

Reactive Hazard None known, based on information available

**Stability** Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Oxidizing agent

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO2)

**Hazardous Polymerization** Hazardous polymerization does not occur.

**Hazardous Reactions** None under normal processing.

# 11. Toxicological information

**Acute Toxicity** 

Product Information Component Information

Toxicologically Synergistic No information available

Products

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Revision Date 14-Feb-2020 Benzo[a]pyrene

Irritation No information available

Sensitization May cause sensitization by skin contact

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component      | CAS-No  | IARC    | NTP         | ACGIH | OSHA | Mexico |
|----------------|---------|---------|-------------|-------|------|--------|
| Benzo[a]pyrene | 50-32-8 | Group 1 | Reasonably  | A2    | X    | A2     |
|                |         |         | Anticipated |       |      |        |

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

A1 - Known Human Carcinogen ACGIH: (American Conference of Governmental Industrial

Hygienists)

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

No information available. **Developmental Effects** 

**Teratogenicity** No information available.

STOT - single exposure None known STOT - repeated exposure None known

No information available **Aspiration hazard** 

delayed

Symptoms / effects, both acute and Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

# **Endocrine Disruptor Information**

| Component      | EU - Endocrine Disrupters | EU - Endocrine Disruptors - | Japan - Endocrine Disruptor |
|----------------|---------------------------|-----------------------------|-----------------------------|
|                | Candidate List            | Evaluated Substances        | Information                 |
| Benzo[a]pyrene | Group III Chemical        | Not applicable              | Not applicable              |

**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.

Persistence and Degradability May persist

**Bioaccumulation/ Accumulation** No information available.

**Mobility** Is not likely mobile in the environment due its low water solubility.

| Component      | log Pow |
|----------------|---------|
| Benzo[a]pyrene | 6.06    |

## 13. Disposal considerations

Chemical waste generators must determine whether a discarded chemical is classified as a **Waste Disposal Methods** 

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 |
|--------------------------|------------------------|------------------------|
| Benzo[a]pyrene - 50-32-8 | U022                   | -                      |

# 14. Transport information

DOT

UN-No UN3077

Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.

Technical Name Benzo[a]pyrene

Hazard Class 9
Packing Group III

TDG

UN-No UN3077

**Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.

Hazard Class 9
Packing Group III

<u>IATA</u>

UN-No UN3077

Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.

Hazard Class 9
Packing Group III

IMDG/IMO

UN-No UN3077

Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.

Hazard Class 9
Packing Group III

# 15. Regulatory information

# **United States of America Inventory**

| Component      | CAS-No  | TSCA | TSCA Inventory notification - Active/Inactive | TSCA - EPA Regulatory<br>Flags |
|----------------|---------|------|---|--------------------------------|
| Benzo[a]pyrene | 50-32-8 | X    | ACTIVE  | -                              |

## Legend:

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), Australia (AICS), China (IECSC), Korea (ECL).

| Component      | CAS-No  | DSL | NDSL | EINECS    | PICCS | ENCS | AICS | IECSC | KECL       |
|----------------|---------|-----|------|-----------|-------|------|------|-------|------------|
| Benzo[a]pyrene | 50-32-8 | X   | 1    | 200-028-5 | X     | ı    | 1    | Χ     | KE-05-0184 |

# U.S. Federal Regulations

### **SARA 313**

| Component      | CAS-No  | Weight % | SARA 313 - Threshold<br>Values % |
|----------------|---------|----------|----------------------------------|
| Benzo[a]pyrene | 50-32-8 | > 96     | 0.1                              |

SARA 311/312 Hazard Categories See section 2 for more information

**CWA (Clean Water Act)** 

| CTTT (CTCAIT TTAICT TTCT) |                               |                                |                        |                           |
|---------------------------|-------------------------------|--------------------------------|------------------------|---------------------------|
| Component                 | CWA - Hazardous<br>Substances | CWA - Reportable<br>Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |
| Benzo[a]pyrene            | =                             | -                              | X                      | X                         |

Clean Air Act Not applicable

**OSHA** - Occupational Safety and

Health Administration

Not applicable

CERCLA Not applicable

| Component      | Hazardous Substances RQs | CERCLA EHS RQs |
|----------------|--------------------------|----------------|
| Benzo[a]pyrene | 1 lb                     | -              |

California Proposition 65 This product contains the following Proposition 65 chemicals.

|   | Component      | CAS-No  | California Prop. 65 | Prop 65 NSRL | Category   |
|---|----------------|---------|---------------------|--------------|------------|
| Γ | Benzo[a]pyrene | 50-32-8 | Carcinogen          | 0.06 μg/day  | Carcinogen |

# U.S. State Right-to-Know

Regulations

|   | Component      | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|----------------|---------------|------------|--------------|----------|--------------|
| Γ | Benzo[a]pyrene | Χ             | X          | Х            | X        | Χ            |

## **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

# 16. Other information

Prepared By Health, Safety and Environmental Department

Email: tech@alfa.com

www.alfa.com

Revision Date 14-Feb-2020

Print Date 14-Feb-2020

**Revision Summary** SDS authoring systems update, replaces ChemGes SDS No. 50-32-8/1.

## **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 Revision Date: 07/31/19

www.restek.com

2 Letter ISO country code/language code: US/EN

#### 1. IDENTIFICATION

Catalog Number / Product Name: 31272 / Benzo(b)fluoranthene Standard

Company:

Address:

Restek Corporation
110 Benner Circle
Bellefonte, Pa. 16823
Phone#:

814-353-1300

 Phone#:
 814-353-1300

 Fax#:
 814-353-1309

Emergency#: 800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)

Email: www.restek.com

Revision Number: 11

**Intended use:** For Laboratory use only

### 2. HAZARD(S)IDENTIFICATION

### **Emergency Overview:**







Symbols:

**GHS Hazard** 

GHS Carcinogenicity Category 1B Classification: Flammable Liquid Category 2

Serious Eye Damage/Eye Irritation Category 2

Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3

**GHS Signal** 

Word:

**GHS Hazard:** 

Danger

Highly flammable liquid and vapour.

Causes serious eye irritation. May cause drowsiness or dizziness.

May cause cancer.

**GHS** 

**Precautions:** 

**Safety** Obtain special instructions before use.

**Precautions:** 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/ventilation and lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge. Avoid breathing dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

First Aid Measures:

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position 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 or doctor/physician if you feel unwell.

If eye irritation persists: Get medical advice/attention.

In case of fire: Use extinguishing media in section 5 for extinction.

**Storage:** Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

**Disposal:** Dispose of contents/container according to section 13 of the SDS.

Single Exposure Specific target organ toxicity - Single exposure - STOT SE 3: H336 May cause drowsiness or dizziness.

Exposure Target Organs:

Repeated No data available

Exposure Target Organs:

### 3. COMPOSITION / INFORMATION ON INGREDIENT

| Chemical Name          | CAS#     | EINEC #   | % Composition |
|------------------------|----------|-----------|---------------|
| Acetone                | 67-64-1  | 200-662-2 | 99.9          |
| benzo (b) fluoranthene | 205-99-2 | 205-911-9 | 0.1           |

### 4. FIRST-AID MEASURES

**Inhalation:** Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not

breathing, give artificial respiration and have a trained individual administer oxygen. Get

medical attention immediately

Eyes: Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to

prevent chemical from transferring to the uncontaminated eye. Get immediate medical

attention.

**Skin Contact:** Wash with soap and water. Remove contaminated clothing and launder. Get medical

attention if irritation develops or persists.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two glasses of water

or milk to dilute. Provide medical care provider with this SDS.

### 5. FIRE- FIGHTING MEASURES

**Extinguishing Media:** Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing

agents. Water spray or fog may also be effective for extinguishing if swept across the base of the fire. Water can also be used to absorb heat and keep exposed material from being damaged by fire. Flammable component(s) of this material may be lighter than water and burn while

floating on the surface.

Fire and/or Explosion Hazards: Vapors may be ignited by heat, sparks, flames or other sources of

ignition at or above the low flash point giving rise to a Class B fire. Vapors are heavier than air and may travel to a source of ignition and

flash back

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self-contained

toxic breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may be lighter than water and burn while floating on the surface. Use water spray/fog for cooling. Flammable component(s) of this

material may be lighter than water and burn while floating on the surface.

Hazardous Combustion Products: Carbon dioxide, Carbon monoxide

#### 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Exposure to the spilled material may be irritating or harmful. Follow

personal protective equipment recommendations found in Section 8 of this SDS. Additional precautions may be necessary based on special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred. Also consider the

expertise of employees in the area responding to the spill.

Methods for Clean-up: Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal

### 7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Harmful or irritating material. Avoid contacting and avoid

breathing the material. Use only in a well ventilated area. Use

spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from

incompatible materials and conditions. Keep container(s)

closed. Keep away from sources of ignition

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| United States:<br>Chemical Name | CAS No.  | IDLH                          | ACGIH STEL                          | ACGIH TLV-TWA                  | OSHA Exposure<br>Limit          |
|---------------------------------|----------|-------------------------------|-------------------------------------|--------------------------------|---------------------------------|
| Acetone                         | 67-64-1  | 2500 ppm<br>IDLH (10%<br>LEL) | 750 ppm<br>STEL; 1782<br>mg/m3 STEL | 500 ppm TWA; 1188<br>mg/m3 TWA | 1000 ppm TWA;<br>2400 mg/m3 TWA |
| benzo (b)<br>fluoranthene       | 205-99-2 | Not established               | None Known                          | Not established                | No data available               |

**Personal Protection:** 

Engineering Measures: Local exhaust ventilation is recommended when generating excessive levels of

vapours from handling or thermal processing.

Respiratory Protection: No respiratory protection required under normal conditions of use. Provide

general room exhaust ventilation if symptoms of overexposure occur as explained

Section 3. A respirator is not normally required.

**Eye Protection:** Wear chemically resistant safety glasses with side shields when handling this

product. Do not wear contact lenses.

**Skin Protection:** Wear protective gloves. Inspect gloves for chemical break-through and replace at

regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when

leaving work

Medical Conditions Aggravated By Exposure: Respiratory disease including asthma and bronchitis

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance, color:** Depends upon product selection

Odor: Strong

Physical State:No data availablepH:Not applicableVapor Pressure:No data availableVapor Density:2.0 (air = 1)

**Boiling Point (°C):** 56.05 °C at 1013.25 hPa **Melting Point (°C):** -95.4 °C Melting Point

Flash Point (°F):

Flammability: Highly Flammable
Upper Flammable/Explosive Limit, % in air: No data available
Lower Flammable/Explosive Limit, % in air: No data available
Autoignition Temperature (°C): 465 deg C
Decomposition Temperature (°C): No data available
Specific Gravity: 0.7845 g/cm3 at 25 °C
Evaporation Rate: No data available

Odor Threshold: ND

Solubility: Complete; 100% Partition Coefficient: n-octanol in water: No data available

VOC % by weight: 99.9 Molecular Weight: 58.08

### 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: None known.

Materials to Avoid / Chemical Incompatiability:Strong oxidizing agents Strong acidsHazardous Decomposition Products:Carbon dioxide Carbon monoxide

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, Skin Contact, Eye Contact, Ingestion

Target Organs Potentially Affected By Exposure: Eyes, Central nervous system stimulation,

Respiratory Tract, Skin

Chemical Interactions That Change Toxicity: None Known

Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause minor respiratory irritation, dizziness, weakness, fatigue, nausea,

and headache.

**Skin Contact:** Can cause minor skin irritation, defatting, and dermatitis. **Eye Contact:** Can cause minor irritation, tearing and reddening.

**Ingestion Irritation:** May be harmful if swallowed.

**Ingestion Toxicity:** Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

**Carcinogenicity:** Contains a probable or known human carcinogen.

**Reproductive and Developmental Toxicity:**No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

**Inhalation:**Upon prolonged and/or repeated exposure, can cause minor respiratory irritation, dizziness, weakness, fatigue,

nausea, and headache.

Skin Contact: Upon prolonged or repeated contact, can cause minor

skin irritation, defatting, and dermatitis.

**Component Toxicological Data:** 

NIOSH:

Chemical Name CAS No. LD50/LC50

Acetone 67-64-1 Dermal LD50 Rabbit >15700 mg/kg; Inhalation

LC50 Rat 50100 mg/m3 8 h; Oral LD50 Rat

5800 mg/kg

**Component Carcinogenic Data:** 

OSHA:

Chemical Name CAS No.

Benzo(b)fluoranthene 205-99-2 Present

ACGIH:

Chemical Name CAS No.

Benzo[b]fluoranthene 205-99-2 A2 - Suspected Human Carcinogen

Acetone 67-64-1 A4 - Not Classifiable as a Human Carcinogen

NIOSH:

Chemical Name CAS No.

No data available

NTP:

Chemical Name CAS No.

No data available

IARC:

 Chemical Name
 CAS No.
 Group No.

 Monograph 92 [2010]:
 205-99-2
 Group 2B

Supplement 7 [1987]; Monograph

32 [1983]

12. ECOLOGICAL INFORMATION

**Overview:** This material is not expected to be harmful to the ecology.

Mobility:No dataPersistence:No dataBioaccumulation:No dataDegradability:No data

Ecological Toxicity Data: No data available

13. DISPOSAL CONSIDERATIONS

Waste Description of Spent Product: Spent or discarded material is a hazardous waste. Mixing

spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous

waste determination on mixtures.

**Disposal Methods:** Dispose of by incineration following Federal, State, Local,

or Provincial regulations.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial

Environmental Regulations.

### 14. TRANSPORTATION INFORMATION

**United States:** 

DOT Proper Shipping Name:
UN Number:
UN1090
Hazard Class:
Packing Group:

Acetone
UN1090
II

International:

IATA Proper Shipping Name:
UN Number:
UN1090
Hazard Class:
Packing Group:

II

Marine Pollutant: No

| Chemical Name     | CAS# | Marine Pollutant | Severe Marine<br>Pollutant |
|-------------------|------|------------------|----------------------------|
| No data available |      |                  |                            |

### 15. REGULATORY INFORMATION

| United States:<br>Chemical Name | CAS#     | CERCLA | SARA 313 | SARA EHS<br>313 | TSCA |
|---------------------------------|----------|--------|----------|-----------------|------|
| Acetone                         | 67-64-1  | Χ      | -        | -               | Χ    |
| benzo (b) fluoranthene          | 205-99-2 | Χ      | Χ        | -               | -    |

The following chemicals are listed on CA Prop 65:

| Chemical Name        | CAS#     | Regulation     |
|----------------------|----------|----------------|
| Benzo[b]fluoranthene | 205-99-2 | Prop 65 Cancer |

State Right To Know Listing:

| Chemical Name          | CAS#     | New Jersey | Massachusetts | Pennsylvania | California |
|------------------------|----------|------------|---------------|--------------|------------|
| Acetone                | 67-64-1  | X          | X             | Χ            | Χ          |
| benzo (b) fluoranthene | 205-99-2 | X          | X             | Χ            | Χ          |

### 16. OTHER INFORMATION

**Prior Version Date:** 08/13/18

Other Information: Any changes to the SDS compared to previous versions are marked by a vertical

line in front of the concerned paragraph.

References: No data available

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herein in good faith but makes no representation as to its comprehensiveness or accuracy. It is provided for your guidance only. Because many factors may affect processing or application/use, Restek Corporation recommends you perform an assessment to determine the suitability of a product for your particular purpose prior to use. No warranties of any kind, either expressed or implied, including fitness for a particular purpose, are made regarding products described, data or information set forth. In no case shall the descriptions, information, or data provided be considered a part of our terms and conditions of sale. Further, the descriptions, data and information furnished hereunder are given gratis. No obligation or liability for the description, data and information given are assumed. All such being given

and accepted at your risk.



## Safety Data Sheet Revision Date: 07/15/19

www.restek.com

2 Letter ISO country code/language code: US/EN

#### 1. IDENTIFICATION

Catalog Number / Product Name: 31274 / Benzo(k)fluoranthene Standard

Company:

Address:

Restek Corporation
110 Benner Circle
Bellefonte, Pa. 16823
Phone#:

814-353-1300

 Phone#:
 814-353-1300

 Fax#:
 814-353-1309

Emergency#: 800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)

Email: www.restek.com

Revision Number: 12

**Intended use:** For Laboratory use only

### 2. HAZARD(S)IDENTIFICATION

### **Emergency Overview:**

GHS Hazard Symbols:







GHS Carcinogenicity Category 1B Classification: Flammable Liquid Category 2

Serious Eye Damage/Eye Irritation Category 2

Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3

**GHS Signal** 

Word:

**GHS Hazard:** 

Danger

Highly flammable liquid and vapour. Causes serious eye irritation. May cause drowsiness or dizziness.

May cause cancer.

**GHS** 

**Precautions:** 

**Safety** Obtain special instructions before use.

**Precautions:** 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/ventilation and lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge. Avoid breathing dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

First Aid Measures:

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position 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 or doctor/physician if you feel unwell.

If eye irritation persists: Get medical advice/attention.

In case of fire: Use extinguishing media in section 5 for extinction.

**Storage:** Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

**Disposal:** Dispose of contents/container according to section 13 of the SDS.

Single Exposure Specific target organ toxicity - Single exposure - STOT SE 3: H336 May cause drowsiness or dizziness.

Exposure
Target Organs:

Repeated No data available

Exposure Target Organs:

### 3. COMPOSITION / INFORMATION ON INGREDIENT

| Chemical Name          | CAS#     | EINEC #   | % Composition |
|------------------------|----------|-----------|---------------|
| Acetone                | 67-64-1  | 200-662-2 | 99.9          |
| benzo (k) fluoranthene | 207-08-9 | 205-916-6 | 0.1           |

### 4. FIRST-AID MEASURES

**Inhalation:** Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not

breathing, give artificial respiration and have a trained individual administer oxygen. Get

medical attention immediately

**Eyes:** Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to

prevent chemical from transferring to the uncontaminated eye. Get immediate medical

attention.

Skin Contact: Wash with soap and water. Remove contaminated clothing and launder. Get medical

attention if irritation develops or persists.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two glasses of water

or milk to dilute. Provide medical care provider with this SDS.

### 5. FIRE- FIGHTING MEASURES

**Extinguishing Media:** Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing

agents. Water spray or fog may also be effective for extinguishing if swept across the base of the fire. Water can also be used to absorb heat and keep exposed material from being damaged by fire. Flammable component(s) of this material may be lighter than water and burn while

floating on the surface.

Fire and/or Explosion Hazards: Vapors may be ignited by heat, sparks, flames or other sources of

ignition at or above the low flash point giving rise to a Class B fire. Vapors are heavier than air and may travel to a source of ignition and

flash back

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self-contained

toxic breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may be lighter than water and burn while floating on the surface. Use water spray/fog for cooling. Flammable component(s) of this

material may be lighter than water and burn while floating on the surface.

Hazardous Combustion Products: Carbon dioxide, Carbon monoxide

#### 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Exposure to the spilled material may be irritating or harmful. Follow

personal protective equipment recommendations found in Section 8 of this SDS. Additional precautions may be necessary based on special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred. Also consider the

expertise of employees in the area responding to the spill.

Methods for Clean-up: Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal

### 7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Harmful or irritating material. Avoid contacting and avoid

breathing the material. Use only in a well ventilated area. Use

spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from

incompatible materials and conditions. Keep container(s)

closed. Keep away from sources of ignition

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| United States:<br>Chemical Name | CAS No.  | IDLH                          | ACGIH STEL                          | ACGIH TLV-TWA                  | OSHA Exposure<br>Limit          |
|---------------------------------|----------|-------------------------------|-------------------------------------|--------------------------------|---------------------------------|
| Acetone                         | 67-64-1  | 2500 ppm<br>IDLH (10%<br>LEL) | 750 ppm<br>STEL; 1782<br>mg/m3 STEL | 500 ppm TWA; 1188<br>mg/m3 TWA | 1000 ppm TWA;<br>2400 mg/m3 TWA |
| benzo (k)<br>fluoranthene       | 207-08-9 | Not established               | None Known                          | Not established                | No data available               |

**Personal Protection:** 

Engineering Measures: Local exhaust ventilation is recommended when generating excessive levels of

vapours from handling or thermal processing.

Respiratory Protection: No respiratory protection required under normal conditions of use. Provide

general room exhaust ventilation if symptoms of overexposure occur as explained

Section 3. A respirator is not normally required.

**Eye Protection:** Wear chemically resistant safety glasses with side shields when handling this

product. Do not wear contact lenses.

**Skin Protection:** Wear protective gloves. Inspect gloves for chemical break-through and replace at

regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when

leaving work

Medical Conditions Aggravated By Exposure: Respiratory disease including asthma and bronchitis

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance, color:** Depends upon product selection

Odor: Strong

Physical State:No data availablepH:Not applicableVapor Pressure:No data availableVapor Density:2.0 (air = 1)

**Boiling Point (°C):** 480 °C 56.05 °C at 1013.25 hPa

Melting Point (°C): -95.4 °C Melting Point

Flash Point (°F): 39

Flammability: Highly Flammable
Upper Flammable/Explosive Limit, % in air: No data available
Lower Flammable/Explosive Limit, % in air: No data available
Autoignition Temperature (°C): 465 deg C
Decomposition Temperature (°C): No data available
Specific Gravity: 0.7845 g/cm3 at 25 °C
Evaporation Rate: No data available

Odor Threshold: ND

Solubility: Complete; 100% Partition Coefficient: n-octanol in water: No data available

VOC % by weight: 99.9 Molecular Weight: 58.08

### 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: None known.

Materials to Avoid / Chemical Incompatiability: Strong oxidizing agents Strong acids Hazardous Decomposition Products: Carbon dioxide Carbon monoxide

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, Skin Contact, Eye Contact, Ingestion

Target Organs Potentially Affected By Exposure: Eyes, Central nervous system stimulation,

Respiratory Tract, Skin

Chemical Interactions That Change Toxicity: None Known

Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause minor respiratory irritation, dizziness, weakness, fatigue, nausea,

and headache.

**Skin Contact:** Can cause minor skin irritation, defatting, and dermatitis. **Eye Contact:** Can cause minor irritation, tearing and reddening.

**Ingestion Irritation:** May be harmful if swallowed.

Ingestion Toxicity: Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity: Contains a probable or known human carcinogen.

**Reproductive and Developmental Toxicity:**No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

Upon prolonged and/or repeated exposure, can cause minor respiratory irritation, dizziness, weakness, fatigue,

nausea, and headache.

Skin Contact: Upon prolonged or repeated contact, can cause minor

skin irritation, defatting, and dermatitis.

**Component Toxicological Data:** 

NIOSH:

Inhalation:

Chemical Name CAS No. LD50/LC50

Acetone 67-64-1 Dermal LD50 Rabbit >15700 mg/kg; Inhalation

LC50 Rat 50100 mg/m3 8 h; Oral LD50 Rat

5800 mg/kg

**Component Carcinogenic Data:** 

OSHA:

Chemical Name CAS No.

Benzo(k)fluoranthene 207-08-9 Present

ACGIH:

Chemical Name CAS No.

Acetone 67-64-1 A4 - Not Classifiable as a Human Carcinogen

NIOSH:

Chemical Name CAS No.

No data available

NTP:

Chemical Name CAS No.

No data available

IARC:

 Chemical Name
 CAS No.
 Group No.

 Monograph 92 [2010]:
 207-08-9
 Group 2B

Supplement 7 [1987]; Monograph

32 [1983]

12. ECOLOGICAL INFORMATION

**Overview:** This material is not expected to be harmful to the ecology.

Mobility:No dataPersistence:No dataBioaccumulation:No dataDegradability:No data

Ecological Toxicity Data: No data available

13. DISPOSAL CONSIDERATIONS

Waste Description of Spent Product: Spent or discarded material is a hazardous waste. Mixing

spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous

waste determination on mixtures.

Disposal Methods: Dispose of by incineration following Federal, State, Local,

or Provincial regulations.

Waste Disposal of Packaging:

Comply with all Local, State, Federal, and Provincial

Environmental Regulations.

### 14. TRANSPORTATION INFORMATION

**United States:** 

DOT Proper Shipping Name:
UN Number:
UN1090
Hazard Class:
Packing Group:

Acetone
UN1090
II

International:

IATA Proper Shipping Name:
UN Number:
UN1090
Hazard Class:
Packing Group:

Acetone
UN1090
II

Marine Pollutant: No

| Chemical Name     | CAS# | Marine Pollutant | Severe Marine<br>Pollutant |
|-------------------|------|------------------|----------------------------|
| No data available |      |                  |                            |

### 15. REGULATORY INFORMATION

| United States:<br>Chemical Name | CAS#     | CERCLA | SARA 313 | SARA EHS<br>313 | TSCA |  |
|---------------------------------|----------|--------|----------|-----------------|------|--|
| Acetone                         | 67-64-1  | Χ      | -        | -               | Χ    |  |
| benzo (k) fluoranthene          | 207-08-9 | Χ      | Χ        | -               | -    |  |

The following chemicals are listed on CA Prop 65:

| Chemical Name        | CAS#     | Regulation     |
|----------------------|----------|----------------|
| Benzo[k]fluoranthene | 207-08-9 | Prop 65 Cancer |

State Right To Know Listing:

| Chemical Name          | CAS#     | New Jersey | Massachusetts | Pennsylvania | California |
|------------------------|----------|------------|---------------|--------------|------------|
| Acetone                | 67-64-1  | X          | X             | Χ            | Χ          |
| benzo (k) fluoranthene | 207-08-9 | X          | Χ             | Χ            | Χ          |

### 16. OTHER INFORMATION

**Prior Version Date:** 06/15/18

Other Information: Any changes to the SDS compared to previous versions are marked by a vertical

line in front of the concerned paragraph.

References: No data available

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and accepted at your risk.

according to 29CFR1910/1200 and GHS Rev. 3

Effective date: 02.12.2015 Page 1 of 8

## Chloroform, Reagent Grade

# SECTION 1: Identification of the substance/mixture and of the supplier

Product name : Chloroform, Reagent Grade

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: S25248

Recommended uses of the product and uses restrictions on use:

**Manufacturer Details:** 

AquaPhoenix Scientific 9 Barnhart Drive, Hanover, PA 17331

## **Supplier Details:**

Fisher Science Education 15 Jet View Drive, Rochester, NY 14624

## **Emergency telephone number:**

Fisher Science Education Emergency Telephone No.: 800-535-5053

### **SECTION 2: Hazards identification**

#### Classification of the substance or mixture:



### **Health hazard**

Specific target organ toxicity following repeated exposure, category 1 Reproductive toxicity, category 2 Carcinogenicity, category 2



### Irritant

Acute toxicity (oral, dermal, inhalation), category 4 Skin irritation, category 2 Eye irritation, category 2A



### Toxic

Acute toxicity (oral, dermal, inhalation), category 3

Acute toxicity - Oral - Acute Tox. 4
Acute toxicity - Inhalation - Acute Tox. 3
Skin corrosion/irritation - Skin Irrit. 2.
Serious Eye Damage/Eye Irritation - Eye Irrit. 2
Carcinogenicity - Carc. 2
Reproductive Toxicity - Repr. 2
Specific target organ toxicity - Repeated exposure - STOT RE 1

Signal word : Danger

# Hazard statements:

Harmful if swallowed
Causes skin irritation
Causes serious eye irritation
Toxic if inhaled
Suspected of causing cancer
Suspected of damaging fertility or the unborn child

according to 29CFR1910/1200 and GHS Rev. 3

**Effective date**: 02.12.2015 Page 2 of 8

## Chloroform, Reagent Grade

Causes damage to organs through prolonged or repeated exposure

## Precautionary statements:

If medical advice is needed, have product container or label at hand

Keep out of reach of children

Read label before use

Do not handle until all safety precautions have been read and understood

Obtain special instructions before use

Avoid breathing dust/fume/gas/mist/vapours/spray

Use only outdoors or in a well-ventilated area

Use personal protective equipment as required

Wash skin thoroughly after handling

Do not eat, drink or smoke when using this product

Wear protective gloves/protective clothing/eye protection/face protection

Call a POISON CENTER or doctor/physician

If skin irritation occurs: Get medical advice/attention

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

IF exposed or concerned: Get medical advice/attention

Get Medical advice/attention if you feel unwell

Specific treatment (see supplemental first aid instructions on this label)

Rinse mouth

Take off contaminated clothing and wash before reuse

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

IF ON SKIN: Wash with soap and water

Store in a well ventilated place. Keep container tightly closed

Store locked up

Dispose of contents and container as instructed in Section 13

### Other Non-GHS Classification:

## **WHMIS**





### NFPA/HMIS





HMIS RATINGS (0-4)

## SECTION 3: Composition/information on ingredients

according to 29CFR1910/1200 and GHS Rev. 3

**Effective date**: 02.12.2015 Page 3 of 8

## Chloroform, Reagent Grade

| Ingredients: |            |                           |
|--------------|------------|---------------------------|
| CAS 67-66-3  | Chloroform | 100 %                     |
|              |            | Percentages are by weight |

## **SECTION 4: First aid measures**

## **Description of first aid measures**

**After inhalation:** Loosen clothing as necessary and position individual in a comfortable position. Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen. Get medical assistance if cough or other symptoms appear. DO NOT use mouth-to-mouth resuscitation

**After skin contact:** Rinse/flush exposed skin gently using soap and water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

**After eye contact:** Protect unexposed eye.Rinse/flush exposed eye(s) gently using water for 15-20 minutes.Remove contact lens(es) if able to do so during rinsing.Seek medical attention if irritation persists or if concerned.

**After swallowing:** Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists. Never give anything by mouth to an unconscious person. Call Poison Control immediately

### Most important symptoms and effects, both acute and delayed:

Aspiration hazard. May cause central nervous system effects. May cause gastrointestinal irritation, nausea, vomiting and diarrhea. Irritation- all routes of exposure. May cause irritation of respiratory tract. Inhalation may cause central nervous system effects. Headache. Shortness of breath.; Possible cancer hazard. Tumorigenic effects have been reported in experimental animals. May cause adverse liver and kidney effects. Central nervous system disorders. Cardiovascular. Preexisting eye disorders. Kidney disorders. Liver disorders. Skin disorders

### Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

# **SECTION 5 : Firefighting measures**

### Extinguishing media

**Suitable extinguishing agents:** Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

## For safety reasons unsuitable extinguishing agents:

### **Special hazards arising from the substance or mixture:**

Thermal decomposition can lead to release of irritating gases and vapors. Slight fire hazard when subjected to high heat

## Advice for firefighters:

**Protective equipment:** Wear protective eyeware, gloves, and clothing. Refer to Section 8.Use NIOSH-approved respiratory protection/breathing apparatus.

**Additional information (precautions):** Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

### **SECTION 6: Accidental release measures**

## Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that air-handling systems are operational.

## **Environmental precautions:**

according to 29CFR1910/1200 and GHS Rev. 3

**Effective date**: 02.12.2015 Page 4 of 8

## Chloroform, Reagent Grade

Should not be released into environment. Prevent from reaching drains, sewer, or waterway.

## Methods and material for containment and cleaning up:

Wear protective eyeware, gloves, and clothing. Refer to Section 8.Always obey local regulations. Containerize for disposal. Refer to Section 13.If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

### Reference to other sections:

## SECTION 7: Handling and storage

# Precautions for safe handling:

Avoid contact with skin, eyes, and clothing. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke, or use personal products when handling chemical substances.

## Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages. Protect from freezing and physical damage. Provide ventilation for containers. Keep container tightly sealed. Store away from incompatible materials.

### **SECTION 8 : Exposure controls/personal protection**





**Control Parameters:** 67-66-3, Chloroform, ACGIH TLV: 49 mg/m3

67-66-3, Chloroform, OSHA PEL: 240 mg/m3

67-66-3. Chloroform, OSHA PEL 50 ppm Ceiling: 240 mg/m3 Ceiling

67-66-3, Chloroform, ACGIH TLV TWA:10 ppm TWA

67-66-3, Chloroform, NIOSH REL: Ca ST 2 ppm (9.78 mg/m3) 60-minute

67-66-3, Chloroform, NIOSH IDLH: Ca 500 ppm

**Appropriate Engineering controls:** Emergency eye wash fountains and safety showers should be available in

the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational

Exposure Limits-OELs) indicated above.

**Respiratory protection:** Not required under normal conditions of use. 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. When necessary use NIOSH approved

breathing equipment.

**Protection of skin:** Select glove material impermeable and resistant to the substance. Select

glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear

protective clothing.

**Eye protection:** Wear equipment for eye protection tested and approved under

appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses or goggles are appropriate eye protection.

according to 29CFR1910/1200 and GHS Rev. 3

**Effective date**: 02.12.2015 Page 5 of 8

# Chloroform, Reagent Grade

General hygienic measures:

Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing. Before wearing wash contaminated clothing.

## SECTION 9: Physical and chemical properties

| Appearance (physical state,color): | Clear Liquid                       | Explosion limit lower:<br>Explosion limit upper: | Not determined<br>Not determined                                |
|------------------------------------|------------------------------------|--|---|
| Odor:                              | Aromatic Chloroform Odor           | Vapor pressure:                                  | 213 mbar @ 20 °C  |
| Odor threshold:                    | Not determined                     | Vapor density:                                   | 4.12 (Air = 1.0)  |
| pH-value:                          | Not determined                     | Relative density:                                | Not determined  |
| Melting/Freezing point:            | -63°C / -81.4°F                    | Solubilities:                                    | Slightly soluble  |
| Boiling point/Boiling range:       | 60.5 - 61.5°C / 140.9 -<br>142.7°F | Partition coefficient (noctanol/water):          | Not determined  |
| Flash point (closed cup):          | Not determined                     | Auto/Self-ignition temperature:                  | Not determined  |
| Evaporation rate:                  | 11.6 (Butyl Acetate = 1.0)         | Decomposition temperature:                       | 290°C   |
| Flammability<br>(solid,gaseous):   | Not determined                     | Viscosity:                                       | a. Kinematic:Not<br>determined<br>b. Dynamic: Not<br>determined |

**Density**: Not determined **Specific Gravity**:1.480

# **SECTION 10: Stability and reactivity**

**Reactivity:** Nonreactive under normal conditions.

**Chemical stability:**Stable under normal conditions.Light sensitive **Possible hazardous reactions:**None under normal processing. **Conditions to avoid:**Incompatible materials.Excess heat

**Incompatible materials:**Alkali metals, strong caustics and oxidizers

Hazardous decomposition products: Oxides of sodium. Emits very toxic fumes of chlorine and phosgene gas

# **SECTION 11: Toxicological information**

| Acute Toxicity:      |  |   |  |  |  |
|----------------------|--|---|--|--|--|
| Oral:                | 67-66-3  | LD50 oral-rat: 695mg/kg   |  |  |  |
| Chronic Toxicity:    |  |   |  |  |  |
| Inhalation:          | 67-66-3  | May cause adverse liver effects. May cause adverse kidney effects |  |  |  |
| Corrosion Irritation | Corrosion Irritation: No additional information. |   |  |  |  |
| Sensitization:       |  | No additional information.  |  |  |  |

according to 29CFR1910/1200 and GHS Rev. 3

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### Chloroform, Reagent Grade

| Single Target Organ (STOT):                    | No additional information.   |
|--|--|
| Numerical Measures: No additional information. |  |
| Carcinogenicity:                               | Possible cancer hazard based on tests with laboratory animals.: Tumorigenic effects have been reported in experimental animals OSHA: Carcinogen (67-66-3)  |
| Mutagenicity:                                  | Mutagenic effects have occurred in experimental animals  |
| Reproductive Toxicity:                         | Experiments have shown reproductive toxicity effects on laboratory animals. Developmental effects have occurred in experimental animals. Teratogenic effects have occurred in experimental animals |

# **SECTION 12: Ecological information**

## **Ecotoxicity Persistence and degradability:**

**Bioaccumulative potential**: **Mobility in soil**: log Pow: 2

Other adverse effects: Chloroform has moderate acute and chronic toxicity to aquatic life, especially brittle roots

and chromosomal damage

### **SECTION 13: Disposal considerations**

### Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material.U.S. - RCRA (Resource Conservation & Recovery Act) - U Series Wastes - Acutely Toxic Wastes & Other Hazardous Characteristics waste number U044 (Chloroform) . U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII Included in waste streams: F024, F025, F039, K009, K010, K019, K020, K021, K029, K073, K116, K149, K150, K151, K158 (Chloroform) . U.S. - RCRA (Resource Conservation & Recovery Act) - D Series Wastes - Max Conc of Contaminants for the Tox Characteristic 6.0 mg/L regulatory level (Chloroform) . Dispose of empty containers as unused product.Product or containers must not be disposed with household garbage. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). 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. Ensure complete and accurate classification.

## **SECTION 14: Transport information**

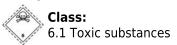
### **UN-Number**

1888

# **UN proper shipping name**

Poisonous material, Chloroform

### **Transport hazard class(es)**



Packing group: III

according to 29CFR1910/1200 and GHS Rev. 3

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## Chloroform, Reagent Grade

**Environmental hazard:** 

Transport in bulk:

Special precautions for user:

# **SECTION 15: Regulatory information**

## **United States (USA)**

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

67-66-3 Chloroform 0.1 % de minimis concentration

RCRA (hazardous waste code):

67-66-3 Chloroform waste codeU044

TSCA (Toxic Substances Control Act):

All ingredients are listed.

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)**:

67-66-3 Chloroform

### Proposition 65 (California):

Chemicals known to cause cancer:

67-66-3 Chloroform

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:

67-66-3 Chloroform

## Canada

### Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

67-66-3 Chloroform

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

## **SECTION 16: Other information**

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this

according to 29CFR1910/1200 and GHS Rev. 3

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# Chloroform, Reagent Grade

material.

### **GHS Full Text Phrases:**

### Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

CFR: Code of Federal Regulations (USA)

SARA: Superfund Amendments and Reauthorization Act (USA)

RCRA: Resource Conservation and Recovery Act (USA)

TSCA: Toxic Substances Control Act (USA)

NPRI: National Pollutant Release Inventory (Canada)

DOT: US Department of Transportation

**Effective date** : 02.12.2015 **Last updated** : 03.19.2015



Material Safety Data Sheet

Chrysene, 98%

MSDS# 95251

Section 1 - Chemical Product and Company Identification

MSDS Name: Chrysene, 98%

Catalog Numbers: AC224140000, AC224140010, AC224140050, AC224145000

Synonyms: 1,2-Benzophenanthrene; Benzo(a)phenanthrene; 1,2,5,6-Dibenzonaphthalene.

Acros Organics BVBA

Company Identification: Janssen Pharmaceuticalaan 3a

2440 Geel, Belgium

**Acros Organics** 

Company Identification: (USA)

One Reagent Lane

Fair Lawn, NJ 07410

For information in the US, call:

For information in Europe, call:

Emergency Number, Europe:

Emergency Number US:

201-796-7100

CHEMTREC Phone Number, US: 800-424-9300 CHEMTREC Phone Number, Europe: 703-527-3887

Section 2 - Composition, Information on Ingredients

-----

CAS#: 218-01-9 Chemical Name: Chrysene

%: 98

EINECS#: 205-923-4

-----

Hazard Symbols: T



Risk Phrases: 45 50/53

Section 3 - Hazards Identification

**EMERGENCY OVERVIEW** 

Caution! May cause respiratory tract irritation. May cause eye and skin irritation. May cause cancer in humans. Target Organs: Liver, skin.

Potential Health Effects

Eye: May cause eye irritation.
Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower

eyelids. Get medical aid.

Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing Skin:

contaminated clothing and shoes. Wash clothing before reuse.

Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give Ingestion:

anything by mouth to an unconscious person. Get medical aid immediately.

Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, Inhalation:

give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician:

General

Section 5 - Fire Fighting Measures

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved

or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is

capable of creating a dust explosion.

Extinguishing Media:

Information:

Use water spray, dry chemical, carbon dioxide, or chemical foam.

Autoignition Not available. Temperature:

Flash Point: Not applicable.

Explosion Not available Limits: Lower:

Explosion Not available Limits: Upper:

NFPA Rating: health: ; flammability: 1; instability: ;

Section 6 - Accidental Release Measures

General

Information:

Use proper personal protective equipment as indicated in Section 8.

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately,

Spills/Leaks:

observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

# Section 8 - Exposure Controls, Personal Protection

| Chemical Name | +  | +<br>  NIOSH | ++<br> OSHA - Final PELs               |
|---------------|--|--------------|--|
| Chrysene      | 0.2 mg/m3 TWA (as  benzene soluble  aerosol) (listed  under Coal tar   pitches). | <br>         | 0.2 mg/m3 TWA     (benzene     soluble |

OSHA Vacated PELs: Chrysene: 0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches) **Engineering Controls:** 

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

**Exposure Limits** 

Personal Protective Equipment

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face Eyes:

protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a

Respirators: NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if

irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Color: very light beige Odor: Not available pH: Not available

Vapor Pressure: Not available Vapor Density: Not available Evaporation Rate: Not available Viscosity: Not available

Boiling Point: 448 deg C @ 760 mm Hg ( 838.40°F)

Freezing/Melting Point: 250-255 deg C Decomposition Temperature: Not available

Solubility in water: insoluble

Specific Gravity/Density:

Molecular Formula: C18H12 Molecular Weight: 228.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials Not available

Hazardous Decomposition Products Carbon monoxide, carbon dioxide.

Hazardous Polymerization Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 218-01-9: GC0700000

LD50/LC50: RTECS: Not available.

Carcinogenicity: Chrysene - ACGIH: A1 - Confirmed Human Carcinogen (Coal tar pitches). California: carcinogen, initial

date 1/1/90 NTP: Known carcinogen (Coal tar pitches). IARC: Group 1 carcinogen (Coal tar pitches).

Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

**US DOT** 

Shipping Name: Please contact Fisher Scientific for shipping information

Hazard Class: UN Number: Packing Group: Canada TDG

Shipping Name: Not available

Hazard Class: UN Number: Packing Group:

USA RQ: CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

# Safety Phrases:

- S 53 Avoid exposure obtain special instructions before use.
- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: Not available

### Canada

CAS# 218-01-9 is listed on Canada's DSL List

Canadian WHMIS Classifications: D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 218-01-9 is listed on Canada's Ingredient Disclosure List

### **US Federal**

**TSCA** 

CAS# 218-01-9 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 6/30/1999 Revision #6 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility 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 the company 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 the company has been advised of the possibility of such damages.

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Safety Data Sheet Revision Date: 10/02/19

www.restek.com

2 Letter ISO country code/language code: US/EN

#### 1. IDENTIFICATION

Catalog Number / Product Name: 31276 / Dibenzo(a,h)anthracene Standard

Company: **Restek Corporation** Address: 110 Benner Circle Bellefonte, Pa. 16823 Phone#: 814-353-1300 Fax#: 814-353-1309

Emergency#: 800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)

Email: www.restek.com

**Revision Number:** 9

Intended use: For Laboratory use only

# 2. HAZARD(S)IDENTIFICATION

### **Emergency Overview:**



**GHS Hazard** Symbols:

**GHS** Carcinogenicity Category 2

Classification:

**GHS Signal** Warning

Word:

**GHS Hazard:** Suspected of causing cancer.

**GHS** 

**Precautions:** 

Safety Obtain special instructions before use.

Precautions: Do not handle until all safety precautions have been read and understood.

Wear protective gloves/protective clothing/eye protection/face protection.

First Aid IF exposed or concerned: Get medical advice/attention.

Measures:

Storage: Store locked up.

Disposal: Dispose of contents/container according to section 13 of the SDS.

No data available Single

Exposure **Target Organs:** 

Repeated No data available

**Exposure** 

**Target Organs:** 

### 3. COMPOSITION / INFORMATION ON INGREDIENT

| Chemical Name           | CAS#    | EINEC #   | % Composition |
|-------------------------|---------|-----------|---------------|
| Dichloromethane         | 75-09-2 | 200-838-9 | 99.9          |
| dibenz (a,h) anthracene | 53-70-3 | 200-181-8 | 0.1           |

### 4. FIRST-AID MEASURES

**Inhalation:** Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not

breathing, give artificial respiration and have a trained individual administer oxygen. Get

medical attention immediately

**Eyes:** Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often.

Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical

attention

**Skin Contact:** Wash with soap and water. Remove contaminated clothing, launder immediately, and discard

contaminated leather goods. Get medical attention immediately.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two glasses of water

or milk to dilute. Provide medical care provider with this SDS. Never give anything by mouth

to an unconscious person

### 5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical when fighting

fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use

methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: No data.

**Fire Fighting Methods and Protection:** Use methods for the surrounding fire. **Hazardous Combustion Products:** Carbon dioxide, Carbon monoxide

#### 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Exposure to the spilled material may be severely irritating or toxic. Follow

personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure

limits.

Methods for Clean-up: Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal

evaluation.

### 7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid

breathing the material. Use only in a well ventilated area. As with all chemicals, good industrial hygiene practices should be

followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials.

Keep container closed when not in use

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| United States:<br>Chemical Name | CAS No. | IDLH               | ACGIH STEL | ACGIH TLV-TWA   | OSHA Exposure<br>Limit                       |
|---------------------------------|---------|--------------------|------------|-----------------|--|
| Dichloromethane                 | 75-09-2 | 2300 ppm<br>IDLH   | None Known | 50 ppm TWA      | 25 ppm TWA; 125<br>ppm STEL (15 min.<br>TWA) |
| dibenz (a,h)<br>anthracene      | 53-70-3 | Not<br>established | None Known | Not established | No data available                            |

**Personal Protection:** 

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required

when handling or using this product to avoid overexposure.

Respiratory Protection: Respiratory protection may be required to avoid overexposure when handling this

product. General or local exhaust ventilation is the preferred means of protection.

Use a respirator if general room ventilation is not available or sufficient to

eliminate symptoms.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this

product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash

station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other

protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and

water before eating, drinking, and when leaving work.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory

disease including asthma and bronchitis

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color: Colorless Odor: Strong

Physical State:

pH:

No data available

Not applicable

No data available

Vapor Pressure:

Vapor Density:

Boiling Point (°C):

No data available

2.93 (air = 1)

524 °C Boiling Point

Melting Point (°C): -96.7 °C

Flash Point (°F):

Upper Flammable/Explosive Limit, % in air:

Lower Flammable/Explosive Limit, % in air:

Autoignition Temperature (°C):

Decomposition Temperature (°C):

No data available

556 deg C

No data available

**Specific Gravity:** 1.3254 - 1.3258 g/cm3 at 20 °C

**Evaporation Rate:**No data available

Odor Threshold: ND

Solubility: Moderate; 50-99% Partition Coefficient: n-octanol in water: No data available

VOC % by weight: 99.9

Molecular Weight: No data available

### 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid:

Materials to Avoid / Chemical Incompatiability:
Hazardous Decomposition Products:

None known.Contamination High temperatures Strong oxidizing agents Caustics (bases)
Carbon dioxide Carbon monoxide

### 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation Absorption Ingestion Skin contact Eye

contact

Target Organs Potentially Affected By Exposure: Skin, Cardiovascular System, Eyes, Liver

Chemical Interactions That Change Toxicity: None Known

### Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea

and headache.

Inhalation Toxicity: Harmful! Can cause systemic damage (see "Target Organs)Inhalation may

cause severe central nervous system depression (including unconsciousness).

**Skin Contact:** Contact causes severe skin irritation and possible burns.

Skin Absorption: Harmful if absorbed through the skin. May cause severe irritation and systemic

damage.

**Eye Contact:** Contact with the eyes may cause moderate to severe eye injury. Eye contact

may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.

Ingestion Irritation: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort,

nausea, vomiting and diarrhea.

**Ingestion Toxicity:** Harmful if swallowed. May cause systemic poisoning.

### Long-Term (Chronic) Health Effects:

Carcinogenicity: Contains a probable or known human carcinogen.

Reproductive and Developmental Toxicity: No data available to indicate product or any components

present at greater than 0.1% may cause birth defects.

Inhalation:

Upon prolonged and/or repeated exposure, can cause

Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue,

nausea and headache.Harmful! Can cause systemic damage upon prolonged and/or repeated exposure (see

"Target Organs)

Skin Absorption: Upon prolonged or repeated exposure, harmful if

absorbed through the skin. May cause severe irritation

and systemic damage

**Component Toxicological Data:** 

NIOSH:

Chemical Name CAS No. LD50/LC50

Methane, dichloro- 75-09-2 Inhalation LC50 Rat 53 mg/L 6 h

**Component Carcinogenic Data:** 

OSHA:

Chemical Name CAS No.

Dibenz[a,h]anthracene 53-70-3 Present
Methylene chloride 75-09-2 25 ppm TWA (8 hr.); 125 ppm STEL (15 min.);

12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910

Specifically Regulate

ACGIH:

Chemical Name CAS No.

Dichloromethane 75-09-2 A3 - Confirmed Animal Carcinogen with

Unknown Relevance to Humans

NIOSH:

Chemical Name CAS No.

Methylene chloride 75-09-2 potential occupational carcinogen

NTP:

Chemical Name CAS No.

No data available

IARC:

 Chemical Name
 CAS No.
 Group No.

 Monograph 92 [2010];
 53-70-3
 Group 2A

Supplement 7 [1987]; Monograph 32 [1983] (overall evaluation upgraded from 2B to 2A with supporting evidence from other

relevant data)

Monograph 110 [in preparation]: 75-09-2 Group 2A

Monograph 71 [1999]

12. ECOLOGICAL INFORMATION

Overview: Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility:No dataPersistence:No dataBioaccumulation:No dataDegradability:No data

Ecological Toxicity Data: No data available

13. DISPOSAL CONSIDERATIONS

Waste Description of Spent Product: Spent or discarded material is a hazardous waste. Mixing

spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous

waste determination on mixtures.

Disposal Methods: Incinerate spent or discarded material a permitted

hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial

Environmental Regulations.

### 14. TRANSPORTATION INFORMATION

**United States:** 

**DOT Proper Shipping Name:** Dichloromethane

UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Dichloromethane

UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

| Chemical Name     | CAS# | Marine Pollutant | Severe Marine<br>Pollutant |
|-------------------|------|------------------|----------------------------|
| No data available |      |                  |                            |

### 15. REGULATORY INFORMATION

| United States:<br>Chemical Name | CAS#    | CERCLA | SARA 313 | SARA EHS<br>313 | TSCA |  |
|---------------------------------|---------|--------|----------|-----------------|------|--|
| Dichloromethane                 | 75-09-2 | Χ      | Χ        | -               | Χ    |  |
| dibenz (a,h) anthracene         | 53-70-3 | Χ      | Χ        | -               | Χ    |  |

The following chemicals are listed on CA Prop 65:

| The femality discussions are noted on extrap out |         |                |  |  |
|--|---------|----------------|--|--|
| Chemical Name                                    | CAS#    | Regulation     |  |  |
| Dibenz[a,h]anthracene                            | 53-70-3 | Prop 65 Cancer |  |  |
| Dichloromethane                                  | 75-09-2 | Prop 65 Cancer |  |  |
| Dichloromethane (Methylene chloride)             |         |                |  |  |

State Right To Know Listing:

| Chemical Name           | CAS#    | New Jersey | Massachusetts | Pennsylvania | California |
|-------------------------|---------|------------|---------------|--------------|------------|
| Dichloromethane         | 75-09-2 | X          | X             | Χ            | Χ          |
| dibenz (a.h) anthracene | 53-70-3 | X          | X             | Χ            | Χ          |

### 16. OTHER INFORMATION

Prior Version Date: 06/20/18

Other Information: Any changes to the SDS compared to previous versions are marked by a vertical

line in front of the concerned paragraph.

References: No data available

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and accepted at your risk.



# Safety Data Sheet Revision Date: 06/04/19

www.restek.com

2 Letter ISO country code/language code: US/EN

#### 1. IDENTIFICATION

Catalog Number / Product Name: 31279 / Indeno(1,2,3-c,d)pyrene Standard

Company: **Restek Corporation** Address: 110 Benner Circle Bellefonte, Pa. 16823 Phone#: 814-353-1300 Fax#: 814-353-1309

Emergency#: 800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)

Email: www.restek.com

**Revision Number:** 11

Intended use: For Laboratory use only

# 2. HAZARD(S)IDENTIFICATION

### **Emergency Overview:**



**GHS Hazard** Symbols:

**GHS** Carcinogenicity Category 2

Classification:

**GHS Signal** Warning

Word:

**GHS Hazard:** Suspected of causing cancer.

**GHS** 

**Precautions:** 

Safety Obtain special instructions before use.

Precautions: Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.

First Aid IF exposed or concerned: Get medical advice/attention.

Measures:

Storage: Store locked up.

Disposal: Dispose of contents/container according to section 13 of the SDS.

No data available Single

Exposure **Target Organs:** 

Repeated No data available

**Exposure** 

**Target Organs:** 

## 3. COMPOSITION / INFORMATION ON INGREDIENT

| Chemical Name             | CAS#     | EINEC #   | % Composition |
|---------------------------|----------|-----------|---------------|
| Dichloromethane           | 75-09-2  | 200-838-9 | 99.9          |
| indeno (1,2,3-c,d) pyrene | 193-39-5 | 205-893-2 | 0.1           |

### 4. FIRST-AID MEASURES

**Inhalation:** Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not

breathing, give artificial respiration and have a trained individual administer oxygen. Get

medical attention immediately

**Eyes:** Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often.

Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical

attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard

contaminated leather goods. Get medical attention immediately.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two glasses of water

or milk to dilute. Provide medical care provider with this SDS. Never give anything by mouth

to an unconscious person

### 5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical when fighting

fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use

methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: No data.

**Fire Fighting Methods and Protection:** Use methods for the surrounding fire. **Hazardous Combustion Products:** Use methods for the surrounding fire. Carbon dioxide, Carbon monoxide

#### 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Exposure to the spilled material may be severely irritating or toxic. Follow

personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure

limits.

**Methods for Clean-up:** Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal

evaluation.

### 7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid

breathing the material. Use only in a well ventilated area. As with all chemicals, good industrial hygiene practices should be

followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials.

Keep container closed when not in use

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| United States:<br>Chemical Name | CAS No.  | IDLH               | ACGIH STEL | ACGIH TLV-TWA   | OSHA Exposure<br>Limit                       |
|---------------------------------|----------|--------------------|------------|-----------------|--|
| Dichloromethane                 | 75-09-2  | 2300 ppm<br>IDLH   | None Known | 50 ppm TWA      | 25 ppm TWA; 125<br>ppm STEL (15 min.<br>TWA) |
| indeno (1,2,3-c,d)<br>pyrene    | 193-39-5 | Not<br>established | None Known | Not established | No data available                            |

**Personal Protection:** 

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required

when handling or using this product to avoid overexposure.

Respiratory Protection: Respiratory protection may be required to avoid overexposure when handling this

product. General or local exhaust ventilation is the preferred means of protection.

Use a respirator if general room ventilation is not available or sufficient to

eliminate symptoms.

**Eye Protection:** Wear chemically resistant safety glasses with side shields when handling this

product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash

station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other

protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and

water before eating, drinking, and when leaving work.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory

disease including asthma and bronchitis

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color: Colorless Odor: Strong

Physical State:

pH:

Vapor Pressure:

Vapor Density:

Boiling Point (°C):

Melting Point (°C):

No data available

2.93 (air = 1)

530 °C

Melting Point (°C):

-96.7 °C

Flash Point (°F):

Upper Flammable/Explosive Limit, % in air:
Lower Flammable/Explosive Limit, % in air:
Autoignition Temperature (°C):

Decomposition Temperature (°C):

No data available
556 deg C
No data available

**Specific Gravity:** 1.3254 - 1.3258 g/cm3 at 20 °C

**Evaporation Rate:**No data available

Odor Threshold: ND

Solubility: Moderate; 50-99% Partition Coefficient: n-octanol in water: No data available

VOC % by weight: 99.9

Molecular Weight: No data available

### 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid:

Materials to Avoid / Chemical Incompatiability:

Hazardous Decomposition Products:

None known.Contamination High temperatures
Strong oxidizing agents Caustics (bases)
Carbon dioxide Carbon monoxide

### 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation Absorption Ingestion Skin contact Eye

contact

Target Organs Potentially Affected By Exposure: Skin, Cardiovascular System, Eyes, Liver

Chemical Interactions That Change Toxicity: None Known

### Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea

and headache.

Inhalation Toxicity: Harmful! Can cause systemic damage (see "Target Organs)Inhalation may

cause severe central nervous system depression (including unconsciousness).

**Skin Contact:** Contact causes severe skin irritation and possible burns.

**Skin Absorption:** Harmful if absorbed through the skin. May cause severe irritation and systemic

damage.

**Eye Contact:** Contact with the eyes may cause moderate to severe eye injury. Eye contact

may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.

Ingestion Irritation: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort,

nausea, vomiting and diarrhea.

**Ingestion Toxicity:** Harmful if swallowed. May cause systemic poisoning.

### Long-Term (Chronic) Health Effects:

**Carcinogenicity:** Contains a probable or known human carcinogen.

Reproductive and Developmental Toxicity: No data available to indicate product or any components

present at greater than 0.1% may cause birth defects.

Inhalation:

Upon prolonged and/or repeated exposure, can cause

Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue,

nausea and headache.Harmful! Can cause systemic damage upon prolonged and/or repeated exposure (see

"Target Organs)

Skin Absorption: Upon prolonged or repeated exposure, harmful if

absorbed through the skin. May cause severe irritation

and systemic damage

**Component Toxicological Data:** 

NIOSH:

Chemical Name CAS No. LD50/LC50

Methane, dichloro- 75-09-2 Inhalation LC50 Rat 53 mg/L 6 h

**Component Carcinogenic Data:** 

OSHA:

Chemical Name CAS No. Indeno[1,2,3-cd]pyrene 193-39-5

Indeno[1,2,3-cd]pyrene 193-39-5 Present
Methylene chloride 75-09-2 25 ppm TWA (8 hr.); 125 ppm STEL (15 min.);

12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910

Specifically Regulate

ACGIH:

Chemical Name CAS No.

Dichloromethane 75-09-2 A3 - Confirmed Animal Carcinogen with

Unknown Relevance to Humans

NIOSH:

Chemical Name CAS No.

Methylene chloride 75-09-2 potential occupational carcinogen

NTP:

Chemical Name CAS No.

No data available

IARC:

Chemical NameCAS No.Group No.Monograph 110 [in preparation];75-09-2Group 2A

Monograph 71 [1999]

Monograph 92 [2010]; 193-39-5 Group 2B

Supplement 7 [1987]; Monograph

32 [1983]

12. ECOLOGICAL INFORMATION

Overview: Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data

Ecological Toxicity Data: No data available

13. DISPOSAL CONSIDERATIONS

Waste Description of Spent Product: Spent or discarded material is a hazardous waste. Mixing

spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous

waste determination on mixtures.

Disposal Methods: Incinerate spent or discarded material a permitted

hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial

#### 14. TRANSPORTATION INFORMATION

**United States:** 

**DOT Proper Shipping Name:**Dichloromethane

UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Dichloromethane

UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

| Chemical Name     | CAS# | Marine Pollutant | Severe Marine<br>Pollutant |
|-------------------|------|------------------|----------------------------|
| No data available |      |                  |                            |

#### 15. REGULATORY INFORMATION

| United States:<br>Chemical Name | CAS#     | CERCLA | SARA 313 | SARA EHS<br>313 | TSCA |
|---------------------------------|----------|--------|----------|-----------------|------|
| Dichloromethane                 | 75-09-2  | Χ      | Χ        | -               | X    |
| indeno (1,2,3-c,d)<br>pyrene    | 193-39-5 | X      | Х        | -               | X    |

The following chemicals are listed on CA Prop 65:

| Chemical Name                        | CAS#     | Regulation     |
|--------------------------------------|----------|----------------|
| Indeno[1,2,3-cd]pyrene               | 193-39-5 | Prop 65 Cancer |
| Dichloromethane                      | 75-09-2  | Prop 65 Cancer |
| Dichloromethane (Methylene chloride) |          |                |

State Right To Know Listing:

| ************************************** |          |            |               |              |            |
|--|----------|------------|---------------|--------------|------------|
| Chemical Name                          | CAS#     | New Jersey | Massachusetts | Pennsylvania | California |
| Dichloromethane                        | 75-09-2  | X          | Х             | Χ            | X          |
| indeno (1,2,3-c,d)                     | 193-39-5 | Х          | Х             | Х            | X          |
| pyrene                                 |          |            |               |              |            |

#### 16. OTHER INFORMATION

Prior Version Date: 03/22/18

Other Information: Any changes to the SDS compared to previous versions are marked by a vertical

line in front of the concerned paragraph.

References: No data available

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and accepted at your risk.



### Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 12/15/2014 Revision date: 12/15/2014 Version: 1.1

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
CAS No : 7439-92-1
Formula : Pb

Synonyms : C.I. 77575, in massive state / elemental lead, in massive state / glover, in massive state

BIG no : 10073

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Solder

Battery: component Construction Electrodes

### 1.3. Details of the supplier of the safety data sheet

GSC International, Inc. 1747 N. Deffer Drive Nixa.

MO 65714

United States of America

Tel: 417-374-7431 Fax: 417-374-7442

Email: info@gscinternationalinc.com

#### 1.4. Emergency telephone number

| Country                  | Organization/Company                           | Address  | Emergency number  |
|--------------------------|--|--|---|
| MEXICO                   | Servicio de Informacion Toxicologica Sintox    | Tintoreto #32 Edif. a Desp. Col.<br>Nochebuena Mixcoac<br>México, D.F. | 1 800 009 2800<br>+52 55 5611 2634 /+52 55<br>5598 9095 |
| UNITED STATES OF AMERICA | American Association of Poison Control Centers |  | 1-800-222-1222  |

### **SECTION 2: Hazards identification**

#### 2.1. Classification of the substance or mixture

#### **Classification (GHS-US)**

Acute Tox. 4 (Oral) H302
Acute Tox. 4 (Inhalation) H332
Carc. 1B H350
Repr. 1A H360
STOT RE 2 H373
Aquatic Acute 1 H400
Aquatic Chronic 1 H410
Full text of H-phrases: see section 16

#### 2.2. Label elements

### **GHS-US** labeling

Hazard pictograms (GHS-US)



GHS07



GHS08



GHS09

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H302+H332 - Harmful if swallowed or if inhaled

H350 - May cause cancer

H360 - May damage fertility or the unborn child

H373 - May cause damage to organs through prolonged or repeated exposure

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### Safety Data Sheet

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H400 - Very toxic to aquatic life

H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) : 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

P264 - Wash hands thoroughly after handling

P270 - Do not eat, drink or smoke when using this product

P273 - Avoid release to the environment

P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing

P308+P313 - If exposed or concerned: Get medical advice/attention

P314 - Get medical advice/attention if you feel unwell

P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous

waste

#### 2.3. Other hazards

No additional information available

#### 2.4. Unknown acute toxicity (GHS-US)

Not applicable

#### **SECTION 3: Composition/information on ingredients**

#### 3.1. Substance

| Name                       | Product identifier | %      | Classification (GHS-US)   |
|----------------------------|--------------------|--------|---|
| Lead<br>(Main constituent) | (CAS No) 7439-92-1 | > 99,9 | Acute Tox. 4 (Oral), H302<br>Acute Tox. 4 (Inhalation), H332<br>Carc. 1B, H350<br>Repr. 1A, H360<br>STOT RE 2, H373<br>Aquatic Acute 1, H400<br>Aquatic Chronic 1, H410 |

Full text of H-phrases: see section 16

#### 3.2. Mixture

Not applicable

#### 4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice. IF exposed or concerned: Get medical advice/attention.

Call a poison center/doctor/physician if you feel unwell.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Not applicable. Call a poison

center/doctor/physician if you feel unwell.

First-aid measures after skin contact : Not applicable. Wash skin with plenty of water.

First-aid measures after eye contact : Not applicable. Rinse eyes with water as a precaution.

First-aid measures after ingestion : Not applicable. Rinse mouth. Call a poison center/doctor/physician if you feel unwell.

#### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : No effects known.

Symptoms/injuries after skin contact : No effects known.

Symptoms/injuries after eye contact : No effects known.

Symptoms/injuries after ingestion : No effects known.

Chronic symptoms : No effects known.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

#### **SECTION 5: Firefighting measures**

#### 5.1. Extinguishing media

Suitable extinguishing media : Adapt extinguishing media to the environment.

Unsuitable extinguishing media : No unsuitable extinguishing media known.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : DIRECT FIRE HAZARD. Non combustible.

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Explosion hazard : DIRECT EXPLOSION HAZARD. No data available on direct explosion hazard. INDIRECT

EXPLOSION HAZARD. No data available on indirect explosion hazard.

Reactivity : On burning: formation of metallic fumes. Oxidizes on exposure to air.

5.3. Advice for firefighters

Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to

heat: have neighborhood close doors and windows.

Firefighting instructions : Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water

moderately and if possible collect or contain it.

Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus. Do not attempt to take action without

suitable protective equipment. Self-contained breathing apparatus. Complete protective

clothing.

#### **SECTION 6: Accidental release measures**

#### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective clothing. See "Material-Handling" to select protective clothing.

Emergency procedures : Mark the danger area. No naked flames.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information

refer to section 8: "Exposure controls/personal protection".

#### 6.2. Environmental precautions

Avoid release to the environment. Prevent soil and water pollution. Prevent spreading in sewers. Notify authorities if product enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

For containment : Not applicable. Collect spillage.

Methods for cleaning up : Recover mechanically the product. Pick-up the material. Take collected spill to

manufacturer/competent authority. Notify authorities if product enters sewers or public waters.

Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 13.

#### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling

: Meet the legal requirements. Do not discharge the waste into the drain. Handle unclean empty containers as full ones. Observe strict hygiene. Measure the concentration in the atmosphere. Carry out operations in the open/under local exhaust/ventilation or with respiratory protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, fume. Use only outdoors or in a well-ventilated area. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Wear personal protective equipment. Floors, walls and other surfaces in the hazard area must be cleaned

regularly.

Hygiene measures : Separate working clothes from town clothes. Launder separately. Do not eat, drink or smoke

when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Does not require any specific or particular technical measures. Comply with applicable

regulations.

Storage conditions : Store locked up. Store in a well-ventilated place. Keep cool.

Incompatible materials : Strong acids, strong bases and oxidation agents.

Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources.

Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. Strong acids. Strong bases.

Storage area : Meet the legal requirements.

Special rules on packaging : SPECIAL REQUIREMENTS: closing. correctly labeled. meet the legal requirements. Secure

fragile packaging in solid containers.

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#### 7.3. Specific end use(s)

No additional information available

### SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| Lead (7439-92-1)    | ead (7439-92-1)   |                  |  |
|---------------------|-------------------|------------------|--|
| ACGIH               | ACGIH TWA (mg/m³) | 0,05 mg/m³       |  |
| ACGIH               | Remark (ACGIH)    | CNS & PNS impair |  |
| OSHA Not applicable |                   |                  |  |

#### 8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Ensure good ventilation of the work

station.

Personal protective equipment : Protective goggles. Gloves.





Materials for protective clothing : GIVE EXCELLENT RESISTANCE: No data available. GIVE GOOD RESISTANCE: butyl

rubber. PVC. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: No

data available.

Hand protection : protective gloves. Eye protection : Safety glasses.

Skin and body protection : Not required for normal conditions of use.

Respiratory protection : Wear respiratory protection.

Environmental exposure controls : Avoid release to the environment.

#### **SECTION 9: Physical and chemical properties**

### 9.1. Information on basic physical and chemical properties

Physical state : Solid
Appearance : Metal.
Molecular mass : 207,20 g/mol
Color : White to blue-grey

Odor : Odorless

Odor threshold : No data available pH : No data available Relative evaporation rate (butyl acetate=1) : No data available

Melting point : 327 °C

Freezing point : No data available

Boiling point : 1740 °C

Flash point : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Flammability (solid, gas) : No data available

Vapor pressure : < 0,1 hPa

Relative vapor density at 20 °C : No data available

Relative density : 11,3

Specific gravity / density : 11340 kg/m³

Solubility : insoluble in water. Substance sinks in water. Soluble in nitric acid. Insoluble in organic solvents.

Water: < 0,1 g/100ml

Log Pow : 0,73 (Estimated value)
Log Kow : No data available

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### Safety Data Sheet

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Viscosity, kinematic : Not applicable
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidizing properties : No data available
Explosive limits : No data available

9.2. Other information

VOC content : Not applicable (inorganic)

### **SECTION 10: Stability and reactivity**

#### 10.1. Reactivity

On burning: formation of metallic fumes. Oxidizes on exposure to air.

#### 10.2. Chemical stability

Unstable on exposure to air.

#### 10.3. Possibility of hazardous reactions

No additional information available

#### 10.4. Conditions to avoid

No additional information available

#### 10.5. Incompatible materials

Acids. Bases.

### 10.6. Hazardous decomposition products

Thermal decomposition generates: fume.

### **SECTION 11: Toxicological information**

### 11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation: Harmful if inhaled.

| Lead ( \f )7439-92-1   |  |
|------------------------|--|
| LD50 oral rat          | > 2000 mg/kg body weight (Rat; Weight of evidence)   |
| LD50 dermal rat        | > 2000 mg/kg body weight (Rat; Experimental value; OECD 402: Acute Dermal Toxicity)  |
| ATE US (oral)          | 500,000 mg/kg body weight  |
| ATE US (gases)         | 4500,000 ppmV/4h   |
| ATE US (vapors)        | 11,000 mg/l/4h   |
| ATE US (dust, mist)    | 1,500 mg/l/4h  |
| Additional information | Lead massive metal is not considered to be acutely toxic. It is not easily inhaled or ingested, and if it is accidentally ingested normally passes through the gastrointestinal system without significant absorption into the body. Lead is not easily absorbed through the skin. |

Skin corrosion/irritation : Not classified

(Based on available data, the classification criteria are not met)

Serious eye damage/irritation : Not classified

(Based on available data, the classification criteria are not met)

Respiratory or skin sensitization : Not classified

(Based on available data, the classification criteria are not met)

Germ cell mutagenicity : Not classified

(Based on available data, the classification criteria are not met)

Carcinogenicity : May cause cancer.

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| Lead (7439-92-1)                         |   |
|--|---|
| Additional information                   | There is some evidence that inorganic lead compounds may have a carcinogenic effect, and they have been classified by IARC as probably carcinogenic to humans. However, it is considered that this classification does not apply to lead in articles, given the very low bioavailability of metallic lead. Carcinogenicity studies of lead metal powder have been negative. Epidemiology studies of workers exposed to inorganic lead compounds have found a limited association with stomach cancer. IARC has concluded that lead metal is possibly carcinogenic to humans (Group aB). |
| IARC group                               | 2B - Possibly carcinogenic to humans  |
| National Toxicology Program (NTP) Status | 3 - Reasonably anticipated to be Human Carcinogen   |

Reproductive toxicity : May damage fertility or the unborn child.

Specific target organ toxicity (single exposure) : Not classified

(Based on available data, the classification criteria are not met)

Specific target organ toxicity (repeated

exposure)

: May cause damage to organs through prolonged or repeated exposure.

| Lead (7439-92-1)       |   |
|------------------------|---|
| Additional information | Lead is a cumulative poison and may be absorbed into the body through ingestion or inhalation. Although inhalation and ingestion of lead in massive form are unlikely, poor hygiene practises may result in hand to mouth transfer which maybe significant over a prolonged period of time. Inorganic lead compounds have been documented in observational human studies to produce toxicity in multiple organ systems and body function including the haemotopoetic (blood) system, kidney function, reproductive function and the central nervous system. |
| Aspiration hazard      | : Not classified  |

(Based on available data, the classification criteria are not met)

Symptoms/injuries after inhalation : No effects known. Symptoms/injuries after skin contact : No effects known. Symptoms/injuries after eye contact : No effects known. Symptoms/injuries after ingestion : No effects known. Chronic symptoms : No effects known.

### **SECTION 12: Ecological information**

| 12.1. | Toxicity |  |
|-------|----------|--|

| Ecology - general | : Dangerous for the environment. Very toxic to aquatic life with long lasting effects.  |
|-------------------|---|
| Ecology - air     | : Not dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of<br>fluorinated greenhouse gases (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.2/II. |
| Ecology - water   | No water pollutant (surface water). Maximum concentration in drinking water: 0.010 mg/l (lead).   |

No water pollutant (surface water). Maximum concentration in drinking water: 0.010 mg/l (lead) Ecology - water (Directive 98/83/EC). Highly toxic to aquatic organisms.

| Lead (7439-92-1) |   |
|------------------|---|
| LC50 fish 1      | 2,8 (0,44 - 542) mg/l (96h) Coughlan, D.J., S.P. Gloss, and J. Kubota 1986. Acute and Sub-Chronic Toxicity of Lead to the Early Life Stages of Small mouth Bass (Micropterus dolomieui). Water Air Soil Pollut. 28(3/4):265-275   |
| EC50 Daphnia 1   | 4,46 (0,53 - 5,1) mg/l (48h) Govindarajan, S., C.P. Valsaraj, R. Mohan, V. Hariprasad, and R. Ramasubramanian 1993. Toxicity of Heavy Metals in Aquaculture Organisms: Penaeus indicus, Perna viridis, Artemia salina and Skeletonema costatum. Pollut.Res. 12(3):187-189 |

#### 12.2. Persistence and degradability

| Lead (7439-92-1)              |   |
|-------------------------------|---|
| Persistence and degradability | Biodegradability: Not applicable. No (test)data available on mobility of the substance. |
| ThOD                          | Not applicable (inorganic)  |

#### 12.3. **Bioaccumulative potential**

| Lead (7439-92-1)          |  |  |  |
|---------------------------|--|--|--|
| Log Pow                   | 0,73 (Estimated value)                       |  |  |
| Bioaccumulative potential | Low bioaccumulation potential (Log Kow < 4). |  |  |

#### **Mobility in soil**

No additional information available

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#### 12.5. Other adverse effects

Effect on ozone layer

### **SECTION 13: Disposal considerations**

#### 13.1. Waste treatment methods

Waste disposal recommendations

: Dispose in a safe manner in accordance with local/national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Reuse or recycle following decontamination. Remove to an authorized dump (Class I). Do not discharge into surface water (2000/60/EC, Council decision 2455/2001/EC, O.J. L331 of 15/12/2001).

Additional information : LWCA (the Netherlands): KGA category 05. Hazardous waste according to Directive

2008/98/EC.

#### **SECTION 14: Transport information**

In accordance with DOT

Hazard labels (DOT)

Transport document description : UN3077 Environmentally hazardous substances, solid, n.o.s. Lead(7439-92-1), 9, III

UN-No.(DOT) : UN3077

Proper Shipping Name (DOT) : Environmentally hazardous substances, solid, n.o.s.

Lead(7439-92-1)

Department of Transportation (DOT) Hazard

Classes

: 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

: 9 - Class 9 (Miscellaneous dangerous materials)



DOT Symbols : G - Identifies PSN requiring a technical name

Packing group (DOT) : III - Minor Danger

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DOT Special Provisions (49 CFR 172.102)

- : 8 A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies.
  - 146 This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.
  - 335 Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s," UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leak-proof when used as bulk packaging.

A112 - Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg:

- a. Metal: 11A, 11B, 11N, 21A, 21B and 21N
- b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2
- c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2
- d. Fiberboard: 11G
- e. Wooden: 11C, 11D and 11F (with inner liners)
- f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner). B54 Open-top, sift-proof rail cars are also authorized.
- IB8 Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
- IP3 Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner.

N20 - A 5M1 multi-wall paper bag is authorized if transported in a closed transport vehicle. T1 - 1.5 178.274(d)(2) Normal...... 178.275(d)(2)

TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : 155
DOT Packaging Non Bulk (49 CFR 173.xxx) : 213
DOT Packaging Bulk (49 CFR 173.xxx) : 240
DOT Quantity Limitations Passenger aircraft/rail : No limit

(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : No limit

CFR 175.75)

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a

passenger vessel.

#### **Additional information**

Other information : No supplementary information available.

#### **ADR**

No additional information available

#### Transport by sea

UN-No. (IMDG) : 3077

Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Class (IMDG) : 9 - Miscellaneous dangerous compounds
Packing group (IMDG) : III - substances presenting low danger

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Air transport

UN-No.(IATA) : 3077

Proper Shipping Name (IATA) : Environmentally hazardous substance, solid, n.o.s.

Class (IATA) : 9 - Miscellaneous Dangerous Goods

Packing group (IATA) : III - Minor Danger

#### **SECTION 15: Regulatory information**

#### 15.1. US Federal regulations

#### Lead (7439-92-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on United States SARA Section 313 Not listed on the United States SARA Section 313

RQ (Reportable quantity, section 304 of EPA's List of Lists) 10 lb

#### 15.2. International regulations

#### **CANADA**

No additional information available

#### **EU-Regulations**

No additional information available

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Repr. 1A H360Df
Acute Tox. 4 (Inhalation) H332
Acute Tox. 4 (Oral) H302
STOT RE 2 H373
Aquatic Acute 1 H400
Aquatic Chronic 1 H410
Full text of H-phrases: see section 16

#### Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Repr.Cat.1; R61 Repr.Cat.3; R62 Xn; R20/22 R33 N; R50/53

Full text of R-phrases: see section 16

### 15.2.2. National regulations

### Lead (7439-92-1)

Listed on IARC (International Agency for Research on Cancer) Listed as carcinogen on NTP (National Toxicology Program)

### 15.3. US State regulations

No additional information available

#### **SECTION 16: Other information**

Revision date : 12/15/2014

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### Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

#### Full text of H-phrases:

| Acute Tox. 4 (Inhalation) | Acute toxicity (inhalation) Category 4                           |
|---------------------------|--|
| Acute Tox. 4 (Oral)       | Acute toxicity (oral) Category 4                                 |
| Aquatic Acute 1           | Hazardous to the aquatic environment - Acute Hazard Category 1   |
| Aquatic Chronic 1         | Hazardous to the aquatic environment - Chronic Hazard Category 1 |
| Carc. 1B                  | Carcinogenicity Category 1B                                      |
| Repr. 1A                  | Reproductive toxicity Category 1A                                |
| STOT RE 2                 | Specific target organ toxicity (repeated exposure) Category 2    |
| H302                      | Harmful if swallowed   |
| H332                      | Harmful if inhaled   |
| H350                      | May cause cancer   |
| H360                      | May damage fertility or the unborn child                         |
| H373                      | May cause damage to organs through prolonged or repeated         |
|                           | exposure   |
| H400                      | Very toxic to aquatic life                                       |
| H410                      | Very toxic to aquatic life with long lasting effects             |
|                           |  |

NFPA health hazard : 2 - Intense or continued exposure could cause temporary

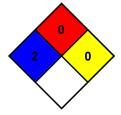
incapacitation or possible residual injury unless prompt

medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions,

and are not reactive with water.



HMIS III Rating

Health : \* Chronic Hazard - Chronic (long-term) health effects may result from repeated overexposure

Flammability : 0 Minimal Hazard Physical : 0 Minimal Hazard

Personal Protection : B

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

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## **SAFETY DATA SHEET**

Creation Date 20-Aug-2014 Revision Date 17-Jan-2018 Revision Number 3

1. Identification

Product Name Mercury (Certified ACS)

Cat No.: M141-1LB; M141-6LB

Synonyms Colloidal mercury; Hydrargyrum; Metallic mercury

Recommended Use Laboratory chemicals.

Uses advised against

Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific 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)

Corrosive to metals

Acute Inhalation Toxicity - Vapors

Reproductive Toxicity

Specific target organ toxicity - (repeated exposure)

Category 1

Category 1

Category 1

Target Organs - Central nervous system (CNS), Kidney.

#### Label Elements

### Signal Word

Danger

### **Hazard Statements**

May be corrosive to metals

Fatal if inhaled

May damage the unborn child

Causes 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

Do not get in eyes, on skin, or on clothing

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

#### 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

Immediately call a POISON CENTER or doctor/physician

#### Skin

Immediately call a POISON CENTER or doctor/physician

IF ON SKIN: Gently wash with plenty of soap and water

Remove/Take off immediately all contaminated clothing

Wash contaminated clothing before reuse

#### 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

WARNING. Reproductive Harm - https://www.p65warnings.ca.gov/.

## 3. Composition/Information on Ingredients

| Component | CAS-No    | Weight % |
|-----------|-----------|----------|
| Mercury   | 7439-97-6 | 100      |

### 4. 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 soap and plenty of water while removing all contaminated

clothes and shoes. Immediate medical attention is required.

**Inhalation** Move to fresh air. If breathing is difficult, give oxygen. 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. Immediate

medical attention is required.

**Ingestion** Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms and

effects

No information available.

**Notes to Physician** Treat symptomatically

### Fire-fighting measures

Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. **Suitable Extinguishing Media** 

**Unsuitable Extinguishing Media** No information available

**Flash Point** No information available Method -No information available

**Autoignition Temperature** 

**Explosion Limits** 

No information available

No data available Upper No data available Lower Sensitivity to Mechanical Impact No information available Sensitivity to Static Discharge No information available

### Specific Hazards Arising from the Chemical

Very toxic. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Keep product and empty container away from heat and sources of ignition.

### **Hazardous Combustion Products**

Mercury oxide Highly toxic fumes

### **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

Up

| Health | Flammability | Instability | Physical hazards |
|--------|--------------|-------------|------------------|
| 4      | 0            | 0           | N/A              |

### 6. Accidental release measures

**Personal Precautions** 

Wear self-contained breathing apparatus and protective suit. Evacuate personnel to safe areas. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Should not be released into the environment. See Section 12 for additional ecological information.

**Environmental Precautions** 

Methods for Containment and Clean Wear self-contained breathing apparatus and protective suit. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

### 7. Handling and storage

Use only under a chemical fume hood. Wear personal protective equipment. Do not get in Handling

eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Do not ingest.

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Storage

#### 8. Exposure controls / personal protection

### **Exposure Guidelines**

| Component | ACGIH TLV                    | OSHA PEL                                 | NIOSH IDLH                     | Mexico OEL (TWA)            |
|-----------|------------------------------|--|--------------------------------|-----------------------------|
| Mercury   | TWA: 0.025 mg/m <sup>3</sup> | (Vacated) TWA: 0.05 mg/m <sup>3</sup>    | IDLH: 10 mg/m <sup>3</sup>     | TWA: 0.05 mg/m <sup>3</sup> |
|           | Skin                         | Ceiling: 0.1 mg/m <sup>3</sup>           | TWA: 0.05 mg/m <sup>3</sup>    |                             |
|           |                              | (Vacated) STEL: 0.03 mg/m <sup>3</sup>   | Ceiling: 0.1 mg/m <sup>3</sup> |                             |
|           |                              | Skin                                     |                                |                             |
|           |                              | (Vacated) Ceiling: 0.1 mg/m <sup>3</sup> |                                |                             |

Mercury (Certified ACS)

Revision Date 17-Jan-2018

#### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined

areas. 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.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

### 9. Physical and chemical properties

Physical StateLiquidAppearanceSilverOdorOdorless

Odor ThresholdNo information availablepHNo information availableMelting Point/Range-38.87 °C / -38 °FBoiling Point/Range356.72 °C / 674.1 °FFlash PointNo information availableEvaporation RateNo information available

Flammability (solid,gas)

No information available

Flammability or explosive limits

UpperNo data availableLowerNo data availableVapor Pressure0.002 mmHg @ 25 °C

Vapor Density 7.0

Specific Gravity
13.59 (H2O=1)
Solubility
Insoluble in water
Partition coefficient: n-octanol/water
No data available

Autoignition TemperatureNo information availableDecomposition TemperatureNo information availableViscosityNo information available

Molecular Formula Hg
Molecular Weight 200.59

### 10. Stability and reactivity

Reactive Hazard None known, based on information available

**Stability** Stable under normal conditions.

**Conditions to Avoid** Incompatible products. Excess heat.

Incompatible Materials Strong oxidizing agents, Ammonia, Metals, Halogens

Mercury (Certified ACS)

Revision Date 17-Jan-2018

Hazardous Decomposition Products Mercury oxide, Highly toxic fumes

**Hazardous Polymerization** Hazardous polymerization does not occur.

**Hazardous Reactions** None under normal processing.

### Toxicological information

**Acute Toxicity** 

**Product Information** 

No acute toxicity information is available for this product

**Component Information Toxicologically Synergistic** 

No information available

**Products** 

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     |
|-----------|-----------|------------|------------|------------|------------|------------|
| Mercury   | 7439-97-6 | Not listed |

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

**Developmental Effects** May cause harm to the unborn child.

**Teratogenicity** No information available.

STOT - single exposure

None known

STOT - repeated exposure Central nervous system (CNS) Kidney

**Aspiration hazard** No information available

Symptoms / effects, both acute and No information available

delayed

**Endocrine Disruptor Information** No information available

The toxicological properties have not been fully investigated. Other Adverse Effects

### 12. Ecological information

#### **Ecotoxicity**

This product contains the following substance(s) which are hazardous for the environment.

| Component | Freshwater Algae | Freshwater Fish    | Microtox   | Water Flea            |
|-----------|------------------|--------------------|------------|-----------------------|
| Mercury   | Not listed       | 0.9 mg/L LC50 96h  | Not listed | EC50: = 5.0 μg/L, 96h |
| •         |                  | 0.18 mg/L LC50 96h |            | (water flea)          |
|           |                  | 0.16 mg/L LC50 96h |            | , ,                   |
|           |                  | 0.5 mg/L LC50 96h  |            |                       |

Persistence and Degradability No information available

**Bioaccumulation/ Accumulation** No information available.

No information available. Mobility

### 13. Disposal considerations

Revision Date 17-Jan-2018

### **Mercury (Certified ACS)**

#### **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 |
|---------------------|------------------------|------------------------|
| Mercury - 7439-97-6 | U151                   | -                      |

### 14. Transport information

DOT

UN-No UN2809 Proper Shipping Name MERCURY

Hazard Class 8
Subsidiary Hazard Class 6.1
Packing Group III

<u>TDG</u>

UN-No UN2809
Proper Shipping Name MERCURY

Hazard Class 8
Subsidiary Hazard Class 6.1
Packing Group III

IATA

UN-No UN2809
Proper Shipping Name MERCURY

Hazard Class 8
Subsidiary Hazard Class 6.1
Packing Group III

IMDG/IMO

UN-No UN2809
Proper Shipping Name MERCURY

Hazard Class 8
Subsidiary Hazard Class 6.1
Packing Group III

### 15. Regulatory information

### **International Inventories**

| Component | TSCA | DSL | NDSL | EINECS    | ELINCS | NLP | PICCS | ENCS | AICS | IECSC | KECL |
|-----------|------|-----|------|-----------|--------|-----|-------|------|------|-------|------|
| Mercury   | Х    | Χ   | -    | 231-106-7 | -      |     | Χ     | -    | Χ    | Χ     | Χ    |

### Legend:

- X Listed
- E Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- N Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- P Indicates a commenced PMN substance
- R Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- S Indicates a substance that is identified in a proposed or final Significant New Use Rule
- T Indicates a substance that is the subject of a Section 4 test rule under TSCA.
- XU Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
- Y1 Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
- Y2 Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### U.S. Federal Regulations

### **TSCA 12(b)**

| Component | TSCA 12(b) |
|-----------|------------|
| Mercury   | Section 5  |

#### **SARA 313**

| Component | CAS-No    | Weight % | SARA 313 - Threshold<br>Values % |
|-----------|-----------|----------|----------------------------------|
| Mercury   | 7439-97-6 | 100      | 1.0                              |

SARA 311/312 Hazard Categories See section 2 for more information

**CWA (Clean Water Act)** 

| Component | CWA - Hazardous<br>Substances | CWA - Reportable<br>Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |
|-----------|-------------------------------|--------------------------------|------------------------|---------------------------|
| Mercury   | -                             | -                              | X                      | X                         |

#### Clean Air Act

| Component | HAPS Data | Class 1 Ozone Depletors | Class 2 Ozone Depletors |
|-----------|-----------|-------------------------|-------------------------|
| Mercury   | 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 |
|-----------|--------------------------|----------------|
| Mercury   | 1 lb                     | -              |

**California Proposition 65** 

This product contains the following proposition 65 chemicals

| Compone | ent | CAS-No    | California Prop. 65 | Prop 65 NSRL | Category      |
|---------|-----|-----------|---------------------|--------------|---------------|
| Mercury | /   | 7439-97-6 | Developmental       | -            | Developmental |

### U.S. State Right-to-Know

Regulations

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|-----------|---------------|------------|--------------|----------|--------------|
| Mercury   | X             | X          | Χ            | 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

|   | 16. Other information |
|---|-----------------------|
| D | Description Affects   |

Prepared By Regulatory Affairs

Thermo Fisher Scientific

Email: EMSDS.RA@thermofisher.com

 Creation Date
 20-Aug-2014

 Revision Date
 17-Jan-2018

 Print Date
 17-Jan-2018

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).

Mercury (Certified ACS)

Revision Date 17-Jan-2018

#### **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** 

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413
Revision Date: 30-11-2020
This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier: Tetrachloroethene Standard

Stock Number: 30413

Other means of identification:

Synonyms: None Known
REACH Registration No.: None Known
Molecular formula: CH3OH

1.2 Relevant identified uses of the substance or mixture and uses advised against:

**Relevant identified uses:** For Laboratory use only

**Uses advised against:** Uses other than recommended use.

1.3 Details of the Supplier of the Safety

**Data Sheet:** 

Manufacturer Supplier

Restek Corporation Thames Restek UK LTD

110 Benner Circle Units 8-16, Ministry Wharf

Bellefonte, Pa. 16823 Wycombe Road, Saunderton

USA Buckinghamshire

00 1 814-353-1300 United Kingdom HP14 4HW

00 1 814-353-1309 01494 563377

sds@restek.com sales@thamesrestek.co.uk

**1.4 Emergency telephone number:** 00 1 800-424-9300 0870-8200418

(CHEMTREC within the US) (CHEMTREC within the UK)

00 1 703-741-5970 +1 703-741-5970

(Outside USA) (CHEMTREC International)

Poison Centre contact information: National Poisons Information Service (NPIS)

Email: director.birmingham.unit@npis.org

Website: http://www.npis.org/

### **SECTION 2: Hazards identification**

### 2.1 Classification of the substance or mixture:

Classification according to Regulation (EC)

No 1272/2008 [CLP]:

Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1 Flammable Liquid Category 2

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413
Revision Date: 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

Acute Toxicity - Dermal Category 3
Acute Toxicity - Oral Category 3

2.2 Label elements:

Labelling according to Regulation (EC) No 1272/2008 [CLP]:

Hazard pictograms:







Signal Word: Danger

Hazard Statements: H225 - Highly flammable liquid and vapour

H301+H311 - Toxic if swallowed or in contact with skin

H370 - Causes damage to organs

**Precautionary Statements:** P210 - Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking.

P233 - Keep container tightly closed.

P260 - Do not breathe dust/fume/gas/mist/vapours/spray.

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.

Supplemental Hazard information (EU): None Known

**2.3 Other hazards:** This substance does not meet the PBT or vPvB criteria of REACH, Annex XIII

**SECTION 3: Composition/information on ingredients** 

3.1 Substances:

Not applicable

3.2 Mixtures:

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413
Revision Date: 30-11-2020
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### **Tetrachloroethene Standard**

| Chemical Name       | %    | CAS#     | EC No.<br>REACH<br>Registration No. | Classification (EC)<br>No 1272/2008   | M Factor             | SCL                                       | Acute<br>Toxicity<br>Estimates |
|---------------------|------|----------|-------------------------------------|---|----------------------|---|--------------------------------|
| Tetrachloroethylene | 0.2  | 127-18-4 | 204-825-9<br>None Known             | Aquatic Chronic 2;<br>H411<br>Carc. 2; H351   | No data<br>available | No data<br>available                      | Not<br>determined              |
| Methanol            | 99.8 | 67-56-1  | 200-659-6<br>None Known             | Acute Tox. 3 (Dermal); H311 Acute Tox. 3 (Inh Dust/Mist); H331 Acute Tox. 3 (Oral); H301 Flam. Liq. 2; H225 STOT SE 1; H370 | No data<br>available | STOT SE 2:<br>3%<10%<br>STOT SE 1:<br>10% | Not<br>determined              |

For full text of H-statements see Section 16.

| SECTION 4: | First aid | measures |
|------------|-----------|----------|
|            |           |          |

**Skin Contact:** 

4.1 Description of first aid measures:

| Inhalation:  | Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately  |
|--------------|--|
| Eye contact: | Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention and monitor the eye daily as advised by your physician. Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention. |

Wash with soap and water. Remove contaminated clothing and launder. Get

medical attention if irritation develops or persists.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two

glasses of water or milk to dilute. Provide medical care provider with this

SDS.

**Self protection of the first aider:** No data available

### Prepared in accordance with Commission Regulation (EU) 2015/830



**Stock Number:** 30413 **Revision Date:** 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

4.2 Most important symptoms and effects, both acute and delayed:

Coma and death

None Known

4.3 Indication of any immediate medical attention and special treatment needed:

IF exposed or concerned: Call a POISON CENTER/doctor. Call a POISON

CENTER/doctor if you feel unwell.

### **SECTION 5: Firefighting measures**

5.1 Extinguishing media:

**Suitable extinguishing media:** Not combustible. Use extinguishing media appropriate for surrounding fire.

Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used extinguish a fire if swept across the base of the flames. Water can absorb heat and keep

exposed material from being damaged by fire.

Unsuitable extinguishing media:

5.2 Special hazards arising from the

substance or mixture:

**5.3** Advice for firefighters:

Vapors may be ignited by sparks, flames or other sources of ignition if material is above the flash point giving rise to a fire (Class B). Vapors are

**Hazardous Combustion Products:** 

nazardous combustion Products.

heavier than air and may travel to a source of ignition and flash back.

Carbon dioxide, Carbon monoxide

Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may

be lighter than water and burn while floating on the surface.

#### **SECTION 6: Accidental release measures**

**6.1** Personal precautions, protective equipment and emergency procedures:

**Non-emergency personnel:** Non-emergency personnel should be kept clear of the area

**Emergency responders:** Exposure to the spilled material may be severely irritating or toxic. Follow

personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area

responding to the spill. Never exceed any occupational exposure limits.

**6.2 Environmental precautions:** 

No data available

6.3 Methods and material for containment and cleaning up:

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413 Revision Date: 30-11-2020

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2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

Small spills: Refer to information provided for large spills

Large spills: Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a

sealed container pending a waste disposal evaluation.

**6.4 Reference to other sections:** Refer to section 13 for disposal information

### **SECTION 7: Handling and storage**

**7.1 Precautions for safe handling:** Toxic or severely irritating material. Avoid contacting and avoid breathing

the material. Use only in a well ventilated area. Use spark-proof tools and

explosion-proof equipment

7.2 Conditions for safe storage, including

any incompatibilities:

**Conditions for safe storage:** Store in a cool dry ventilated location. Isolate from incompatible materials

and conditions. Keep container(s) closed. Keep away from sources of ignition

Materials to Avoid/Chemical

Incompatibility:

Strong oxidizing agents

**7.3 Specific end use(s):** For Laboratory use only

### **SECTION 8: Exposure controls/personal protection**

#### 8.1 Control parameters:

#### **Occupational Exposure limit values:**

|                     | United Kingdom -     | United Kingdom -      | United Kingdom -      |
|---------------------|----------------------|-----------------------|-----------------------|
| Chemical Name       | Workplace Exposure   | Workplace Exposure    | Biological Monitoring |
|                     | Limits (WELs) - TWAs | Limits (WELs) - STELs | Guidance Values       |
| Methanol            | 200 ppm TWA; 266     | 250 ppm STEL; 333     | No data available     |
|                     | mg/m3 TWA            | mg/m3 STEL            |                       |
| Tetrachloroethylene | 50 ppm TWA; 345      | 100 ppm STEL; 689     | No data available     |
| ·                   | mg/m3 TWA            | mg/m3 STEL            |                       |

**DNEL:** None Known **PNEC:** None Known

8.2 Exposure controls:

**Appropriate engineering controls:** No exposure limits exist for the constituents of this product. Use local

exhaust ventilation or other engineering controls to minimize exposures and

maintain operator comfort.

### Prepared in accordance with Commission Regulation (EU) 2015/830



**Stock Number:** 30413 **Revision Date:** 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

Individual protection measures, such as personal protective equipment:

**Eye and face protection:** Wear chemically resistant safety glasses with side shields when handling this

product. Do not wear contact lenses.

**Skin Protection:** 

Hand protection: No information available

**Other skin protection:** Avoid skin contact by wearing chemically resistant gloves, an apron and

other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work. Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and

when leaving work

**Respiratory Protection:** If an exposure limit is exceeded or if an operator is experiencing symptoms

of inhalation overexposure as explained in Section 3, provide respiratory protection. Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is

not available or sufficient to eliminate symptoms.

**Respirator Type(s):** None required where adequate ventilation is provided. If airborne

concentrations are above the applicable exposure limits, use NIOSH/MSHA

approved respiratory protection.

Thermal Hazards: Not applicable

**Environmental exposure controls:**No data available

### **SECTION 9: Physical and chemical properties**

9.1 Information on basic physical and chemical properties:

Appearance: Liquid

Colour: No data available

Odour: Mild

Odour threshold:

PH:

No data available

Not applicable

**Melting Point/Freezing Point (°C):** 

Melting point (°C): No data available

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413 Revision Date: 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

Freezing point (°C): No data available

Initial boiling point and boiling range (°C): 65 Flash point (°C): 11

Evaporation Rate (water = 1): No data available Flammability (solid, gas): No data available

Upper/lower flammability or explosive

limits:

Upper flammable or explosive limit, % 36

in air:

Lower flammable or explosive limit, %

in air:

Vapour pressure: No data available

Vapor Density (Air=1): 1.1

Relative density (water = 1):  $0.791 - 0.792 \text{ g/cm}3 \text{ at } 20 ^{\circ}\text{C}$ 

**Solubility(ies):** Moderate; 50-99% **Partition coefficient: n-octanol/water:** No data available

Auto-ignition temperature (°C): 464

Decomposition temperature (°C):No data availableViscosity:No data availableExplosive properties:No data availableOxidizing properties:No data available

9.2 Other information:

Volatile Organic Chemicals: 100

Bulk density: 6.684

### **SECTION 10: Stability and reactivity**

**10.1 Reactivity:** Not expected to be reactive

**10.2 Chemical stability:** Stable under normal conditions.

**10.3 Possibility of hazardous reactions:** None expected under standard conditions of storage

10.4 Conditions to avoid: No data available10.5 Incompatible materials: Strong oxidizing agents

**10.6 Hazardous decomposition products:** Carbon dioxide, Carbon monoxide

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413
Revision Date: 30-11-2020
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2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

### **SECTION 11: Toxicological information**

### 11.1 Information on toxicological effects:

### Acute toxicity:

| Chemical Name       | ORAL LD50 (rat)    | DERMAL LD50 (rabbit) | INHALATION LC50 (rat) |
|---------------------|--------------------|----------------------|-----------------------|
| Methanol            | No data available  | No data available    | INHALATION LC50-8H    |
| Methanol            |                    | No data available    | Rat 22500 ppm         |
| Totrachloroothylono | ORAL LD50 Rat 2629 | No data available    | INHALATION LC50-4H    |
| Tetrachloroethylene | mg/kg              | NO data available    | VAPOR Rat 27.8 MG/L   |

Classification has been based on toxicological information of the components in Section 3.

#### Skin corrosion/irritation:

Based on available data, the classification criteria are not met.

### Serious eye damage/irritation:

Based on available data, the classification criteria are not met.

#### Respiratory or skin sensitisation:

Based on available data, the classification criteria are not met.

### Germ cell mutagenicity:

Based on available data, the classification criteria are not met.

#### Carcinogenicity:

Based on available data, the classification criteria are not met.

### Reproductive toxicity:

Based on available data, the classification criteria are not met.

### STOT-single exposure:

Classification has been based on toxicological information of the components in Section 3.

### STOT-repeated exposure:

Based on available data, the classification criteria are not met.

#### **Aspiration hazard:**

Based on available data, the classification criteria are not met.

### **SECTION 12: Ecological information**

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413 Revision Date: 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

**12.1 Toxicity:** Moderate ecological hazard. This product may be dangerous to plants

and/or wildlife.

### **Ecological Toxicity Data:**

| Chemical Name     | CAS# | Aquatic EC50<br>Crustacea | Aquatic ERC50<br>Algae | Aquatic LC50 Fish |
|-------------------|------|---------------------------|------------------------|-------------------|
| No data available |      |                           |                        |                   |

12.2 Persistence and degradability:Biodegrades slowly.12.3 Bioaccumulative potential:No data available12.4 Mobility in soil:No data available12.5 Results of PBT and vPvB assessment:No data available12.6 Other adverse effects:None Known12.7 Additional information:No data available

### **SECTION 13: Disposal considerations**

13.1 Waste treatment methods:

**Disposal methods:** Spent or discarded material is a hazardous waste.

Dispose of by incineration following Federal, State, Local, or Provincial

regulations.

Waste codes / waste designations

according to LoW:

No data available

### **SECTION 14: Transport information**

International carriage of dangerous goods by road (ADR), rail or inland waterways:

14.1 UN number: UN123014.2 UN proper shipping name: Methanol

**14.3** Transport hazard class(es): 3(6.1)

14.4 Packing group:

International carriage of dangerous goods by air (IATA):

**14.1 UN number:** UN1230

**14.2 UN proper shipping name:** Methanol

**14.3** Transport hazard class(es): 3(6.1)

## Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413 Revision Date: 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

14.4 Packing group:

14.5 Environmental hazards: No

14.6 Special precautions for user: No data available14.7 Transport in bulk according to Annex No data available

II of MARPOL and the IBC Code:

### **SECTION 15: Regulatory information**

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

| Chemical Name       | EINECS | SVHC |
|---------------------|--------|------|
| Methanol            | Yes    | No   |
| Tetrachloroethylene | Yes    | No   |

**15.2 Chemical Safety Assessment**No Chemical Safety Assessment has been carried out for this

substance/mixture by the supplier.

### **SECTION 16: Other information**

Revision Date: 30-11-2020

**Indication of changes:** Any changes to the SDS compared to previous versions are marked by a

vertical line in front of the concerned paragraph.

**Abbreviations and acronyms:** CAS = Chemical Abstract Service

**DNEL= Derivative No Effect Level** 

**EC= European Community** 

**EINECS = European Inventory of Existing Chemical Substances** 

MSHA = Mine Safety Health Administration

NIOSH = National Institute of Occupational Safety & Health

OEL = Occupational Exposure Limit
PBT= Persistent, Bioaccumulative, Toxic
PNEC= Predicted No Effect Concentration

SCOEL= Scientific Committee on Occupational Exposure Limits

TLV = Threshold Limit Value TWA= Time Weighted Average

vPvB= Very Persistent, Very Bioaccumulative

Wt.% = Weight Percent

### Prepared in accordance with Commission Regulation (EU) 2015/830



Stock Number: 30413
Revision Date: 30-11-2020
This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

**Key literature references and sources for** No data:

No data available

Hazard phrase(s) referenced in section 3

H351 - Suspected of causing cancer.

H225 - Highly flammable liquid and vapour

H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled

H370 - Causes damage to organs

H411 - Toxic to aquatic life with long lasting effects

**Precautionary Statements:** 

**Prevention:** 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 only non-sparking tools.

P243 - Take precautionary measures against static discharge. P260 - Do not breathe dust/fume/gas/mist/vapours/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.

**Response:** P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER/doctor.

P302+P352 - If on skin: Wash with plenty of water.

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all

contaminated clothing. Rinse skin with water/shower.

P308+P311 - IF exposed or concerned: Call a POISON CENTER/doctor.

P312 - Call a POISON CENTER/doctor if you feel unwell.

P321 - Specific treatment (see Sections 4 to 8 on this SDS and any additional

information on this label).

P330 - Rinse mouth.

P361+P364 - Take off immediately all contaminated clothing and wash it

before reuse.

P370+P378 - In case of fire: Use an appropriate extinguisher (see section 5)

to extinguish.

**Storage:** P233 - Keep container tightly closed.

## Prepared in accordance with Commission Regulation (EU) 2015/830



**Stock Number:** 30413 **Revision Date:** 30-11-2020

This document replaces SDS dated: 31-05-2019

2 Letter ISO country code/language code: UK/EN

### **Tetrachloroethene Standard**

P403+P235 - Store in a well-ventilated place. Keep cool.

P405 - Store locked up.

**Disposal:** P501 - Dispose of contents/container to a suitable disposal site in

accordance with local/national/international regulations.

**Disclaimer of Liability:** 

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## SAFETY DATA SHEET



### Trichloroethylene

## **Section 1. Identification**

**GHS** product identifier

: Trichloroethylene : trichloroethylene

**Chemical name** Other means of

identification

: trichloroethene; Ethene, 1,1,2-trichloro-; Ethene, trichloro-; Trichlorethylene; Ethylene,

trichloro-

**Product use** 

: Synthetic/Analytical chemistry.

**Synonym** 

: trichloroethene; Ethene, 1,1,2-trichloro-; Ethene, trichloro-; Trichlorethylene; Ethylene,

trichloro-

SDS#

: 001206

Supplier's details

: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road

Suite 100

Radnor, PA 19087-5283

1-610-687-5253

24-hour telephone

: 1-866-734-3438

### Section 2. Hazards identification

**OSHA/HCS** status

: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A

GERM CELL MUTAGENICITY - Category 2

**CARCINOGENICITY - Category 1** 

AQUATIC HAZARD (LONG-TERM) - Category 3

### **GHS label elements**

**Hazard pictograms** 





Signal word

**Hazard statements** 

: Causes serious eye irritation. Causes skin irritation.

May cause cancer.

Suspected of causing genetic defects.

Harmful to aquatic life with long lasting effects.

### **Precautionary statements**

**General** 

: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

**Prevention** 

: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Wash hands thoroughly after handling.

Response

: IF exposed or concerned: Get medical attention. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. 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 attention.

**Storage** 

: Store locked up.

**Disposal** 

: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Date of issue/Date of revision : 11/21/2016 1/12 Date of previous issue Version: 0.01 : No previous validation

Trichloroethylene

## Section 2. Hazards identification

Hazards not otherwise

: None known.

classified

## Section 3. Composition/information on ingredients

Substance/mixture

: Substance

**Chemical name** 

: trichloroethylene

Other means of identification

: trichloroethene; Ethene, 1,1,2-trichloro-; Ethene, trichloro-; Trichlorethylene; Ethylene,

trichloro-

### **CAS** number/other identifiers

**CAS** number : 79-01-6 **Product code** : 001206

| Ingredient name   | %   | CAS number |
|-------------------|-----|------------|
| trichloroethylene | 100 | 79-01-6    |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

### **Description of necessary first aid measures**

**Eye contact** 

: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation

: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact

: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion

: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

### Potential acute health effects

**Eye contact** : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

: Causes skin irritation. **Skin contact** 

**Frostbite** : Try to warm up the frozen tissues and seek medical attention.

Ingestion : No known significant effects or critical hazards.

Date of issue/Date of revision : 11/21/2016 Version: 0.01 2/12 Date of previous issue : No previous validation

Trichloroethylene

## Section 4. First aid measures

### Over-exposure signs/symptoms

**Eye contact**: Adverse symptoms may include the following:, pain or irritation, watering, redness

Inhalation : No specific data.

**Skin contact**: Adverse symptoms may include the following:, irritation, redness

**Ingestion**: No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed.

The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments** : No specific treatment.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is

suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water

before removing it, or wear gloves.

### See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### **Extinguishing media**

Suitable extinguishing

media

**Unsuitable extinguishing** 

media

: Use an extinguishing agent suitable for the surrounding fire.

: None known.

Specific hazards arising from the chemical

: In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products

: Decomposition products may include the following materials:

carbon dioxide carbon monoxide

halogenated compounds

carbonyl halides

Special protective actions for fire-fighters

: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable

training.

Special protective equipment for fire-fighters

: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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## Section 6. Accidental release measures

### **Environmental precautions**

: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

### Methods and materials for containment and cleaning up

### **Small spill**

: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

### Large spill

: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### **Precautions for safe handling**

#### **Protective measures**

: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

## Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

# Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

**Control parameters** 

**Occupational exposure limits** 

trichloroethylene

ACGIH TLV (United States, 3/2016).

STEL: 25 ppm 15 minutes. TWA: 10 ppm 8 hours.

OSHA PEL 1989 (United States, 3/1989).

STEL: 1080 mg/m³ 15 minutes. STEL: 200 ppm 15 minutes. TWA: 270 mg/m³ 8 hours. TWA: 50 ppm 8 hours.

OSHA PEL Z2 (United States, 2/2013).

AMP: 300 ppm 5 minutes.

CEIL: 200 ppm

TWA: 100 ppm 8 hours.

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## Section 8. Exposure controls/personal protection

# Appropriate engineering controls

# : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

# **Environmental exposure** controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

#### **Individual protection measures**

**Hygiene measures** 

: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** 

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

**Skin protection** 

**Hand protection** 

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** 

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

#### **Appearance**

Physical state : Liquid. [Watery liquid.]

Color : Colorless.

Molecular weight : 131.38 g/mole

Molecular formula : C2-H-Cl3

Boiling/condensation point : 86.7°C (188.1°F)

Melting/freezing point : -84.8°C (-120.6°F)

Critical temperature : Not available.

Odor : Characteristic.
Odor threshold : Not available.
pH : Not available.
Flash point : Not available.
Burning time : Not applicable.
Burning rate : Not applicable.

**Evaporation rate** : 6.39 (butyl acetate = 1)

Flammability (solid, gas) : Not available.

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Trichloroethylene

## Section 9. Physical and chemical properties

Lower and upper explosive

(flammable) limits

: Lower: 8% Upper: 10.5%

Vapor pressure

: 9.9 kPa (74.256033302 mm Hg) [room temperature]

Vapor density

: 4.5 (Air = 1)

Specific Volume (ft 3/lb)

0.6849

Gas Density (lb/ft 3)

1.46

**Relative density** 

: 1.5

Solubility

: Not available.

Solubility in water

: 1.1 g/l

Partition coefficient: n-

2.53

octanol/water

**Auto-ignition temperature Decomposition temperature**: Not available.

: 410°C (770°F)

**SADT** 

: Not available.

**Viscosity** 

: Dynamic (room temperature): 0.58 mPa·s (0.58 cP)

## Section 10. Stability and reactivity

Reactivity

: No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** 

: The product is stable.

**Possibility of hazardous** 

reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** 

: No specific data.

Incompatible materials

: No specific data.

**Hazardous decomposition** 

products

: Under normal conditions of storage and use, hazardous decomposition products should

not be produced.

**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

## **Section 11. Toxicological information**

#### Information on toxicological effects

#### **Acute toxicity**

| Product/ingredient name | Result                | Species | Dose         | Exposure |
|-------------------------|-----------------------|---------|--------------|----------|
| trichloroethylene       | LC50 Inhalation Vapor | Rat     | 140700 mg/m³ | 1 hours  |
|                         | LD50 Dermal           | Rabbit  | >20 g/kg     | -        |
|                         | LD50 Oral             | Rat     | 4920 mg/kg   | -        |

**IDLH** : 1000 ppm

#### **Irritation/Corrosion**

| Product/ingredient name | Result                   | Species | Score | Exposure               | Observation |
|-------------------------|--------------------------|---------|-------|------------------------|-------------|
| trichloroethylene       | Eyes - Moderate irritant | Rabbit  | -     | 24 hours 20 milligrams | -           |
|                         | Skin - Severe irritant   | Rabbit  | -     | 24 hours 2 milligrams  | -           |

#### **Sensitization**

Not available.

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# Section 11. Toxicological information

#### **Mutagenicity**

Not available.

#### Carcinogenicity

Not available.

#### **Classification**

| Product/ingredient name | OSHA | IARC | NTP  |
|-------------------------|------|------|--|
| trichloroethylene       | -    | 1    | Reasonably anticipated to be a human carcinogen. |

#### Reproductive toxicity

Not available.

#### **Teratogenicity**

Not available.

#### **Specific target organ toxicity (single exposure)**

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

#### **Aspiration hazard**

Not available.

Information on the likely

routes of exposure

: Not available.

#### Potential acute health effects

**Eye contact** : Causes serious eye irritation.

**Inhalation** : No known significant effects or critical hazards.

**Skin contact** : Causes skin irritation.

**Ingestion** : No known significant effects or critical hazards.

#### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact**: Adverse symptoms may include the following:, pain or irritation, watering, redness

Inhalation : No specific data.

**Skin contact**: Adverse symptoms may include the following:, irritation, redness

Ingestion : No specific data.

#### Delayed and immediate effects and also chronic effects from short and long term exposure

**Short term exposure** 

Potential immediate : Not available.

effects

Potential delayed effects : Not available.

Long term exposure

Potential immediate : Not available.

effects

Potential delayed effects : Not available.

#### Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

**Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : Suspected of causing genetic defects.

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Trichloroethylene

## **Section 11. Toxicological information**

Teratogenicity

Developmental effects

: No known significant effects or critical hazards.

Developmental effectsNo known significant effects or critical hazards.Fertility effectsNo known significant effects or critical hazards.

**Numerical measures of toxicity** 

**Acute toxicity estimates** 

Not available.

## **Section 12. Ecological information**

#### **Toxicity**

| Product/ingredient name | Result  | Species  | Exposure                         |
|-------------------------|---|--|----------------------------------|
| trichloroethylene       | Acute EC50 95000 µg/l Marine water<br>Acute EC50 36.5 mg/l Fresh water                                | Algae - Skeletonema costatum<br>Algae - Chlamydomonas<br>reinhardtii - Exponential growth<br>phase   | 96 hours<br>72 hours             |
|                         | Acute LC50 20 mg/l Marine water<br>Acute LC50 18 mg/l Fresh water<br>Acute LC50 3100 µg/l Fresh water | Crustaceans - Elminius modestus<br>Daphnia - Daphnia magna<br>Fish - Jordanella floridae -<br>Juvenile (Fledgling, Hatchling,<br>Weanling) | 48 hours<br>48 hours<br>96 hours |
|                         | Chronic EC10 12.3 mg/l Fresh water  | Algae - Chlamydomonas reinhardtii - Exponential growth phase   | 72 hours                         |
|                         | Chronic NOEC 10 mg/l Fresh water  | Daphnia - Daphnia magna  | 21 days                          |

#### Persistence and degradability

Not available.

#### **Bioaccumulative potential**

| Product/ingredient name | LogPow | BCF | Potential |
|-------------------------|--------|-----|-----------|
| trichloroethylene       | 2.53   | 17  | low       |

#### **Mobility in soil**

Soil/water partition coefficient (Koc)

: Not available.

Other adverse effects

: No known significant effects or critical hazards.

## Section 13. Disposal considerations

#### **Disposal methods**

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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Trichloroethylene

# Section 13. Disposal considerations

#### United States - RCRA Toxic hazardous waste "U" List

| Ingredient                            | CAS#    |        | Reference number |
|---------------------------------------|---------|--------|------------------|
| Trichloroethylene; Ethene, trichloro- | 79-01-6 | Listed | U228             |

# Section 14. Transport information

|                            | DOT   | TDG   | Mexico            | IMDG              | IATA  |
|----------------------------|---|---|-------------------|-------------------|---|
| UN number                  | UN1710  | UN1710  | UN1710            | UN1710            | UN1710  |
| UN proper shipping name    | TRICHLOROETHYLENE   | TRICHLOROETHYLENE   | TRICHLOROETHYLENE | TRICHLOROETHYLENE | TRICHLOROETHYLENE   |
| Transport hazard class(es) | 6.1   | 6.1   | 6.1               | 6.1               | 6.1   |
| Packing group              | III   | III   | III               | III               | III   |
| Environment                | No.   | No.   | No.               | No.               | No.   |
| Additional information     | Reportable quantity 100 lbs / 45.4 kg [8. 2147 gal / 31.096 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.  Limited quantity Yes.  Packaging instruction Passenger aircraft Quantity limitation: 60 L  Cargo aircraft Quantity limitation: 220 L  Special provisions IB3, N36, T4, TP1, T1 | Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.26-2.36 (Class 6).  Explosive Limit and Limited Quantity Index 5 |                   |                   | Passenger and Cargo AircraftQuantity Iimitation: 60 L Cargo Aircraft Only Quantity limitation: 220 L Limited Quantities - Passenger Aircraft Quantity limitation: 2 L |

<sup>&</sup>quot;Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according : Not available. to Annex II of MARPOL

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73/78 and the IBC Code

### Section 15. Regulatory information

**U.S. Federal regulations** 

: TSCA 5(a)2 final significant new use rules: trichloroethylene

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

TSCA 12(b) one-time export: trichloroethylene

United States inventory (TSCA 8b): This material is listed or exempted.

Clean Water Act (CWA) 307: trichloroethylene Clean Water Act (CWA) 311: trichloroethylene

Clean Air Act Section 112

(b) Hazardous Air **Pollutants (HAPs)** 

: Listed

Clean Air Act Section 602

**Class I Substances** 

: Not listed

**Clean Air Act Section 602** 

**Class II Substances** 

: Not listed

**DEA List I Chemicals** 

: Not listed

(Precursor Chemicals)

**DEA List II Chemicals** 

(Essential Chemicals)

: Not listed

#### **SARA 302/304**

#### **Composition/information on ingredients**

No products were found.

**SARA 304 RQ** : Not applicable.

**SARA 311/312** 

Classification : Immediate (acute) health hazard

Delayed (chronic) health hazard

#### **Composition/information on ingredients**

| Name              | %   | hazard | Sudden<br>release of<br>pressure |     | (acute) | Delayed<br>(chronic)<br>health<br>hazard |
|-------------------|-----|--------|----------------------------------|-----|---------|--|
| trichloroethylene | 100 | No.    | No.                              | No. | Yes.    | Yes.                                     |

#### **SARA 313**

|                                 | Product name      | CAS number | %   |
|---------------------------------|-------------------|------------|-----|
| Form R - Reporting requirements | trichloroethylene | 79-01-6    | 100 |
| Supplier notification           | trichloroethylene | 79-01-6    | 100 |

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

#### **State regulations**

**Massachusetts** : This material is listed. **New York** : This material is listed. **New Jersey** : This material is listed. : This material is listed. Pennsylvania

#### California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

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Trichloroethylene

## **Section 15. Regulatory information**

| Ingredient name   | Cancer | • |  | Maximum acceptable dosage level |
|-------------------|--------|---|--|---------------------------------|
| trichloroethylene | Yes.   |   | 14 μg/day (ingestion)<br>50 μg/day<br>(inhalation) | No.                             |

#### **International regulations**

**International lists** 

**National inventory** 

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : This material is listed or exempted.

Malaysia : This material is listed or exempted.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

**Canada** 

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).

Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).

**CEPA Toxic substances**: This material is listed. **Canadian ARET**: This material is not listed. **Canadian NPRI**: This material is listed.

Alberta Designated Substances: This material is not listed.

Ontario Designated Substances: This material is not listed.

Quebec Designated Substances: This material is not listed.

### **Section 16. Other information**

Canada Label requirements : Class D-1B: Material causing immediate and serious toxic effects (Toxic).

Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).

#### **Hazardous Material Information System (U.S.A.)**



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** 



Trichloroethylene

### Section 16. Other information

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

#### Procedure used to derive the classification

| Classification          | Justification   |
|-------------------------|-----------------|
| Skin Irrit. 2, H315     | Expert judgment |
| Eye Irrit. 2A, H319     | Expert judgment |
| Muta. 2, H341           | Expert judgment |
| Carc. 1, H350           | Expert judgment |
| Aquatic Chronic 3, H412 | Expert judgment |

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Key to abbreviations

: ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

IATA = International Air Transport Association

IBC = Intermediate Bulk Container

IMDG = International Maritime Dangerous Goods

LogPow = logarithm of the octanol/water partition coefficient

MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships,

1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

**UN = United Nations** 

References

: Not available.

▼ Indicates information that has changed from previously issued version.

#### **Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

#### SECTION 1: Identification of the substance/mixture and of the supplier

Product name: Zinc Metal Mossy, Reagent

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: S25636A

Recommended uses of the product and restrictions on use:

**Manufacturer Details:** 

AquaPhoenix Scientific, Inc 9 Barnhart Drive, Hanover, PA 17331 (717) 632-1291

#### **Supplier Details:**

Fisher Science Education 6771 Silver Crest Road, Nazareth, PA 18064 (724)517-1954

#### **Emergency telephone number:**

#### **Fisher Science Education**

Emergency Telephone No.: 800-535-5053

#### **SECTION 2: Hazards identification**

#### Classification of the substance or mixture:



#### Corrosive

Serious eye damage, category 1



#### **Irritant**

Acute toxicity (oral, dermal, inhalation), category 4



#### **Environmentally Damaging**

Acute hazards to the aquatic environment, category 1 Chronic hazards to the aquatic environment, category 1

Eye Damage 1.
Acute Toxicity 4 (oral).
Aquatic Acute Toxicity 1.
Aquatic Chronic Toxicity 1.

Signal word: Danger

#### **Hazard statements:**

Causes serious eye damage.

Harmful if swallowed.

Very toxic to aquatic life.

Very toxic to aquatic life with long lasting effects.

#### **Precautionary statements:**

If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Do not eat, drink or smoke when using this product.

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#### Zinc Metal Mossy, Reagent

Wear protective gloves/protective clothing/eye protection/face protection.

Wash skin thoroughly after handling.

Avoid release to the environment.

Rinse mouth.

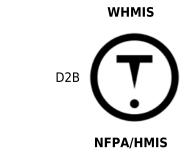
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

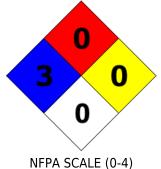
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER or doctor/physician.

Dispose of contents and container as instructed in Section 13.

#### Other Non-GHS Classification:







HMIS RATINGS (0-4)

#### **SECTION 3: Composition/information on ingredients**

| Ingredients:              |                           |       |  |  |  |
|---------------------------|---------------------------|-------|--|--|--|
| CAS 7446-20-0             | Zinc sulfate heptahydrate | 100 % |  |  |  |
| Percentages are by weight |                           |       |  |  |  |

#### **SECTION 4: First aid measures**

#### Description of first aid measures

#### After inhalation:

Loosen clothing as necessary and position individual in a comfortable position. Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen. Get medical assistance if cough or other symptoms appear.

#### After skin contact:

Rinse/flush exposed skin gently using soap and water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

#### After eye contact:

Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

#### After swallowing:

Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists. Never give anything by mouth to an unconscious person.

#### Most important symptoms and effects, both acute and delayed:

Irritation- all routes of exposure. Inhalation of fumes may cause metal fume fever, which is characterized by flulike symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. Headache. Nausea. Shortness of breath. May cause bronchitis.

#### Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

#### **SECTION 5: Firefighting measures**

#### **Extinguishing media**

#### Suitable extinguishing agents:

Use agent most suitable for extinguishing surrounding fire. Use water spray to keep fire-exposed containers cool.

#### **Unsuitable extinguishing agents:**

None identified.

#### Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode in the heat of a fire.

#### Advice for firefighters:

#### **Protective equipment:**

Wear protective eyeware, gloves, and clothing. Refer to Section 8. Use NIOSH-approved respiratory protection/breathing apparatus.

#### Additional information (precautions):

Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

#### **SECTION 6: Accidental release measures**

#### Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that air-handling systems are operational.

#### **Environmental precautions:**

Should not be released into environment. Prevent from reaching drains, sewer, or waterway.

#### Methods and material for containment and cleaning up:

Wear protective eyeware, gloves, and clothing. Refer to Section 8. Always obey local regulations. Containerize for disposal. Refer to Section 13. Sweep up and containerize for disposal. Avoid generating dust. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

#### Reference to other sections: None

#### **SECTION 7: Handling and storage**

#### Precautions for safe handling:

Avoid contact with skin, eyes, and clothing. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke, or use personal products when handling chemical substances.

#### Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages. Protect from freezing and physical damage.

according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

Provide ventilation for containers. Keep container tightly sealed. Store away from incompatible materials.

#### SECTION 8: Exposure controls/personal protection





Control Parameters: 7446-20-0, Zinc, ACGIH TLV: NA, OSHA PEL: NA.

**Appropriate Engineering controls:** Emergency eye wash fountains and safety showers should be available in

the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational

Exposure Limits-OELs) indicated above.

**Respiratory protection:** Not required under normal conditions of use. 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. When necessary use NIOSH approved

breathing equipment.

**Protection of skin:** Select glove material impermeable and resistant to the substance. Select

glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear

protective clothing.

**Eye protection:** Wear equipment for eye protection tested and approved under

appropriate government standards such as NIOSH (US) or EN 166(EU).

Safety glasses or goggles are appropriate eye protection.

**General hygienic measures:** Perform routine housekeeping. Wash hands before breaks and at the end

of work. Avoid contact with skin, eyes, and clothing. Before wearing wash

contaminated clothing.

#### SECTION 9: Physical and chemical properties

| Appearance (physical state, color): | Gray solid                                  | Explosion limit lower:<br>Explosion limit upper: | Not determined<br>Not determined                        |  |
|-------------------------------------|---|--|---|--|
| Odor:                               | Odorless                                    | Vapor pressure at 20°C:                          | 1 mmHg @ 487C   |  |
| Odor threshold:                     | Not determined                              | Vapor density:                                   | Not determined  |  |
| pH-value:                           | Not determined                              | Relative density:                                | Not determined  |  |
| Melting/Freezing point:             | 419C  | Solubilities:                                    | Reacts with water.                                      |  |
| Boiling point/Boiling range:        | 908C  | Partition coefficient (noctanol/water):          | Not determined  |  |
| Flash point (closed cup):           | INAT APTERMINEA                             | Auto/Self-ignition temperature:                  | 460C  |  |
| Evaporation rate:                   | Not determined                              | Decomposition temperature:                       | Not determined  |  |
| Flammability (solid, gaseous):      | Not determined                              | Viscosity:                                       | a. Kinematic: Not determined b. Dynamic: Not determined |  |
| Density at 20°C:                    | 7.14 g/cm3 at 20 °C Specific Gravity: :7.14 |  |   |  |

according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

#### SECTION 10: Stability and reactivity

#### Reactivity:

Nonreactive under normal conditions. Reacts with water.

#### Chemical stability:

Stable under normal conditions.

#### Possible hazardous reactions:

None under normal processing.

#### **Conditions to avoid:**

Incompatible materials. Excess heat.

#### Incompatible materials:

Oxidizing agents. Strong acids or bases.

#### **Hazardous decomposition products:**

Zinc oxides.

#### **SECTION 11: Toxicological information**

Acute Toxicity: No additional information.
Chronic Toxicity: No additional information.
Corrosion Irritation: No additional information.
Sensitization: No additional information.

Numerical Measures: No additional information.

Carcinogenicity:

EPA: IRIS Carcinogenicity Assessment- D (data are inadequate for an assessment of human carcinogenic potential; inadequate information to assess carcinogenic potential) Zinc

**Mutagenicity**: No additional information.

#### **Reproductive Toxicity:**

Reproductive effects shown in laboratory animals.

#### **SECTION 12: Ecological information**

#### **Ecotoxicity:**

Fish (acute 7440-66-6): : 96 Hr LC50 Pimephales promelas: 2.16 - 3.05 mg/L [flow-through]; 96 Hr LC50 Pimephales promelas: 0.211 - 0.269 mg/L [semi-static]; 96 Hr LC50 Pimephales promelas: 2.66 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 30 mg/L; 96 Hr LC50 Cyprinus carpio: 0.45 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 7.8 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 3.5 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 0.24 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 0.59 mg/L [semi-static]; 96 Hr LC50 Oncorhynchus mykiss: 0.41 mg/L [static]

Crustacea (acute 7440-66-6): : 48 Hr EC50 Daphnia magna: 0.139 - 0.908 mg/L [Static]

Algae (acute 7440-66-6): 96 Hr EC50 Pseudokirchneriella subcapitata: 0.11 - 0.271 mg/L [static]; 72 Hr EC50 Pseudokirchneriella subcapitata: 0.09 - 0.125 mg/L [static]

**Persistence and degradability**: No additional information. **Bioaccumulative potential**: No additional information.

**Mobility in soil**: No additional information.

Other adverse effects: No additional information.

according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

#### **SECTION 13: Disposal considerations**

#### Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed with household garbage. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). 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. Ensure complete and accurate classification.

#### **SECTION 14: Transport information**

#### **US DOT**

#### **UN Number:**

ADR, ADN, DOT, IMDG, IATA

Not Regulated.

Limited Quantity Exception:

**Bulk:** 

RQ (if applicable): None

**Proper shipping Name:** Not Regulated.

Hazard Class: None

Packing Group: Not Regulated.

Marine Pollutant (if applicable): No

additional information. **Comments:** None

Non Bulk:

None

**RQ** (if applicable): None

Proper shipping Name: Not Regulated.

Hazard Class: None

Packing Group: Not Regulated.

Marine Pollutant (if applicable): No

additional information. **Comments:** None

#### **SECTION 15: Regulatory information**

#### United States (USA)

#### SARA Section 311/312 (Specific toxic chemical listings):

None of the ingredients are listed.

#### SARA Section 313 (Specific toxic chemical listings):

7440-66-6 Zinc Compounds (N982).

#### RCRA (hazardous waste code):

7440-66-6 Zinc [Phase 4 LDR Rule - Universal Treatment Standards 2.61 mg/L (wastewater); 4.3 mg/L TCLP (nonwastewater)].

#### TSCA (Toxic Substances Control Act):

All ingredients are listed.

#### CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7440-66-6 Zinc 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is &qt;100 µm).

#### Proposition 65 (California):

according to 29CFR1910/1200 and GHS Rev. 3

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#### Zinc Metal Mossy, Reagent

#### Chemicals known to cause cancer:

None of the ingredients are listed.

#### Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

#### Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

#### Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

#### Canada

#### Canadian Domestic Substances List (DSL):

All ingredients are listed.

#### Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients are listed.

#### Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients are listed.

#### **SECTION 16: Other information**

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases: None

#### **Abbreviations and Acronyms:**

IMDG International Maritime Code for Dangerous Goods.

IATA International Air Transport Association.

GHS Globally Harmonized System of Classification and Labelling of Chemicals.

ACGIH American Conference of Governmental Industrial Hygienists.

CAS Chemical Abstracts Service (division of the American Chemical Society).

NFPA National Fire Protection Association (USA).

HMIS Hazardous Materials Identification System (USA).

WHMIS Workplace Hazardous Materials Information System (Canada).

DNEL Derived No-Effect Level (REACH).

PNEC Predicted No-Effect Concentration (REACH).

CFR Code of Federal Regulations (USA).

SARA Superfund Amendments and Reauthorization Act (USA).

RCRA Resource Conservation and Recovery Act (USA).

TSCA Toxic Substances Control Act (USA).

NPRI National Pollutant Release Inventory (Canada).

DOT US Department of Transportation.

**Safety Data Sheet** according to 29CFR1910/1200 and GHS Rev. 3

**Effective date** : 10.24.2014 Page 8 of 8

### Zinc Metal Mossy, Reagent

**Effective date**: 10.24.2014 **Last updated**: 06.19.2015

# **Appendix E:** Accident Report Form

# **Employee Accident Report**

| Name  | SS#                                     | EMPLOYEEEmp ID#                                |  |                    |            |
|---|---|--|--|--------------------|------------|
| Home Address  |   |  |  |                    |            |
| Street  | Age:                                    | city Employment Status: Full time              | zip code<br>Part time                    | phone              |            |
| Job Title   |   | Time in Present                                | Position Yrs _                           | Months             |            |
| Department  |   | Work Address                                   |  |                    |            |
| Supervisor  |   |  | building/room#                           | phone              |            |
| name  |   | building/room#                                 |  | phone              |            |
| Accident Date Time<br>What were you doing and using (tools, che   | am/pm L<br>micals, equipment,           | etc.) when the accident occurred?              | Describe what happened                   | ed.                |            |
| Was this part of your normal job duty?Parts of body affected or injured   |   |  |  |                    |            |
| Witnesses:  |   |  |  |                    |            |
| name<br>Report prepared by (if different from the in  | phone                                   | name   | phone                                    |                    |            |
| report prepared by (it different from the fi  | jureu employee)                         | name   | phone                                    |                    |            |
| I understand that it is my right to apply for more information regarding workers' compregarding this accident to the Prime Control  EMPLOYEE SIGNATURE: | pensation, call the lactors claim admin | New York State Department of Lab<br>istrators. | or. I also authorize rele                | ease of medical in | nformation |
|   | SUPER                                   | VISOR/CHARGE PERSON                            |  |                    |            |
| This accident was reported to me on   |   | atC  | ost Center/Dept #                        |                    |            |
| IS FURTHER INVESTIGATION REQUIR   | (date)<br>RED? Yes l                    | (time)   | 5000 10 10 10 10 10 10 10 10 10 10 10 10 |                    |            |
|   |   | Supervisor/Charge I                            | Person Signature                         | Date               |            |
|   | HEA                                     | LTH CARE PROVIDER                              | T.                                       |                    |            |
| Treated by:   |   |  |  |                    |            |
| Address   |   | signatu  |  |                    |            |
| name of facility  | str                                     | eet city                                       | state                                    | zip code           | phone      |
| Hospitalized overnight as inpatient?  | yesno                                   | (if emergency room only mark r                 | 10)                                      |                    |            |
| Diagnosis/Assessment  |   |  |  |                    |            |
| Parts of body affected  |   |  |  |                    |            |
| Reaggravation of previous work injury?  |   | U CONTRA TOTAL N                               |  |                    |            |

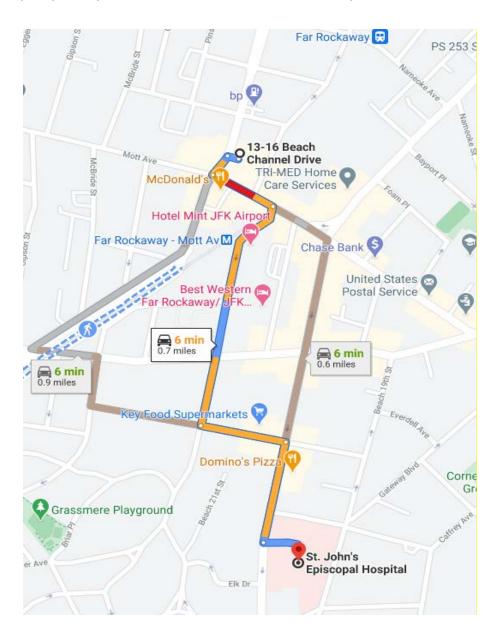
# Appendix F:

Directions to nearest Hospital and Map

#### Start: 13-16 to 13-24 Beach Channel Drive

- Head south-southwest on Beach Channel Drive toward Mott Avenue 0.03mi
- Turn left onto Mott Avenue towards Beach 22<sup>nd</sup> Street 0.08mi
- Turn right onto Beach 22<sup>nd</sup> Street towards New Haven Avenue 0.3mi
- Turn left onto New Haven Avenue towards Beach 20<sup>th</sup> Street 0.1mi
- Turn right onto Beach 20<sup>th</sup> Street Destination will be on the left- 0.1 mi

End: St John's Episcopal Hospital - 327 Beach 19th Street, Far Rockaway, NY 11691



# Appendix E

# Quality Assurance Project Plan

Remedial Action Work Plan
NYSDEC BCP #C241254



# REMEDIAL ACTION QUALITY ASSURANCE PROJECT PLAN

#### NYSDEC BROWNFIELD CLEANUP PROGRAM

Submitted for:

13-16 to 13-24 Beach Channel Drive
Far Rockaway, New York 11691
New York City Tax Map Designation: Block 15228; Lots 5, 6, and 9

Submitted to:

New York State Department of Environmental Conservation Chief, Site Control Section Region 2, Division of Environmental Remediation 47-40 21st Street Long Island City, NY

Prepared for:

BCD Owner LLC 419 Park Avenue South, 4<sup>th</sup> Floor New York, New York

January 28, 2022

IEC Project Number: #15209



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#### 1 INTRODUCTION

Impact Environmental Closures, Inc. (Impact) has been retained by BCD Owner LLC to prepare a Remedial Action Work Plan (RAWP) for a property located at 13-12 to 13-24 Beach Channel Drive, within the Far Rockaway section of Queens County, New York ("Site"), in accordance with the provisions of the New York State Department of Environmental Conservation's Brownfield Cleanup Program.

This Quality Assurance Project Plan (QAPP) provides an outline of the field and laboratory procedures that will be used during the post Remedial Action (RA) sampling proposed for the Site. The QAPP is used to ensure the accuracy and precision of data collected and interpreted during the post RA sampling in order to meet project requirements. The QAPP identifies procedures for sample collection to maintain consistency among datasets and mitigate the potential for cross-contamination, as well as analytical requirements necessary to allow for independent data validation. A Sampling and Analysis Plan (SAP) identifying methods for sample collection, decontamination, handling and shipping, is provided in the following sections.

This QAPP has been prepared in accordance with United States Environmental Protection Agency (USEPA) *Requirements for Quality Assurance Project Plans*; the USEPA Region II *CERCLA Quality Assurance Manual*, and New York State Department of Environmental Conservation (NYSDEC) *DER-10 Technical Guidance for Site Investigation and Remediation* (May 2010) and subsequent updates.

#### 1.1 Scope and Goals

This QAPP has been prepared to support the post remedial action sampling activities planned for the Site. The goals of the RA are to remove contaminated soil and treat contaminated groundwater identified during Remedial Investigation activities and collect additional data to support efficacy of the remedial actions. This QAPP was prepared to provide quality assurance guidelines to be implemented during the post RA sampling activities to fulfill the RA goals for the Site. This document may be modified for subsequent phases of investigative work, as necessary. The QAPP provides:

- A means to communicate exactly what is to be done, by whom, and when to the individuals
  executing the various activities;
- A culmination to the planning process that ensures that the program includes provisions for obtaining quality data (e.g., suitable methods of field operations);
- A historical record that documents the sampling activities in terms of the methods used, calibration standards and frequencies planned, and auditing planned;
- A document that can be used by the Project Manager's and the QA Officer to assess if the activities planned are being implemented and their importance for accomplishing the goal of

quality data;

- A plan to document and track project data and results; and,
- Detailed descriptions of the data documentation materials and procedures, project files, and tabular and graphical reports.

The QAPP is primarily concerned with the quality assurance (QA) and quality control (QC) aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples; field testing; record keeping; data management; chain-of-custody procedures; laboratory analyses; and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be defended.

QA refers to the conduct of all planned and systematic actions necessary to perform satisfactorily all task-specific activities and to provide information and data confidence as a result of such activities. The QA for task-specific activities includes the development of procedures, auditing, monitoring and surveillance of the performance.

QC refers to the activity performed to determine if the work activities conform to the requirements. This includes activities such as inspections of the work activities in the field (e.g., verification that the items and materials installed conform to applicable codes and design specifications). QA is an overview monitoring of the performance of QC activities through audits rather than first time inspections.

#### 1.2 Cleanup Criteria and Laboratory Reporting Limits

The following soil cleanup criteria will be used to evaluate the analytical data collected as part of the RA sampling:

Soil: 6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives (SCOs) listed in

Table 375-6.8(b), Protection of Public Health Restricted Use SCOs and the Protection of

Groundwater SCOs listed in Table 375-6.8(b).

The following groundwater cleanup criteria will be used to evaluate the analytical data collected following completion of the RA:

Groundwater: 6 NYCRR Part 703 Groundwater Quality Standards and the NYSDEC Division of Water

Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Stand-

ards and Guidance Values

The environmental analytical laboratory selected for this RA must have reporting limits that are low enough to meet the above referenced cleanup standard and QA/QC objectives specified in NYSDEC DER-10 Remedial Program Guidance. As part of project planning and throughout the project life cycle, the environmental consultant will maintain close communications with the contracted laboratory to convey the necessity for establishing and achieving data reporting goals. Additional information regarding the contracted lab and reporting limits are provided in *Section 4.6* of this document.

#### 2 QAPP ORGANIZATION AND RESPONSIBILITY

The principal organizations involved in verifying achievement of data collection goals for the Site include: the NYSDEC, NYSDOH, Applicant, Consultant, drilling subcontractor(s), independent environmental laboratory and the independent third-party data validator. Roles, responsibilities, and required qualifications of these organizations are discussed in the following subsections.

#### 2.1 NYSDEC and NYSDOH

It is the responsibility of the NYSDEC, in conjunction with NYSDOH, to review the RIWP and supporting documents, for completeness and conformance with the site-specific cleanup objectives and to make a decision to accept or reject these documents based on this review. The NYSDEC also has the responsibility and authority to review and approve all QA documentation collected during brownfield cleanup construction and to confirm that the QAPP was followed.

#### 2.2 Applicant

BCD Owner LLC ("Applicant") will be responsible for complying with the QA requirements as specified herein and for monitoring and controlling the quality of the Brownfield cleanup construction either directly or through their designated environmental consultant and/or legal counsel. The Applicant will also have the authority to a select Remedial Action Contractor(s) to assist them in fulfilling these responsibilities. The designated Project Manager is responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements.

#### 2.3 Environmental Consultant

Impact is the prime consultant on this project and is responsible for the performance of the services required to implement each phase of the RAWP, including, but not limited to, field operations, laboratory testing, data management, data analysis and reporting. Any one member of Impact's staff may fill more than one of the identified project positions (e.g., field team leader and site safety and health officer). The various quality assurance, field, laboratory, and management responsibilities of key project personnel are defined below and the resumes are provided in **Appendix A**.

#### Impact Project Manager (PM): Chris Connolly

The Impact PM has the responsibility for ensuring that the project meets the Work Plan objectives. The PM will report directly to the by BCD Owner LLC Project Coordinator and the NYSDEC/NYSDOH Project Coordinators and is responsible for technical and project oversight. The PM will:

• Define project objectives and develop a detailed work plan schedule.

- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task.
- Acquire and apply technical and corporate resources as needed to assure performance within budget and schedule constraints.
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Review the work performed on each task to assure its quality, responsiveness, and timeliness.
- Review and analyze overall task performance with respect to planned requirements and authorizations.
- Review and approve all deliverables before their submission to NYSDEC.
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Ultimately be responsible for the preparation and quality of interim and final reports.
- Represent the project team at meetings.

#### Impact Field Team Leader: Alex Keenan

The Field Team Leader (FTL) has the responsibility for implementation of specific project tasks identified at the Site and is responsible for the supervision of project field personnel, subconsultants, and subcontractors. The FTL reports directly to the Project Manager. The FTL will:

- Define daily work activities.
- Orient field staff concerning the project's special considerations.
- Monitor and direct subcontractor personnel.
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness.
- Assure that field activities, including sample collection and handling, are carried out in accordance with this QAPP.

For this project, the FTL will also serve as the Site Safety and Health Officer (SSHO). As such, he is responsible for implementing the procedures and required components of the Site Health and Safety Plan (HASP), determining levels of protection needed during field tasks, controlling site entry/exit, briefing the field team and subcontractors on site-specific health and safety issues, and all other responsibilities as identified in the HASP.

#### <u>Impact Field Personnel:</u>

The field personnel hold a minimum of a bachelor's degree in a relevant natural or physical science or engineering. The field personnel will complete the collection of environmental samples from the Site in accordance with the requirements of the remedial investigation work plan and the QAPP and oversee subcontractor work. The field personnel will:

- Implement sample collection protocols in accordance with applicable procedures for soil and groundwater sample collection.
- Ensure quality control procedures are being implemented.
- Ensure adherence to and successful completion of RAWP tasks.
- Oversee subcontractors to ensure field work is completed in accordance with the RAWP and QAPP.
- Record field notes and provide daily updates on work progress.

#### 2.4 Quality Assurance (QA) Responsibilities

The QA Officer will have direct access to corporate executive staff as necessary, to resolve any QA dispute, and is responsible for auditing the implementation of the QA program in conformance with the demands of specific investigations and Impact policies, and NYSDEC requirements. The QA Officer has sufficient authority to stop work on the investigation as deemed necessary in the event of serious QA issues. The resume for the QA Officer is provided in **Appendix B**.

#### Impact Project QA Officer: Donald Peters

Specific function and duties include:

- Performing QA audits on various phases of the field operations.
- Reviewing and approving QA plans and procedures.
- Providing QA technical assistance to project staff.
- Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the Project
   Manager for technical operations.
- Responsible for assuring third party data review of all sample results from the analytical laboratory.

#### 2.5 Field Responsibilities

Impact field staff for this project is drawn from a pool of qualified resources. The Project Manager will use staff to gather and analyze data, and to prepare various task reports and support materials. The designated technical team members are experienced professionals who possess the degree of specialization and technical competence required to perform the required work effectively and efficiently. The resumes for field personnel are provided in **Appendix C**.

#### 3 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall objectives and criteria for assuring quality for this effort are discussed below. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented. The objectives of this QAPP are to address the following:

- The procedures to be used to collect, preserve, package, and transport soil and groundwater samples.
- Field data collection.
- Record keeping.
- Data management
- Chain-of-custody procedures.
- Precision, accuracy, completeness, representativeness, decision rules, comparability and level of quality control effort conformance for sample analysis and data management by Alpha Analytical under EPA analytical methods.

#### 3.1 Level of QC Effort for Sample Parameters

Method blank, field duplicate, laboratory duplicate, laboratory control, standard reference materials (SRM) and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. QC samples are discussed below.

- Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures.
- Duplicate samples are analyzed to check for sampling and analytical reproducibility.
- MS/MSD and MS/Duplicate samples provide information about the effect of the sample matrix
  on the digestion and measurement methodology. Depending on site-specific circumstances, one
  MS/MSD or MS/Duplicate should be collected for every 20 or fewer investigative samples to be
  analyzed for organic and inorganic chemicals of a given matrix.
- Equipment field blank samples are used to determine if specific materials utilized in sample collection can cross contaminate the sample.

The general level of QC effort will be one field (blind) duplicate and one equipment field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow site-specific MS/MSD or MS/Duplicate for every 20 or fewer investigative samples of a given matrix. One trip blank consisting of distilled, deionized water will be included along with each sample delivery group of aqueous VOC samples. Equipment field blanks will be collected at a frequency of 1 per day for all PFAS and 1,4-dioxane sampling for each matrix. Number of all QA samples are included in Table 1.

#### 4 SAMPLING AND ANALYSIS PLAN

The selection, rationale and map for the RA sampling program are discussed and presented in Plate 7 of the RAWP. Methods and protocols to be used for collection of environmental samples (i.e., soil and groundwater) for the post RA sampling are described in the Impact Field Operating Procedures (FOPs) presented in **Appendix D**. The overall investigative planning process pursues to target specific matrices in locations of potential concern based on current/historical uses and/or site conditions. Once a sample group meets data quality objectives, analysis is considered valid and used to determine if values exceed state designated guidance values. Based on data evaluation the generated conceptual site model can inform the efficacy of the remedial action.

The number and types of environmental samples to be collected are summarized on **Table 1.** Sample parameter lists, holding times and sample container requirements are summarized on **Table 2.** The sampling program and related site activities are discussed below. To the extent allowed by existing physical conditions at the facility, sample collection efforts will adhere to the specific methods presented herein. If alternative sampling locations or procedures are implemented in response to facility specific constraints, each will be selected on the basis of meeting data quality objectives. Such alternatives will be approved by NYSDEC before implementation and subsequently documented for inclusion in the project file.

#### 4.1 Custody Procedures

Sample custody is controlled and maintained through the chain-of-custody procedures. Chain of custody is the means by which the possession and handling of samples will be tracked from the source (field) to their final disposition, the laboratory. A sample is considered to be in a person's custody if it is in the person's possession or it is in the person's view after being in his or her possession or it was in that person's possession and that person has locked it in a vehicle or room. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site. The following section and FOPs for Sampling, Labeling, Storage, and Shipment, located in Appendix B, describe procedures for maintaining sample custody from the time samples are collected to the time they are received by the analytical laboratory.

#### 4.2 Sample Storage

Samples are stored in secure limited-access areas. Walk-in coolers or refrigerators are maintained at 4 degrees Celsius (°C), or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location if necessary.

#### 4.3 Sample Custody

Sample custody is defined by this document as when any of the following occur:

- It is in someone's actual possession.
- It is in someone's view after being in his or her physical possession.
- It was in someone's possession and then locked, sealed or secured in a manner that prevents unsuspected tampering.
- It is placed in a designated and secured area.

Samples are removed from storage areas by the sample custodian or analysts and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure. If required by the applicable regulatory program, internal chain-of-custody is documented in a log by the person moving the samples between laboratory and storage areas.

Laboratory documentation used to establish COC and sample identification may include the following:

- Field COC forms or other paperwork that arrives with the sample.
- The laboratory COC.
- Sample labels or tags are attached to each sample container.
- Sample custody seals.
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books that are filled out in legible handwriting and signed and dated by the chemist.
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting and signed and dated by the chemist.
- Sample storage log (same as the laboratory COC).
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

#### 4.4 Sample Tracking

All samples are maintained in the appropriate coolers prior to and after analysis. The analysts remove and return their samples as needed. Samples that require internal COC are relinquished to the analysts by the sample custodians. The analyst and sample custodian must sign the original COC relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original COC returning sample custody to the sample custodian. Sample extracts are relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department tracks internal COC through their logbooks/spreadsheets. Any change in the sample during the time of custody will be noted on the COC (e.g., sample breakage or depletion).

#### 4.5 Field Instrument Calibration

This section describes the calibration procedures and the frequency at which these procedures will be performed for instruments.

#### 4.5.1 Instrument Calibration and Tuning

Calibration of instrumentation is required to ensure that the analytical system is operating correctly and functioning at the proper sensitivity to meet established reporting limits. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the linear range established for the analytical method. The frequency of calibration and the concentration of calibration standards is determined by the manufacturer's guidelines, the analytical method, and/or laboratory's internal Quality Assurance Plan.

#### 4.5.2 Field Instrument Calibration

Calibration of the field instruments will be completed prior to each day's use in accordance with the manufacturer's instructions. The field equipment will be maintained, calibrated, and operated in a manner consistent with the manufacturer's guidelines and standard use methods. Quantitative field measurements will be limited to organic vapor readings (Photoionization Detector). Records of calibration, repair or replacement will be filed and maintained by the Field Team Leader.

#### 4.6 Analytical Procedures

A single laboratory will be utilized for analysis of the soil and groundwater samples collected during the post RA field sampling activities. The selected analytical laboratory for this project is Alpha Analytical of Westborough, Massachusetts. Alpha is certified by the NYSDOH Environmental Laboratory Approval Program (ELAP) Number 11148. The laboratory analyses will be in accordance with the most recent version of the NYSDEC Analytical Services Protocol (ASP) and the laboratory's internal Quality Assurance Plan. The lab will provide a Category B data deliverable.

The analytical methods Alpha will use for samples collected to delineate contaminants during the post RA sampling include:

| Analytical Methods for Soil Samples |  |
|-------------------------------------|--|
| USEPA Method 8260C/5035             | Target Compound List (TCL) Volatile Organic Compounds (VOCs) + Tentatively Identified Compounds (TICs) |

| Analytical Methods for Groundwater Samples |                 |
|--|-----------------|
| USEPA Method 8260C                         | TCL VOCs + TICs |

All other reporting and deliverables (i.e., waste characterization samples, geochemistry data for remedial action evaluation) will be in accordance with Standard Laboratory Procedure.

Alpha has provided a series of tables that contain the analytical parameters for soil with the applicable reporting limits, method detection limits, containers and hold times. The Alpha tables are provided in **Appendix E**. Alpha has also provided the SOP for the PFAS analysis which is provided in **Appendix F**.

#### 4.7 Data Validation/ Usability Evaluation

The analytical laboratory data package will be validated by Christina Rink-Ashdown with Laboratory Data Consultants, Inc of Carlsbad, CA (LDC, Inc.), an independent/third-party data validator subcontractor, in accordance with the NYSDEC Division of Environmental Remediation DER-10, Appendix 2B(b) DEC Analytical Services Protocol Category B Data Deliverable. Refer to **Appendix G** for resume of the third-party data validator.

#### 4.7.1 Procedures Used to Evaluate Data Usability

The sample analytical data for each sample matrix shall be evaluated and include, but are not limited to:

- Lab Report Narrative Review
- Data Package Completeness and COC records
- Sample Preservation and Holding Times
- Initial and Continuing Calibration
- QC Blanks
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Surrogate Spikes
- Internal Standard Response and Retention Times
- Laboratory Duplicates
- Field Duplicates
- Raw Data (chromatograms), Calculation Checks and Transcription Verifications
- Reporting Limits

#### 4.7.2 Data Usability Summary Report (DUSR)

The DUSR will provide an evaluation of the analytical data to determine whether the data meets the criteria of a NYSDEC ASP Category B data deliverable and meets the data quality objectives for the project.

#### 4.7.3 Data Submissions/ Electronic Data Deliverables

The Analytical Services Protocol (ASP) Category B data packages and an electronic data deliverable (EDD) will be provided by the laboratory after receipt of a complete sample delivery group. The Project Manager will immediately arrange for archiving the results and preparation of result tables. These tables will form the database for assessment

of the site contamination condition. Each EDD deliverable must be formatted using a Microsoft Windows operating system and the NYSDEC data deliverable format for EQuIS. To avoid transcription errors, data will be loaded directly into the ASCII format from the laboratory information management system. If this cannot be accomplished, the consultant should be notified via letter of transmittal indicating that manual entry of data is required for a particular method of analysis. All EDDs must also undergo a QC check by the laboratory before delivery. The original data, tabulations, and electronic media are stored in a secure and retrievable fashion. The Project Manager or Task Manager will maintain close contact with the QA reviewer to ensure all non-conformance issues are acted upon prior to data manipulation and assessment routines. Once the QA review has been completed, the Project Manager may direct the Team Leaders or others to initiate and finalize the analytical data assessment.



## Table 1. Post Remedial Action Analytical Program Summary 13-16 to 13-24 Beach Channel Drive, Queens, New York

|   | Number of Samples and QA/QC Blanks |            |                   |              |                                     |                    |
|---|------------------------------------|------------|-------------------|--------------|-------------------------------------|--------------------|
| Sample Media  | Total Field<br>Samples             | Duplicates | MS/MSD<br>Samples | Field Blanks | Trip Blanks                         | Analyses           |
| Soil Samples<br>(post hotspot excavation endpoint<br>samples) | 10                                 | 1          | 1                 | 1            | 1/Cooler<br>Containing<br>Volatiles | TCL VOCs plus TICs |
| Groundwater Samples   | 5                                  | 1          | 1                 | 1            | 1/Cooler<br>Containing<br>Volatiles | TCL VOCs plus TICs |

NOTES:

MS = Matrix Spike

VOCs = Volatile Organic Compounds

MSD = Matrix Spike Duplicate

TICs - Tentatively Identified Compounds

TCL = Target Compound List

NYSDEC - New York State Department of Environmental Conservation

| Table 2: Summary of Sample Parameters, Holding Times and Sample Container Requirements |
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# Table 2. Summary of Sample Parameters, Holding Times and Sample Container Requirements 13-16 to 13-24 Beach Channel Drive, Queens, New York

| Sample Matrix  | Test Method                    | Parameters   | Containers         | Preservation    | Holding Times     |
|--|--------------------------------|--------------|--------------------|-----------------|-------------------|
| Soil   | USEPA SW846 Method 5035A/8260C | TCL VOC+TICs | Terra Core         | Water, 4 °C     | 48 Hours/14 Days* |
| * The holding time for VOCs is soil is 48-hours, until the sample is aliquoted and extruded into two (2) sealed vials with DI water and frozen to -7°C and one (1) sealed vial with methanol, then the hole time is extended to 14 days. |                                |              |                    |                 |                   |
| Groundwater  | USEPA SW846 Method 8260C       | TCL VOC+TICs | 3 - 40ml VOA Vials | HCL, pH<2, 4 °C | 14 days           |



## CHRISTOPHER CONNOLLY

PROJECT MANAGER



## **EDUCATION**

Bachelor of Science, Music Technology and Studio Systems Design-, University of Rhode Island (2008)

## **EXPERIENCE**

## 2015-Present IMPACT ENVIRONMENTAL Project Manager

- Conducts visual inspections and produces Phase I Environmental Site Assessments.
- Arranges, organizes, and oversees Phase II Environmental Site Assessments and Limited Subsurface Investigations.
- Arranges and oversees small, moderate and large-scale remediation projects, including communication with disposal facilities, subcontractors, Clients and regulatory agencies, as applicable.
- Produces Work Plans, Final Engineering Reports and other associated regulatory reports.
- Conducts various methods of soil and groundwater sampling, groundwater monitoring, well purging & sampling, and soil vapor sampling.

## 2010-2015 **Laurel Environmental Associates.** Environmental Scientist

- Conducts visual inspections of Phase I & II Environmental Site Assessments.
- Writes Transaction screen and Phase I, II, and III Environmental Site Assessments, Remedial Action Work Plans (RIWP), Environmental Assessment Statements (EAS) and Supplemental Studies reports, as well as New York City Office of Environmental Remediation Voluntary Cleanup Program Reports.
- Assists in Phase II site operations.
- Organizes, arranges logistics, and oversees small to large scale remediation projects, with accurate communication with disposal facility, trucking, developer and regulatory agency required. Conducts associated CAMP monitoring and writes Daily Reports.
- Conducts various methods of soil and groundwater sampling, groundwater monitoring, well purging & sampling, and soil vapor sampling.
- Experience operating and assisting with truck-mounted, track-mounted and portable Geoprobe® machines and tooling.
- Conducts ground penetrating radar, magnetic and utility surveys.
- Completed OSHA 24-Hour HAZWOPER Training program.
- Conducts Nuisance Noise and Excessive Vibration monitoring assessments.
- Project manages numerous NYC OER Voluntary Cleanup Projects, dealing with the remediation and continuing use of Brownfields sites.

## **KEY PROJECTS**

- KENSINGTON ROAD, Bronxville, NY.
  - 1.63-acre New York State
     Department of Environmental
     Conservation Brownfields Cleanup
     Program (BCP) Remediation:
     Oversight, Reporting, Agency, client
     and developer coordination.
- RCRA Closure projects, activities and reports.
- CEQR EAS Reports, OER Work Plans, OER Final Engineering Reports.
- Gasoline Station Portfolio Phase I and II ESAs

- OSHA Health and Safety for Hazardous Waste Site Investigation Personnel Certification, 40 Hours
- OSHA Construction Safety Curse, 10 Hours





## **KEVIN KLEAKA, P.G.**

Executive Vice President/Senior Environmental Scientist



## **EDUCATION**

## State University of New York at Plattsburg,

Bachelor of Science in Environmental Science, 1995 Applied Environmental Science Program

## **EXPERIENCE**

(1997-Present) – **IMPACT ENVIRONMENTAL CLOSURES Inc.,** *Executive Vice President, Senior Environmental Scientist* 

- Principally responsible for managing environmental assessment, investigation, construction and remediation projects in commercial and industrial markets for lenders, real estate investment/development firms, construction firms and government agencies.
- Manage Phase I and II Environmental Site Assessments, State Spill Investigation and Remediation, County and Federal Underground Injection Control Programs, State & City Voluntary/Brownfield Cleanup Programs, State & Federal Superfund Sites, Brownfield Environmental Restoration Programs, Federal RCRA Closure, City E-Designation Projects.
- Responsible for environmental compliance of construction projects for waste management.
- Quality control of work products and deliverables.
- Supervise staff of geologists, hydrogeologists, engineers, environmental scientists, and environmental technicians to develop and implement sampling and analysis plans, quality assurance programs, remedial action plans.
- Provide expert witness testimony/fact statements and support in litigation cases involving soil, air and/or groundwater pollution.

(1995-1997) – **WYETH AYERST LABORATORIES**, Chemist worked in chromatographic separations division performing quality assurance analysis.

 Performed laboratory procedures and analyses in accordance with USFDA analytical test methods by liquid, gas, and thin layer chromatography.

## **KEY PROJECTS**

- East Side Access MTA LIRR
- Melody Cleaners
- ExxonMobil Spill- Valley Stream, NY
- Spartan Petroleum
- JFK 1020, Runway 13R-31L
- · Rheingold Brewery Redevelopment Project
- WTC Greenwich Street Corridor Reconstruction
- Yankee Stadium Macomb's Park

## **ORGANIZATIONS**

- New York City Brownfield Partnership
- · New Partners for Community Revitalization
- ASTM Committee
- National Groundwater Association
- Environmental Bankers Association
- Vapor Intrusion Network
- Long Island Geologist Association
- Environmental Consulting Professionals
- Environmental Insurance Professionals

- Licensed Profession Geologist (NYS# 000735)
- Gold Certified Brownfield Professional 2012
- Advanced Tools for In-Situ Remediation Workshop
- ASTM Technical & Professional Training for Assessment of Vapor Intrusion into Structures of Property & New York State Department of Health, Vapor Intrusion Training
- New York Precision Equipment Global Survey Positioning Training
- MTBE & TBA Comprehensive Site Assessment and Successful Groundwater Remediation
- Environmental Data Resources, Due Diligence Workshop
- Advanced Technologies for Accelerated Natural Attenuation
- Eophysical Survey Systems, Theory and Practice of Applying Subsurface Interface Radar in Engineering and Geophysical Investigation.
- 40-Hour Occupational Safety & Health Administration

## **GREG MENDEZ-CHICAS**

SENIOR PROJECT MANAGER



## **EDUCATION**

Bachelor of Science, Environmental Science, SUNY at Plattsburgh (2007)

## **EXPERIENCE**

IMPACT ENVIRONMENTAL, 2009-Present, Senior Project Manager

- Direct and supervise staff of geologists, hydrogeologists, and environmental engineers in development and implementation of environmental assessments, investigations, construction and remediation projects in commercial and industrial markets for lenders, real estate investment/development firms, construction firms and government agencies.
- · Provide regulatory and technical guidance and strategy
- Manage Phase I and Phase II assessments, State Spill
   Investigation and Remediation, County and Federal
   Underground Injection Control Programs, State & City
   Voluntary/Brownfield Cleanup Programs, State & Federal
   Superfund Sites, Brownfield Environmental Restoration
   Programs, Federal RCRA Closure, City E-Designation Projects.
- Quality control of project budgets, efficiencies, and profitability
- Maintain key relationships with existing clients, and cultivate the development of new business and growth.

## APEX COMPANIES, 2007-2009, Environmental Scientist

- Prepared Phase I Environmental Assessments (ESAs) in general conformation with ASTM Practice E-1527-05 and USEPA ALL Appropriate Inquiries (AAI).
- Performed various aspects of Phase II scopes of work for commercial and industrial properties.
- Conducted microbiological sampling/investigations at a medical equipment manufacturing facility
- Preparation and implementation of sub-slab soil vapor sampling plans at former utilized gasoline and/or dry cleaning operations.

## **KEY PROJECTS**

- LIRR/MTA East Side Access (five contracts)
- Briarcliff Manor
- Saint Barnabas Hospital Expansion

- OSHA 40-hour HAZWOPER Training
- OSHA 8-hour Refresher (2007-to-present)
- OSHA 10-hour Construction Training (2016)
- New York State Licensed Asbestos Inspector (2007-to-present)
- NYSDEC Erosion & Sediment Control Training (2016)
- Amtrak (2016) & LIRR Roadway Safety Training (2017)
- New York City Office of Environmental Remediation – Certified Brownfield Professional (Silver Certification)

## **DANIEL FRUHAUF**

Associate Project Manager



## **EDUCATION**

Bachelor of Arts, Ecosystems & Human Impact. SUNY at Stony Brook (2012)

## **EXPERIENCE**

2014-Present IMPACT ENVIRONMENTAL Associate Project Manager

- Responsible for management and logistical coordination of investigative and remedial tasks, schedule and implementation quality on very large to small clean-up projects within NYC, Long Island, NY and East Chicago, Indiana
- Developed and prepared various environmental planning documents approved by regulators including, Remedial Action Work Plans, Corrective Measures Implementation Work Plan, Health and Safety Plans, Waste Characterization Work Plans, Community Air Monitoring Plans, Phase II ESA Work Plans, Underground Storage Tank Removal Work Plan, etc.
- Responsible for developing complex methods of tracking and incorporating innovative technology to measure remedial completion for adequate reporting purposes
- Assembled proposals, work orders, change orders and general contracts for multiple clients
- Performed complex Phase II Assessments and other Subsurface Investigations to detect and target specific contaminants for delineation purposes.
- Designed and constructed various remedial systems including sub-slab depressurization systems, soil vapor extraction systems.
- Conducted, presented and attended multiple regulator meetings with USEPA, NYSDEC, NYC OER.
- Provided a professional attitude of always learning, exploring new methods and teaching along the way

## 2013-2014 SOVEREIGN CONSULTING Inc. Environmental Scientist

- Collected field data, soil, groundwater samples from various NYSDEC regulated Spill Sites and other hazardous waste sites
- Assisted in construction and design of SVE, SSDS and product skim systems at multiple tri-state clean-up projects
- Prepared various reporting components specific to NYSDEC Quarterly Monitoring Reports, Phase I ESA, Phase II ESA and owner liability risk assessments
- Provided contractor oversight and split sampling with multiple environmental contractors on various clean-up and development projects
- Engaged in various meetings with regulators as to develop cleanup strategies for complex projects

## **KEY PROJECTS**

- Former Du Pont East Chicago Facility RCRA CA Clean-up Project, East Chicago, IN
- Independent Metal Strapping NYSDEC/RCRA Closure, Roslyn, NY
- Multiple MTA/ LIRR Development Projects NYC, LI NY
- Saint Barnabas Hospital Development Project – Bronx NY
- Multiple NYC OER regulated Commercial Development Projects - NYC

- HAZWOPER 40hr + 8hr Refreshers
- OSHA 10hr Construction Safety
- OSHA 30hr Construction Safety
- Transportation Worker Identification Card (TWIC)
- NYC Office of Environmental Remediation (OER) Trained
- MTA/Amtrak Track Safety
- MTA/NYC Transit Track Safety
- · LIRR Safety Blue Card
- NYSDEC SWPPP Certified Inspector
- · Certified NYSDOL Asbestos Inspector

## XIN YUAN, P.E.

**Quality Control Manager** 

## **EDUCATION**

Masters of Science, Civil Engineering, UMass Amherst (2010)

Bachelor of Science, Environmental Engineering. Tsinghua University, Beijing, China (2008)

#### **EXPERIENCE**

2010-Present **IMPACT ENVIRONMENTAL** *Quality Control Manager/Environmental Analyst* 

- Quality control of all waste management/brownfield redevelopment projects;
- Management of site remediation/waste management projects;
- Environmental compliance & permitting of waste management facilities
- Achieve and maintain appropriate and consistent application of environmental compliance for waste disposal/beneficial use facilities
- Achieve and maintain appropriate and consistent application of environmental compliance at the regional Levels for waste management projects
- Review & evaluate site investigation/waste characterization results for waste management projects and provide technical recommendations to project manager
- Authored a multitude of BUD petitions for various other solid waste related projects in NY,NJ &PA, including projects such as The East Side Access, The Air Rail Project and JFK International Jet Blue Terminal 5
- Design and perform waste characterization investigations for waste management projects

## **KEY PROJECTS**

- Columbia University Manhattanville Development Project
- LIRR 3rd Track Expansion Project
- Atlas Quarry Reclamation Project
- Former New Jersey Zinc Company-West Plant Remediation Project
- Morris Blanchard Redevelopment Project
- Brooklyn Bridge Park Pier 1 Redevelopment Proiect
- Southwest Brooklyn Marine Transfer Station Redevelopment Project
- Doremus Avenue Redevelopment Project

## **CERTIFICATIONS/ ACHIEVEMENTS**

- Long Island Association of Professional Geologists
- American Chinese Real Estate Society

- US EPA 40hr Hazardous Materials Response for First Responders Training
- Professional Engineer in MA, PA, NJ & NY

## JULIANA DE LA FUENTE, P.G.

SENIOR PROJECT MANAGER

## **EDUCATION**

Bachelor of Science, Environmental Science- Geology Concentration Long Island University, Southampton College (1985)

## **EXPERIENCE**

IMPACT ENVIRONMENTAL, 2013-Present, Senior Project Manager

- Manage a portfolio of remediation projects in the metropolitan New York City and Long Island regions.
- Responsible for managing Phase I and II Environmental Site
   Assessments, Site characterization and remedial investigations,
   soil vapor investigation, construction and remediation projects in
   commercial and industrial markets for financial intuitions, retail
   gasoline property owners, attorneys, real estate investment and
   development firms, and construction firms.
- Also, manage underground storage tanks removals, State Spill Investigation and Remediation Sites, County and Federal Underground Injection Control Program Sites, New York City Voluntary/Brownfield Cleanup Program Sites, NYSDEC Brownfield Environmental Restoration Program Sites, NYSDEC RCRA Closure Sites, New York City E-Designation Projects.
- Supervise staff of geologists, hydrogeologists, engineers, environmental scientists, and environmental technicians to develop and implement sampling and analysis plans, quality assurance programs, remedial action plans.

## Kleinfelder East, Inc., 2006-2013, Project Manager

- Effectively execute environmental investigation and remediation
  work in support of a multi-million-dollar national contract with
  focus on risk management for activities such as drilling,
  construction associated with remediation system installation,
  demolition, trenching and excavation, underground storage tank
  removal, sheeting/shoring installation, dewatering systems,
  mobile crane work activities and waste management.
- Policy and procedure implementation in accordance with client's operation integrity management system and Loss Prevention System (LPS) requirements.
- Established strong and sustainable relationships with regulatory agency representatives and reached milestones negotiated on behalf of the client with the regulator that have resulted in no further action and site closures.
- Team leader with direct reports responsible for the implementation of health and safety/LPS and technical training, mentorship, goal setting and performance evaluations, and team building

1991-2006 Experience as a Project Manager within the South and Eastern US.

#### **KEY PROJECTS**

- Bill Wolf Petroleum
- · Spartan Petroleum
- Atlantis Management Group
- Gateway Development Group
- · Extell Development Company
- Xenolith Partners
- Lab Corp
- AutoZone

#### **ORGANIZATIONS**

- · National Groundwater Association
- Long Island Geologist Association

- New York City Office of Environmental Remediation – Certified Brownfield Professional (Gold Certification)
- ISO 14001:2004 8 Hour Training Certification
- Loss Prevention System<sup>™</sup> Training
- 40-Hour Hazardous Waste Site Worker Course/Refresher
- · CPR and First Aid certification
- RCRA and DOT Training
- The Ninth Annual Indoor Air Pollution Conference Seminars
- U.S. EPA and ASHRAE Orientation to Indoor Air Quality
- Licensed Profession Geologist (NYS# 000790)



## FIELD OPERATING PROCEDURES

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#### **B.1** FIELD SAMPLING PROCEDURES

## **B.1.1** Sampling Personnel

The activities associated with the remedial investigation will be performed by or under the auspices of a Quality Assurance Officer. The sample staff (samplers) will possess a minimum of a BA Degree in the Earth, Space or Biological Sciences or a BS Degree in Engineering. Samplers will have a minimum of one (1) year experience in environmental/geological fieldwork. Additionally, all samplers will have received mandatory forty-hour Occupational Safety and Health Administration (OSHA) training on working with potentially hazardous materials and appropriate Hazard Communication Program and "Right-To-Know" training.

## **B.1.2** Geophysical Survey

A geophysical survey will be performed over target portions of the planimetric surface of the subject property utilizing a GSSI model SIR-2 ground penetrating radar (GPR) system equipped with a 400MHz antenna. The survey will be performed to identify the presence of any abandoned and/or active underground injection wells associated with the on-site sanitary systems on the Site.

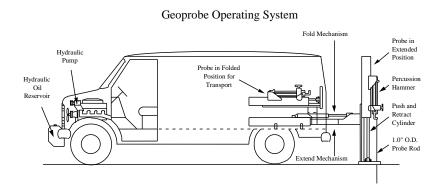
A GPR system consists of a radar control unit, control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 50 KHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the subsurface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit represented as color graphic images for interpolation. This system is capable of transmitting electromagnetic energy in the frequency range of 16MHz to 2000MHz.

A qualified Impact Environmental Consulting, Inc. technician will specify a coordinate system on the planimetric surface of the site to map any subsurface dielectric anomalies detected on the premises. The operator will use knowledge of the subsurface soil composition to calibrate the SIR-2 system to site-specific conditions. Factor settings such as range, gain, number of gain points, and scans per unit, may be modified to yield the most accurate data to describe the subsurface conditions.

Upon finding a dielectric anomaly, a more spatially specific coordinate system may be designed over the area to determine size, shape and orientation. The data collected during the survey will be reviewed by the operator and compared against past experience, technical judgment and prior site knowledge to classify any detected anomalies.

## **B.1.3** Subsurface Vapor Probe and Soil Boring Installation/Soil Sampling

Subsurface probes will be installed using a *Geoprobe* hydraulically powered probing tool. Mechanized, vehicle mounted probe systems apply both static force and hydraulically powered percussion hammers for tool placement (static down forces up to 18,000 pounds combined with percussion hammers of eight horsepower continuous output). Recovery of large sample volumes will be facilitated with a probe-driven sampler. The probe-driven sampler consists of a hollow probe, which opens via a remote-control mechanism at the selected sampling depth in the soil profile to allow soil to enter as it was advanced. Discrete media samples will be secured at the desired depths and contained within a non-reactive transparent plastic sleeve that lined the hollow probe. The plastic sleeves will be removed for subsequent inspection and sample aliquot acquisition.



## **B.1.4** Sample Characterization

A visual inspection of all soil samples recovered for the hydrogeological study will be conducted to classify the sample media. Color classifications will be made in accordance with the Munsell Classification System. Gradation classifications will be made in accordance with the Unified Soil Classification System.

## **B.1.5** Field Headspace Analysis

Headspace analysis will be performed on each of the acquired soil samples utilizing a portable photo ionization detection meter to measure what, if any, hydrocarbon concentrations were present in isolated portions of the secured samples. Calibration of the PID will be conducted prior to sampling using a span gas of known concentration. Headspace analysis will be conducted by partially filling a wide-mouth glass container with sample aliquot and sealing the top with aluminum foil, thereby creating a void. This void is referred to as the sample headspace. To facilitate the detection of any hydrocarbons contained within the headspace, the container will be agitated for a period of thirty (30) seconds. The probe of the vapor analyzer will then be injected through the foil into the headspace to measure the hydrocarbon concentrations present. A Photovac Micro-Tip, photo ionization detection meter (PID) will be the organic vapor analyzer selected for the headspace analysis. A PID utilizes the principle of photo ionization for detection and measurement of hydrocarbon compounds. A PID does not respond to all compounds similarly; rather, each compound has its own response factor relative to its calibration. For this investigation, the PID will be calibrated to isobutylene. Hydrocarbon relative response factors for a PID calibrated to isobutylene are published by the manufacturer.

## **B.1.6** Soil Gas Survey – Photoionization Detector

The concrete slab will be cored at the sampling points using an electric powered core drill. Subsurface probes will be installed using *Geoprobe* manual probing tools. The probes will be equipped with retractable points that allow for soil gas to be measured at discrete depths. Each soil gas sample will be collected from the retractable point utilizing 3/8-inch in diameter disposable tubing. The soil gas will be drawn (purged) for approximately 15 seconds using a portable vacuum pump. The photo ionization detector will then be attached to the tubing to secure a soil gas reading.

## **B.1.7** Soil Gas Survey –Laboratory Analysis

Subsurface probes will be installed using a Geoprobe operating system. The probes will be equipped with a port run tubing system that allows for soil gas to be measured at discrete depths (see diagram below). This soil-gas sampling device uses a vacuum tight seal that isolates the sample acquisition to the specified depth. This device will assure quality control of the multi-depth soil-gas samples and eliminate the potential for inaccurate data. Each soil gas sample will be collected from the port run tubing system-utilizing 3/8-inch in diameter disposable Teflon tubing. The soil gas will be drawn (purged) for approximately 30 seconds using a portable vacuum pump. The soil gas will be pumped into a decontaminated portable pump and collected within a tedlar bag for preservation. Purging and sample collection flow rates will not exceed 0.2 liters per minute.

## Geoprobe Port Run Tubing System



Tracer gas field testing, using helium gas, will be performed on all implants prior to sampling, to verify the integrity of each implant seal and to limit the possibility of sample dilution from surface air. The tracer gas field test will consist of sealing the area surrounding the implant with plastic sheeting and then introduce the tracer gas underneath the sheeting, so that the area where the probe intersects the ground is immersed in the tracer gas. A Model MGD-2002 Multi-Gas Leak Locator or equivalently approved helium detector will be connected to the soil vapor implant and sub-slab vapor implant, in accordance with Section 2.7.5 of the *October 2006, Guidance for Evaluating Soil Vapor Intrusion in the State of New York* NYSDOH guidance document, and tracer gas concentrations in the well will be recorded in the sampling log sheet. This procedure will be duplicated at each implant, prior to sample collection. The laboratory will confirm the field tracer gas tests by first analyzing approximately 85 to 90% of each sample canister for VOC's via USEPA method TO-15 and then use a helium detector to analyze the remaining contents in the Summa Canisters.

The sampling logs with the recorded field tracer gas test measurements and the tracer gas measurements reported by the laboratory will be submitted to NYSDEC with the initial sampling round report. NYSDEC will review the field and laboratory tracer gas test results to determine if the bentonite/cement grout seal

for each implant will require repairs and/or replacement to reduce the infiltration of ambient air and if additional tracer gas field/laboratory testing is required in the subsequent soil vapor sampling round.

## **B.1.8** Permanent Well Installation

Permanent monitoring wells are installed to provide repeated access to groundwater for collecting samples, as well as for obtaining water-level and other field data. Because monitoring wells are used to collect samples, it is important that construction materials not interfere with sample quality either by contributing contaminants or by sorbing contaminants already present. Further, construction materials must be compatible with (i.e., not degraded by) contaminants present in soils or groundwater.

Monitoring wells are potential contaminant migration routes between aquifers or from the surface to the subsurface. Construction procedures and standards must ensure that neither passive nor active introduction of contaminants can occur. Properly installed hydraulic seals and locking well covers reduce the potential for cross-contamination of monitoring wells.

## Equipment needed:

- Drilling or auguring equipment appropriate to site conditions, drilling depth, and other project requirements.
- Drill bits appropriate for the expected soil and rock type(s) to be encountered.
- Sufficient threaded flush-joint riser pipe of an approved material [stainless steel, polyvinyl chloride (PVC)] in convenient lengths. (NOTE: No glues are permitted.)
- Sufficient threaded flush-joint slotted screen of an approved material (stainless steel, PVC) to meet design criteria. (NOTE: No glues are permitted.)
- Properly sized and washed filter pack material (quartz sand) in sufficient volume to meet well design criteria.
- Powdered bentonite.
- Photoionization detector.
- Steel surface casing (if required).
- Steel protective casing with locking cap.
- Tremie pump and pipe.
- Protective clothing, as required.
- Weighted measuring tape.

The following steps will be followed when installing monitor wells:

Advance the borehole to the required depth using a bit or auger flight of a diameter sufficient to
allow for insertion of the tremie pipe when the casing is centered. It is preferred that the
borehole be at least 2 inches in diameter larger than the casing diameter. The borehole should
be drilled slightly deeper than required for the combined length of casing and screen. The final
completion depth should be sounded with a decontaminated, weighted tape before continuance
of well placement.

- 2. Make up the screen for installation. The casing and screen must be decontaminated. Tighten joints.
- 3. Withdraw the drill rods and bit through the auger flights. Check the borehole depth with a weighted surveyor's tape.
- 4. Lower the casing string into the drill casing.
- 5. Install the filter pack. Six inches or more of filter pack material should be spotted at the bottom of the hole, under the screen. Filter pack will be installed to 2 3 feet above the top of the screen.
- 6. Check the depth to the top of the filter pack with a weighted tape.
- 7. Tremie, or for shallow wells (<35 feet), gravity feed bentonite onto the top of the filter pack.
- 8. Pure bentonite grout (or equivalent) will be used as the annular seal, grout will be mechanically mixed with the appropriate amount of water. For shallow wells (<35 feet) granular bentonite may be substituted for grout.
- 9. Tremie the grout into the annulus using a tremie. Slowly withdraw the tremie pipe as the annulus fills. Grout the well to within 1 foot of the surface. Compare actual volume of grout placed with calculated volume. Both should be annotated in the field logbook.
- 10. After installing grout, dismantle and clean tremie equipment.
- 11. Finish the concrete pad so that it slopes away from the wellhead in all directions with a minimum thickness of 4 inches. If weather conditions warrant, cover the concrete until cured. Lock the well cover
- 12. If the well design specified guard posts, dig the holes and set the guard posts in concrete separate from the concrete pad. Posts and concrete must extend to a depth of 2 feet.
- 13. Record the appropriate construction/completion information in the field logbook and on the appropriate monitoring well installation.
- 14. If a form was used for the concrete pad, return to the well site after the concrete has cured for at least 24 hours and remove the form. Backfill around the pad with native soil. Drill a weep hole for protective casing and just above the concrete pad.
- 15. The well identification should be marked on the protective casing and PVC cap. Paint the well cover and posts, if required.

## **B.1.9** Well Development

Monitor wells are developed to remove fines from the filter pack. Wells should not be developed for 24 hours after completion when a bentonite grout is used to seal the annular space. However, wells may be developed before grouting if conditions warrant. Wells are purged immediately before groundwater sampling to remove stagnant water and a sample representative of groundwater conditions. Wells should be sampled within 3 hours of purging (optimum) to 24 hours after purging (maximum, for low recharge conditions).

#### Equipment needed:

- Pump, pump tubing, or bailer and rope or wire line
- Water-level meter
- Temperature, conductivity and pH meters
- Personnel protective equipment as specified in the site-specific HASP
- Decontamination supplies
- Disposal drums, if required
- Photoionization Detector

#### Procedures.

The following steps will be followed when developing wells:

- 1. Put on personnel protective clothing and equipment as specified in the site-specific HASP.
- Open and check the condition of the wellhead, including the condition of the surveyed reference mark, if any. Use photoionization detector at wellhead to determine the presence of VOCs (if applicable).
- 3. Determine the depth to static water level and depth to bottom of the casing.
- 4. Prepare the necessary equipment for developing the well. There are a number of techniques that can be used to develop a well. Some of the more common methods are bailing, surging and purge, and over pumping.
- 5. Continue well development until produced water is clear and free of suspended solids.
- 6. Remove the pump assembly or bailers from the well, decontaminate, and cleanup the site.
- 7. Lock the well cover before leaving. Dispose of produced water as required by the project work plan.

## **B.1.10** Monitoring Well Sampling

Monitoring well sampling is conducted with the goal of collecting data representative of groundwater conditions in the subsurface. The data obtained from a sampling event is typically very important for decision making, as it may be used to identify the presence of constituents of concern in groundwater, monitor the performance of a remedial measure, or evaluate the risks to potential receptors.

A written site specific monitoring or sampling plan is typically available that identifies the frequency of sampling, the wells to be monitored, equipment to be used, required laboratory analytical methods and parameters, sampling procedures, equipment decontamination procedures, sample quality

assurance/quality control (QA/QC) measures and data reporting requirements. Each monitoring or sampling plan will vary from one site to the next and should be reviewed when planning for a monitoring well sampling event.

## Equipment:

The following is a list of standard equipment needed to conduct monitoring well sampling. Additional equipment may be required based on the sampling techniques and site conditions.

- Health and Safety Plan (HASP)
- Field Book
- Personal Protective Equipment
- Decontamination Equipment
- Traffic Control Devices
- Polyethylene Sheeting
- Bailers
- String
- Pumps
- Power Source to Operate Pumps
- Water Level Meter
- Tubing
- Buckets
- Sample Bottles
- Cooler
- Ice
- Bubble Wrap
- Calculator
- Disposable gloves

## Procedures

## Monitoring Well Gauging

Monitoring wells are typically gauged before sampling. Gauging includes measuring the depth to water (and/or non-aqueous phase liquids) and depth to bottom in the monitoring well with an electronic water level meter (WLM) or electronic interface probe (EIP). An EIP is used to gauge a well that contains non-aqueous phase liquids (NAPL-floating product). If wells do not contain NAPL, then a WLM is sufficient. The list of monitoring wells to be gauged should be provided in the monitoring or sampling plan and listed on the PTA. The entire network of monitoring wells should be gauged before sampling begins.

## Sample Bottles

Groundwater samples are collected into laboratory supplied bottles. Bottles are typically ordered from the laboratory in advance of the sampling event. The size, bottle material (glass, plastic), and number of

bottles required for each sample will depend on the constituents being analyzed for and the analytical methods. Bottles delivered from the laboratory may contain a small amount of preservative. The preservative is to remain in the bottle. Overfilling the bottle may result in dilution of the preservative and should be avoided. When sampling for volatile compounds, no air (bubbles) may be present in the sample bottle.

## Sampling Techniques

Many different techniques exist for sampling monitoring wells. The techniques vary depending on the constituents of concern, depth to groundwater, diameter of monitoring well and regulatory requirements. The technique appropriate for a specific site should be identified in the monitoring and sampling plan

## Purging

Many of the sampling techniques include purging the monitoring well prior to sample collection. Purging is indented to remove stagnant water from the monitoring well after which a representative sample of the groundwater from the subsurface can be collected. During purging, three to five volumes of standing water in the well are removed. The volume of water in a monitoring can be calculated using the following equation:

Feet of standing water in well \* Conversion factor = 1 well volume

## Example:

10' \* 0.65 = 6.5 gallons (1 well volume)

Well Diameter (in inches) Conversion Factor

1/2 0.01

1 0.04

2 0.16

3 0.37

4 0.65

6 1.50

Purge water must be managed in accordance with the monitoring or sampling plan and local regulations.

## Field Monitoring

Monitor indicator parameters (main indicator parameter for VOCs is DO) during purging, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh and DO) at three to five-minute intervals. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

## 1. 50 NTUs for turbidity

+/-0.1 for pH

- 2. +/-3% for conductance
- 3. +/-10 mv for redox potential
- 4. +/-10% for DO and turbidity

## Sample Chain of Custody

The chain of custody (COC) form is used to record the inventory of samples to be delivered to the laboratory and document the transfer of custody from the sampler to the laboratory. All samples, including QA/QC samples, to be delivered to the laboratory must be listed on the COC along with requested analytical methods and parameters. The COC is to remain with the samples from the time of collection until receipt at the laboratory.

Sample Handling, Storage and Shipment Samples should be stored in laboratory-supplied coolers immediately after sampling. The cooler must contain ice in order to bring the temperature of the sample to 4 degrees Celsius. Samples must remain on ice until received by the laboratory. Care must be exercised to ensure that bottles do not break during handling of the cooler. Glass-on-glass contact often leads to breakage and should be avoided by wrapping each bottle in bubble wrap material.

Samples are to be delivered to the laboratory in coolers as soon as possible after collection. Each laboratory analytical method has a unique holding time, which is defined as the maximum time between sample collection and analysis by the laboratory. Samples analyzed after the hold time are usually considered invalid. Hold times may vary from one day to 6 months depending on the laboratory analytical methods. Holding time information can be obtained from the laboratory. It is the responsibility of the sampler to confirm that the delivery method will ensure receipt of the samples by the laboratory within the allotted holding time.

Sample delivery options include: shipment by common courier, personal delivery to the laboratory and delivery by the laboratory's courier service. Each laboratory may have a preferred sample delivery process. Coolers must be packed with sufficient amounts of ice and bubble wrap material to ensure the samples will be received by the laboratory intact and at an acceptable temperature. A custody seal, provided by the laboratory, should be placed over the opening between the lid and the base of the cooler, and the seal ID number recorded on the chain of custody form. The custody seal provides a means of alerting the laboratory if the cooler has been opened, and potentially tampered with, between the time it was sealed by the sampler and received by the laboratory. Guidance on cooler packing may be obtained from the laboratory.

#### Decontamination

Decontamination is necessary to avoid cross-contaminating samples. Sampling equipment that is not dedicated to a specific well must be decontaminated before sampling and after each sample is collected. Decontamination procedures may be specific to the site's monitoring or sampling plan. Typical equipment decontamination procedures may include rinses in the following sequence:

- 1) Tap water rinse
- 2) Alconox rinse
- 3) Tap Water Rinse
- 4) Deionized water rinse

When possible, samples should be collected from the least contaminated wells first and progress onto the more contaminated wells in order to reduce chances of sample cross-contamination.

## Documenting a Monitoring Well Sampling Event

Information from the monitoring well sampling event must be documented on a field data form or recorded in the site-specific field book. Information to be recorded includes weather conditions, well integrity issues, well gauging information, purge volumes, sampling equipment and supplies used, sample identifications, sample collection times and the presence of any conditions that may compromise the integrity of the samples.

## **B.1.11** Low Flow Well Purging and Sampling

## Purpose

The purpose of the low flow (low formation stress) purging and sampling procedure is to collect groundwater samples from monitoring wells that are representative of ground water conditions in a particular geological formation. This is accomplished by setting the intake velocity of the sampling pump to a flow rate, which limits drawdown inside the well casing. The placement of the intake of the sampling pump should be midway within the most permeable zone of the formation.

## Equipment

- Pump system (adjustable rate, positive displacement groundwater sampling pump e.g., bladder or centrifugal pump)
- Control box (with or without a built-in compressor)
- Compressed Nitrogen tank (if necessary)
- Indicator parameter monitoring device(s)

- Flow measurement device (Flow cell)
- Personal Protection Equipment (PPE)
- Field Book
- Health and Safety Plan (HASP)
- Tools to access monitoring wells
- Disposable gloves
- Kevlar gloves
- Safety cones
- Sample containers (provided by laboratory)
- Chains of Custody (provided by laboratory)
- Blank or Pre-printed labels
- Glassware with appropriate preservative (provided by the laboratory)
- Ice
- Calculator
- Adsorbent pads
- Electronic interface probe
- Decontamination equipment
- String
- Appropriate size bailers
- Tubing (preferably Teflon for organics)

## Procedure

Remove the gripper cap at all well locations and allow the water table to equilibrate, take care to secure all wells by closing the flush mount covers. Start sampling at the well-known or believed to have the least contamination and systematically to the most contaminated well, remembering to conduct proper decon procedure. During gauging and sampling activities equipment should not come into direct contact with the ground surface, plastic sheeting may be utilized as a clean and disposable working surface.

Slowly lower the pump to the depth specified for that well, the pump intake should never be set within two feet of the bottom of any well. This prevents disturbance and resuspension of any sediment. Record the depth of the pump intake. Re-measure the water level and begin purging, keeping the purge rate within 200-500 millimeters per minute (ml/min). Water level should be measured and recorded at three to five-minute intervals. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less is desired). Monitor indicator parameters (main indicator parameter for VOCs is DO) during purging, monitor and record the field indicator parameters (turbidity, temperature,

specific conductance, pH, Eh and DO) at three to five-minute intervals. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

- 1. 50 NTUs for turbidity
- 2. +/-0.1 for pH
- 3. +/-3% for conductance
- 4. +/-10 mv for redox potential
- 5. +/-10% for DO

Collect sample from dedicated or disposable tubing. Remove any non-dedicated equipment from the well. Secure all wells. Fill out the chain of custody. At the end of the sampling day, coolers will be taped shut with the custodian's initials placed on custody seals at points of entry. Samples will be shipped via lab courier to the contract laboratory for morning delivery, picked up by courier or delivered directly to the laboratory by the field personnel at the end of the sampling day.

Contact with the laboratory will be made within 24 hours after each sampling event to ensure that samples arrived safely and with proper integrity preserved.

## **B.1.12** Grouting Bore Holes

Subsequent to the completion of each soil and groundwater probe installed during the remedial investigation, bottom-up grouting of the borehole will be conducted to grade. The grouting system was designed specifically for direct push applications. With powerful reciprocating (piston) pumps, the Geoprobe Grout Machines will deliver standard ASTM grout materials through 1.25-inch diameter Geoprobe probe rods or through 3/8-inch (1/4-inch inside diameter) polyethylene tubing. The pump is rated at 1000 psi with flow rates from 0.9 to 2.3 gpm.

## **B.1.13** Emerging Contaminant PFAS

The NYSDEC requires analysis for Per- and Polyfluoroalkyl Substances (PFAS) for new remedial program Sites as part of the investigation of potentially affected media, including soil, groundwater, surface water and sediment as an addition to the standard TAL/TCL sampling. Soil vapor sampling for PFAS is not required.

The following is the list of the 21 PFAS compounds identified by the NYSDEC for investigation:

- Perfluorobutanoic Acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid (PFOA)
- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluoro-n-tridecanoic acid
- Perfluorotetradecanoic acid
- Perfluorobutane sulfonic acid
- Perfluorohexane sulfonic acid
- Perfluoroheptane sulfonic acid
- Perfluorooctane sulfonic acid (PFOS)
- Perfluorodecane sulfonic acid
- 6:2 Fluorotelomersulfonic acid
- 8:2 Fluorotelomersulfonic acid
- Perfluorooctanesulfonamide
- N-methyl perfluoro-1-octanesulfonamidoacetic acid
- N-ethyl perfluoro-1-octanesulfonamidoacetic acid

## **PFAS Sampling Protocol:**

Since the probability of false positives is relatively high during PFAS sample collection, due to the potential for many sources of cross-contamination combined with the low laboratory detection limits, guidance is needed for staff who will perform subsurface investigation activities (i.e., soil borings, monitoring well installation) and for staff collecting and/or handling PFAS environmental samples.

There are many products/materials/supplies that contain PFAS which pose a greater risk for introducing PFAS contamination into a sample during the sample collection process. These sources include the water used during drilling or decontamination, materials used within the sampling environment, sampling equipment, field clothing and personal protective equipment, sun and biological protection products, personal hygiene and personal care products, food packaging and the environment itself.

## Field Clothing and Personal Protective Equipment (PPE)

Due to the extensive use of PFAS in many industries and products, clothing and PPE are likely to contain PFAS. Personnel completing field investigation work that will include the collection of samples for PFAS

analysis will need to address the physical, chemical and biological hazards associated with the Site. Field planning is essential to mitigate the potential for PFAS cross-contamination and to maintain personal safety.

- No clothing or boots with protective coatings can be worn (e.g., waterproof, water-repellent, fire-repellant or stain-resistant clothing or footwear). No Gore-Tex® or Tyvek material clothing/boots.
- Clothing worn during the collection of samples for PFAS analysis should be made of natural fibers (preferable cotton) and must have been previously washed a minimum of 5 times (i.e. no new clothing), without fabric softener and not with other clothing that may contain coatings.
- Use disposable, coating-free polyethylene coveralls and boot as applicable.
- Do not use personal care products on the day of sample collection:
  - Use PFAS-free soap and shampoo when scheduled for sample collection.
  - Limit toothpaste, mouthwash and dental floss to fluoride free options.
  - Do not use lotions, moisturizers, cosmetics, sunscreen or insect repellents prior to sampling.
- Use disposable, nitrile gloves.
- Do not use aluminum foil, prepackaged food, fast food wrappers or containers.

## Field Sampling Equipment/Materials:

Because of the potential presence of PFAS in equipment typically used for drilling and to collect soil, groundwater, surface water, sediment, and drinking water samples, as well as the need for very low reporting limits, special handling and care must be taken when collecting samples for PFAS analysis to avoid sample contamination. The following guidance should be considered when using field sampling equipment.

- A screening of the equipment and materials that will be used during field sampling activities must be completed to identify equipment/materials that may be potential PFAS sources.
- Identify and use a PFAS free water source for drilling and decontamination of equipment.
- Use high density polyethylene [HDPE] water holding tanks.
- Use HDPE or silicone tubing materials.
- Use HDPE or polypropylene containers with HDPE or polypropylene caps.
- Use regular ice and Ziploc bags where there is no direct contact with the sample.
- Use loose plain paper, metal clipboard, ballpoint pens.
- When feasible, utilize single-use, disposable polyethylene or silicone materials (tubing, bailers, etc.) for monitoring well purging and sampling.

- Consumable core liners and catchers must be PVC.
- When using positive displacement/submersible pumps, familiarize yourself with the sampling pump/accessory equipment specifications to confirm that the device components do not contain Teflon® or Polytetrafluoroethylene (PTFE). Do not use pumps and tubing that contain Teflon™ and other fluoropolymer-containing materials.
- Do not use waterproof/treated paper or field books, plastic clipboards, water proof markers, Post-its and other adhesive paper products.
- Do not use passive diffusion bags for groundwater sampling.
- Do not use low density polyethylene (LDPE) sampling equipment/materials.
- Do not use drill casing thread lubricants that contain PFAS. Verify with supplier.
- Do not use LDPE or glass bottles with Teflon<sup>™</sup>-lined caps.
- Do not use chemical ice packs (i.e., Blue ice®).
- Do not handle any packaged food or drinks, aluminum foil, adhesive labels, etc. at or around sampling site.

## **Equipment Prep and Decontamination Procedures**

The following procedure should be used to decontaminate HPDE, polypropylene or stainless-steel equipment used to collect samples for PFAS analysis. Because of the extremely low detection and reporting levels required for PFAS analysis, precaution should be taken to ensure decontamination materials (e.g., soap, tap water, deionized water) are not contaminated with PFAS prior to use. Traditional best practice techniques and procedures shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS. Sample containers will be new and used only once for each sample and disposable equipment (e.g., gloves, tubing, etc.) will not be reused, therefore; these items will not require decontamination. All non-dedicated or non-disposable sampling equipment (i.e., the stainless-steel compositing vessel(s), flow-through cell, etc.) will be decontaminated between sample locations. The following guidance should be considered when preparing equipment and decontamination of equipment.

- An equipment decontamination area with a decon pad should be set up in the field to accommodate the sampling and drilling equipment.
- General Sampling Equipment Decon:
  - o Rinse equipment with PFAS free municipal PFAS free water to remove solids.
  - Use a polyethylene or poly vinyl chloride (PVC) brush and a low-phosphate lab detergent
     (i.e., Alconox) to scrub the equipment to remove residue and particulates.
  - o Triple rinse clean equipment with <u>PFAS Free</u> deionized water and let air dry.

- Decontaminate sampling equipment after sampling at each location, or at the end of the field work day.
- The decontamination water should be changed between equipment cleanings.
- Clean, decontaminated equipment will be placed on clean polyethylene plastic or HPDE sheets to air dry. Direct contact with the ground will be avoided.

## Drilling Equipment Decon:

- Drilling equipment, including rig, tooling, augers, bits, samplers, tremie pipes, etc. will be cleaned with a hot water pressure washer within a decon pad constructed of on clean polyethylene plastic or HPDE sheets and barriers to contain liquid generated.
- The clean drilling equipment will be rinsed with <u>PFAS Free</u> deionized water and let air dry on clean polyethylene plastic or HPDE sheets.
- Drilling equipment must be cleaned before beginning work (when applicable), inbetween/following completion of borings, wells, and at the end of the field work day.
- Tools, drill rods, and augers will be placed on polyethylene plastic or HPDE sheets following pressure washing. Direct contact with the ground will be avoided.
- Decon water will be temporarily collected in 55-gallon drums and transported to a waste accumulation area for later disposal.

## • Well Development Equipment Decon:

- o Prior to well development, non-dedicated equipment (e.g., bailers, PFOS-free pumps, etc.) will be washed with potable water and a PFC/phosphate-free detergent (i.e., Alconox®).
- The sampling equipment will then be rinsed with potable water followed by a triple rinse with PFAS Free deionized water.
- The clean/decontaminated equipment will be placed on polyethylene plastic or HPDE sheets to air dry. At no time, will washed equipment be placed directly on the ground.
- Decon water will be temporarily collected in 55-gallon drums and transported to a waste accumulation area for later disposal.

## Sample Collection

PFAS are ubiquitous in consumer products and the pervasive presence of these chemicals coupled with very sensitive analytical methods makes contamination of samples both in the lab and the field a significant concern from sources extraneous of the environmental media being sampled. The following guidance should be considered when undertaking collection of samples for PFAS analysis.

Transport of sample collection supplies and equipment have the potential to come into contact
with carpets and fabric in vehicles which have likely been treated with stain-resistant/water
proofing containing PFAS. Steps should be taken to minimize this contact by packaging supplies

and equipment in the designated coolers and/or using polyethylene plastic or HPDE sheets as a barrier.

- Sample container labels should be prepared to the extent possible using a ball-point pen only before arrival at the sampling site and completed at the Site with a ball point pen; do not use sharpie or other permanent markers. No waterproof logbooks or plastic clipboards are to be used.
- Keep materials/equipment that may contain PFAS away from the sampling area and avoid physical contact with anything likely to contain PFAS (e.g., food, clothing, personal care products, etc.) during the sample collection process.
- Maintain an inventory of items used/maintained in the sampling area.
- If other sampling is to be performed, ALWAYS collect PFAS samples first. This avoids contact with any other type of sample container, bottles or package materials
- All sample containers use for PFAS sampling must come from the laboratory that will also be
  performing the PFAS analysis. Recommended sampling containers should be HDPE bottles fitted
  with unlined (no Teflon) polyethylene screw caps.
- Sample containers must be stored in a PFAS free container prior to sampling.
- For all environmental media, hands should be washed well before sampling.
- Wear disposable, powder free nitrile gloves to handle sampling equipment and sample containers. Clean nitrile gloves should be used when collecting the sample.
- Take precautions not to touch any surfaces prior to sample collection.
- As with all other samples, do not place the sample bottle cap on any surface when collecting the sample, and avoid all contact with the inside of the sample bottle or its cap.
- Sample directly into the provided HDPE bottle seal with cap. Place the bottles into individual sealed plastic bag (e.g. Ziploc®) separate from other samples in a clean, dedicated cooler for PFAS samples only.
- Use bagged ice (PFAS free) in the dedicated PFAS sample cooler; NO chemical ice packs in this
  cooler.
- No samples collected for other parameters can be stored with the PFAS samples.

## PFAS Analysis and Reporting

The designated analytical laboratory must provide a full category B deliverable, and a DUSR will be prepared by an independent 3<sup>rd</sup> party data validator. QA/QC samples will be collected as required in DER-10, Section 2.3(c).

Modified EPA Method 537.1 is the preferred method to use for environmental samples due to its ability to achieve very low detection limits. Reporting limits for PFAS in groundwater and soil are to be 2 ng/L (ppt) and 0.5 ug/kg (ppb), respectively. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve these reporting limits for the entire list of 21 PFAS, site specific decisions will need to be made by the NYSDEC project manager in consultation with the NYSDEC remedial program chemist. Note: Reporting limits for PFOA and PFOS in groundwater should not exceed 2 ng/L.

The NYSDEC has developed a PFAS Analyte List for remedial programs. If lab and/or matrix specific issues are encountered for any compounds, the NYSDEC PM, in consul with the NYSDEC Remedial Program Chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each Site.

## Summary of Prohibited and Acceptable Items for PFAS Sampling

| Prohibited   | Acceptable  |  |  |  |  |
|--|---|--|--|--|--|
| Field Equipment  |   |  |  |  |  |
| Teflon/Silicone containing materials   | HDPE, stainless steel, polypropylene materials  |  |  |  |  |
| LDPE materials   | Acetate liners  |  |  |  |  |
| Waterproof field books/paper/bottle labels   | Loose non-waterproof paper, and non-waterproof sample labels  |  |  |  |  |
| Plastic Clipboards/binders/hard cover notebooks  | Aluminum field clipboards or with Masonite  |  |  |  |  |
| Waterproof markers/sharpies  | Pens  |  |  |  |  |
| Post-it-notes  | Wet-ice   |  |  |  |  |
| Chemical ice packs   |   |  |  |  |  |
| Field clothi   | ng and PPE  |  |  |  |  |
| New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing treated with Gore-Tex                              | Well laundered clothing made of natural fibers (preferably cotton)  |  |  |  |  |
| Clothing laundered with fabric softener  | No fabric softener  |  |  |  |  |
| Boots containing Gore-Tex or treated with water resistant spray  | Boots made with polyurethane and PVC  |  |  |  |  |
| Tyvek  | Laundered cotton clothing   |  |  |  |  |
| Cosmetics, moisturizers, hand cream etc. as part of personal cleaning/showering routine, or non-natural toxic containing sunscreens and insecticides | Natural, non-toxic, and natural sunscreens/insect repellents.   |  |  |  |  |
| Sample C   | Containers  |  |  |  |  |
| LDPE or glass containers   | HDPE or polypropylene   |  |  |  |  |
| Teflon-lined caps  | Unlined polypropylene caps  |  |  |  |  |
| Rain e   | events  |  |  |  |  |
| Waterproof or resistant rain gear  | Wet weather gear made from polyurethane and PVC only  |  |  |  |  |
| Equipment Decontamination  |   |  |  |  |  |
| Decon 90<br>Liquinox   | Alconox   |  |  |  |  |
| Water from onsite well   | 7 <sup>th</sup> Generation Free & Clear Dish Soap   |  |  |  |  |
| Water from onsite well  Food considerations  |   |  |  |  |  |
| All food and drink with the exceptions of those noted on the right   | Bottled water with hydration fluids (i.e. Gatorade and Powerade) to be brought and consumed only in staging areas |  |  |  |  |
| Vehicle Considerations   |   |  |  |  |  |
| Vehicle fabrics, carpets and mats may contain PFAAs  | Avoid utilizing areas inside vehicles as sample/staging areas   |  |  |  |  |

## **B.1.14** Emerging Contaminant 1,4-Dioxane

The NYSDEC requires analysis for 1-4 Dioxane for new remedial program Sites as part of the investigation of potentially affected media, including soil, groundwater, surface water and sediment as an addition to the standard TAL/TCL sampling. Soil vapor sampling for 1,4-Dioxane is not required. 1,4-Dioxane is used as a stabilizer and inhibitor in chlorinated solvents, and used for a wide variety of other industrial processes. It is present in adhesives, sealants, cosmetics, pharmaceuticals, rubber chemicals and surface coatings.

The NYSDEC reporting limit for 1,4-dioxane in groundwater should be no higher than 0.35  $\mu$ g/L (ppb) and no higher than 0.1 mg/kg (ppm) in soil. Materials used in environmental sampling can be a source of 1,4-dioxane contamination. 1,4-Dioxane also might be present in detergents used to decontaminate environmental sampling equipment.

Because of the potential presence of 1,4-dioxane in equipment typically used to collect environmental samples, as well as the need for very low reporting limits, special handling and care must be taken when collecting samples to avoid sample contamination. The best practice techniques and procedures provided in Section B.1.13 entitled *Emerging Contaminant PFAS* should be implemented when collecting samples for 1,4-dioxane analysis.

Although ELAP offers certification for both EPA Method 8260 SIM and EPA Method 8270 SIM in waters, the NYSDEC DER is advising the use of Method 8270 SIM because it provides a more robust extraction procedure, uses a larger sample volume, and is less vulnerable to interference from chlorinated solvents. The analysis currently performed for SVOCs in soil is adequate for evaluation of 1,4-dioxane in soil, which already has an established SCO.

#### **B.2 QA/QC FIELD PROCEDURES**

#### **B.2.1** Decontamination Procedures

Prior to arrival on the Site and between sample locations, the probes will be decontaminated by steam cleaning, Alconox wash, and rinsing with distilled water. This will be followed by air drying as per project requirements. All sampling apparatus will be dedicated or disposable. A clean, new liner will be used for each sample. Parts will be inspected for wear and damage before each use.

#### **B.2.2** Field Blanks

A field blank is a sample of analyte-free water transferred, at the project site, into an appropriate container for the purpose of distinguishing ambient air contamination from in-situ sample contamination. Field blanks are used to indicate potential cross contamination from sampling equipment as quality control of decontamination procedures. With regards to field sampling, one field blank will be collected for every work day. The procedures for obtaining a field blank sample are as follows:

- Collect two sets of sample vessels. One vessel shall contain analyte free water and the other is empty.
- Run the analyte free water through the decontaminated sampling equipment into the empty vessel.
   Analye the water of this collecting vessel for target analytes.

#### **B.2.3** Trip Blanks

A trip blank is used to identify the presence of volatile compound contamination attributable to transfer across a sample container septum during shipping and storage of samples. A trip blank is a sample of analyte-free matrix that is transported from the laboratory to the sampling site with the sample containers. The trip blank is stored on-site with the sample containers and field samples and then transported back to the laboratory with the samples for analysis. The trip blank is received and processed as a sample by the laboratory. One trip blank shall be submitted per pickup from laboratory personnel.

#### **B.2.4** Duplicate Samples

Duplicate sample collection will apply to groundwater, soil, soil vapor and ambient air samples collected at this Site. A duplicate (replicate) sample is collected to control the general sampling methodology that is being employed. This sample ensures that a representative sample is being collected. Duplicate samples may also be submitted to verify the accuracy of analytical results.

#### **B.2.5** Matrix Spike/Matrix Spike Duplicate Samples

Matrix Spike/Matrix Spike Duplicate sample collection will apply to groundwater samples collected at this Site. A Matrix Spike and Spike Duplicate (MS/MSD) sample(s) are representative but randomly chosen client samples that have known concentrations of analytes of interest added to the samples prior to sample preparation and analysis. They are processed along with the same un-spiked sample. The purpose of the MS/MSD is to document the accuracy and precision of the method for that specific sample.

#### **B.3 Record Keeping and Documentation Procedures**

#### **B.3.1** Sampling Documentation

The sample team or individual performing an activity shall be required to keep a weatherproof Site field notebook. The Site field notebook will be used on-site to record notes pertaining to the field sampling plan. Field notebooks are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during projects and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. In a legal proceeding, notes, if referred to, are subject to cross-examination and are admissible as evidence. The field notebook entries should be factual, detailed, and objective. All entries are to be signed and dated. All members of the field investigation team are to use this notebook, which shall be kept as a permanent record. The field notebook shall be filled out at the location of sample collection immediately after sampling. It shall contain sample descriptions including: sample number, sample collection time, sample location, sample description, sampling method used, daily weather conditions, field measurements, name of sampler, and other site-specific observations. The field notebook shall contain any deviations from the protocol contained herein, visitor's names, and community contacts made during sampling, and geologic and other site-specific information that may be noteworthy.

#### **B.3.2** Sample Containers and Analytical Requirements

All sample vessels will be "level A" certified decontaminated containers supplied by a New York State Certified Commercial Laboratory. Samples analyzed for hydrocarbons will be placed in containers with Teflon lined caps. All samples will be preserved by cooling them to a temperature of approximately four degrees Celsius. If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur. Necessary preservatives will be placed in the sample bottles by the laboratory. The sample bottles will be handled carefully so that preservatives and glassware are not inadvertently spilled. All liquid samples will be put into 40-ml glass vials with Teflon liners.

#### **B.3.3** Sample Tracking System

In order to provide for proper identification in the field, and proper tracking in the laboratory, all samples must be labeled clear and in a consistent fashion using the procedures and protocols described below and with the following subsections.

Sample labels will be waterproof and have a pre-assigned, unique number that is indelible.

Field personnel must maintain a field notebook. This notebook must be water resistant with sequentially numbered pages. Field activities shall be sequentially recorded at a later time. The notebook, along with the chain of custody form, must contain sufficient information to allow reconstruction of the sample collection and handling procedure at a later time. Each sample shall have a corresponding notebook entry that includes:

- Sample ID number
- Well location and number
- Date and time
- Analysis for which sample was collected
- Additional comments as necessary
- Sampler's name

Each sample must have a corresponding notebook entry on a chain-of-custody form. The manifest entry for sampling at any one location is to be completed before sampling is initiated by the same sampling team at any other location. In cases where the samples leave the immediate control of the sampling team, the samples must be sealed.

#### **B.3.4** Sample Identification System

Each sample collected shall be designated by an alphanumeric code that shall identify the type of sampling location, the specific location, the matrix sampled, and a specific sample designation. Site specific procedures are described below.

Sample identifications shall contain a sequential code consisting of three segments. The first segment shall designate the project number. The second segment shall identify the location type. Location types shall be identified by a two-letter code. For example, MW will be used for monitoring well and GP for geoprobe. The third segment shall identify the specific sample location. The specific sampling location shall be identified using a three-digit number.

The fourth segment shall identify the matrix type and sample designation or identifier that identifies the sample depth, the sample event number, or other designation depending on the sample type. The matrix type shall be designated by a two-letter code. For example: GW will be used for groundwater. The sample identifier shall be represented by a two digit numeric code. Sampling events or rounds, such as for groundwater sampling shall be numbered in sequence beginning with "01" that corresponds to the round of sampling.

The following shall be a general guide for sample identification:

| First Segment | Second Segment | Third Segment | Fourth Segment           |
|---------------|----------------|---------------|--------------------------|
| NNN           | AA             | NNN           | AANN                     |
| Project #     | Location Type  | Specific Type | Matrix Sample Identifier |
|               |                |               |                          |
| 455           | GP             | 1             | GW01                     |

Symbol Definitions: Location Type: Matrix Type:

A = Alphabetic MW = Monitoring Well S = Soil

N = Numeric GP = Geoprobe GW = Groundwater

#### **B.3.5** Sample Transfer

Samples shall be containerized and immediately transferred within a cooler to the mobile laboratory with minimal disturbance. Chain-of-custody forms will be completed at the time of sample collection and will accompany the samples inside a cooler for transfer from sample team to mobile laboratory representatives.

#### **B.3.6** Chain-of-Custody Protocol

The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. Sample custody for samples collected during the investigation will be maintained by the field personnel collecting the samples. Field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are transferred to the mobile laboratory.

| Appendix E: Alpha Analytical | Parameter Summary Tables |  |
|------------------------------|--------------------------|--|
|                              |                          |  |
|                              |                          |  |
|                              |                          |  |
|                              |                          |  |
|                              |                          |  |



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#### TCL Volatiles - EPA 8260C (WATER)

Holding Time: 14 days
Container/Sample Preservation: 3 - Vial HCl preserved

|                            |             |     |        |       | LCS      |         | MS       |        | Duplicate | Surrogate | 1 |
|----------------------------|-------------|-----|--------|-------|----------|---------|----------|--------|-----------|-----------|---|
| Analyte                    | CAS #       | RL  | MDL    | Units | Criteria | LCS RPD | Criteria | MS RPD | RPD       | Criteria  |   |
| Methylene chloride         | 75-09-2     | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        | 0.100.10  |   |
| 1.1-Dichloroethane         | 75-34-3     | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Chloroform                 | 67-66-3     | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Carbon tetrachloride       | 56-23-5     | 0.5 | 0.134  | ug/l  | 63-132   | 20      | 63-132   | 20     | 20        |           |   |
| 1,2-Dichloropropane        | 78-87-5     | 1   | 0.133  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Dibromochloromethane       | 124-48-1    | 0.5 | 0.149  | ug/l  | 63-130   | 20      | 63-130   | 20     | 20        |           |   |
| 1,1,2-Trichloroethane      | 79-00-5     | 1.5 | 0.5    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Tetrachloroethene          | 127-18-4    | 0.5 | 0.181  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Chlorobenzene              | 108-90-7    | 2.5 | 0.7    | ug/l  | 75-130   | 20      | 75-130   | 20     | 20        |           |   |
| Trichlorofluoromethane     | 75-69-4     | 2.5 | 0.7    | ug/l  | 62-150   | 20      | 62-150   | 20     | 20        |           |   |
| 1,2-Dichloroethane         | 107-06-2    | 0.5 | 0.132  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,1,1-Trichloroethane      | 71-55-6     | 2.5 | 0.7    | ug/l  | 67-130   | 20      | 67-130   | 20     | 20        |           |   |
| Bromodichloromethane       | 75-27-4     | 0.5 | 0.192  | ug/l  | 67-130   | 20      | 67-130   | 20     | 20        |           |   |
| trans-1,3-Dichloropropene  | 10061-02-6  | 0.5 | 0.164  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| cis-1,3-Dichloropropene    | 10061-01-5  | 0.5 | 0.144  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,3-Dichloropropene, Total | 542-75-6    | 0.5 | 0.144  | ug/l  |          |         |          | 20     | 20        |           |   |
| 1,1-Dichloropropene        | 563-58-6    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Bromoform                  | 75-25-2     | 2   | 0.65   | ug/l  | 54-136   | 20      | 54-136   | 20     | 20        |           |   |
| 1,1,2,2-Tetrachloroethane  | 79-34-5     | 0.5 | 0.144  | ug/l  | 67-130   | 20      | 67-130   | 20     | 20        |           |   |
| Benzene                    | 71-43-2     | 0.5 | 0.159  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Toluene                    | 108-88-3    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Ethylbenzene               | 100-41-4    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Chloromethane              | 74-87-3     | 2.5 | 0.7    | ug/l  | 64-130   | 20      | 64-130   | 20     | 20        |           |   |
| Bromomethane               | 74-83-9     | 2.5 | 0.7    | ug/l  | 39-139   | 20      | 39-139   | 20     | 20        |           |   |
| Vinyl chloride             | 75-01-4     | 1   | 0.0699 | ug/l  | 55-140   | 20      | 55-140   | 20     | 20        |           |   |
| Chloroethane               | 75-00-3     | 2.5 | 0.7    | ug/l  | 55-138   | 20      | 55-138   | 20     | 20        |           |   |
| 1,1-Dichloroethene         | 75-35-4     | 0.5 | 0.142  | ug/l  | 61-145   | 20      | 61-145   | 20     | 20        |           |   |
| trans-1,2-Dichloroethene   | 156-60-5    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Trichloroethene            | 79-01-6     | 0.5 | 0.175  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,2-Dichlorobenzene        | 95-50-1     | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,3-Dichlorobenzene        | 541-73-1    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,4-Dichlorobenzene        | 106-46-7    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Methyl tert butyl ether    | 1634-04-4   | 2.5 | 0.7    | ug/l  | 63-130   | 20      | 63-130   | 20     | 20        |           |   |
| p/m-Xylene                 | 179601-23-1 | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| o-Xylene                   | 95-47-6     | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Xylene (Total)             | 1330-20-7   | 2.5 | 0.7    | ug/l  |          |         |          | 20     | 20        |           |   |
| cis-1,2-Dichloroethene     | 156-59-2    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,2-Dichloroethene (total) | 540-59-0    | 2.5 | 0.7    | ug/l  |          |         |          | 20     | 20        |           |   |
| Dibromomethane             | 74-95-3     | 5   | 1      | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| 1,2,3-Trichloropropane     | 96-18-4     | 2.5 | 0.7    | ug/l  | 64-130   | 20      | 64-130   | 20     | 20        |           |   |
| Acrylonitrile              | 107-13-1    | 5   | 1.5    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |
| Styrene                    | 100-42-5    | 2.5 | 0.7    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |   |







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#### TCL Volatiles - EPA 8260C (WATER)

Holding Time: 14 days
Container/Sample Preservation: 3 - Vial HCl preserved

|                             |            |     |      |       | LCS      |         | MS       |        | Duplicate | Surrogate |  |
|-----------------------------|------------|-----|------|-------|----------|---------|----------|--------|-----------|-----------|--|
| Analyte                     | CAS #      | RL  | MDL  | Units | Criteria | LCS RPD | Criteria | MS RPD | RPD       | Criteria  |  |
| Dichlorodifluoromethane     | 75-71-8    | 5   | 1    | ug/l  | 36-147   | 20      | 36-147   | 20     | 20        |           |  |
| Acetone                     | 67-64-1    | 5   | 1.46 | ug/l  | 58-148   | 20      | 58-148   | 20     | 20        |           |  |
| Carbon disulfide            | 75-15-0    | 5   | 1    | ug/l  | 51-130   | 20      | 51-130   | 20     | 20        |           |  |
| 2-Butanone                  | 78-93-3    | 5   | 1.94 | ug/l  | 63-138   | 20      | 63-138   | 20     | 20        |           |  |
| Vinyl acetate               | 108-05-4   | 5   | 1    | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 4-Methyl-2-pentanone        | 108-10-1   | 5   | 1    | ug/l  | 59-130   | 20      | 59-130   | 20     | 20        |           |  |
| 2-Hexanone                  | 591-78-6   | 5   | 1    | ug/l  | 57-130   | 20      | 57-130   | 20     | 20        |           |  |
| Bromochloromethane          | 74-97-5    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 2,2-Dichloropropane         | 594-20-7   | 2.5 | 0.7  | ug/l  | 63-133   | 20      | 63-133   | 20     | 20        |           |  |
| 1,2-Dibromoethane           | 106-93-4   | 2   | 0.65 | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,3-Dichloropropane         | 142-28-9   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,1,1,2-Tetrachloroethane   | 630-20-6   | 2.5 | 0.7  | ug/l  | 64-130   | 20      | 64-130   | 20     | 20        |           |  |
| Bromobenzene                | 108-86-1   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| n-Butylbenzene              | 104-51-8   | 2.5 | 0.7  | ug/l  | 53-136   | 20      | 53-136   | 20     | 20        |           |  |
| sec-Butylbenzene            | 135-98-8   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| tert-Butylbenzene           | 98-06-6    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| o-Chlorotoluene             | 95-49-8    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| p-Chlorotoluene             | 106-43-4   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,2-Dibromo-3-chloropropane | 96-12-8    | 2.5 | 0.7  | ug/l  | 41-144   | 20      | 41-144   | 20     | 20        |           |  |
| Hexachlorobutadiene         | 87-68-3    | 2.5 | 0.7  | ug/l  | 63-130   | 20      | 63-130   | 20     | 20        |           |  |
| Isopropylbenzene            | 98-82-8    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| p-Isopropyltoluene          | 99-87-6    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| Naphthalene                 | 91-20-3    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| n-Propylbenzene             | 103-65-1   | 2.5 | 0.7  | ug/l  | 69-130   | 20      | 69-130   | 20     | 20        |           |  |
| 1,2,3-Trichlorobenzene      | 87-61-6    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,2,4-Trichlorobenzene      | 120-82-1   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,3,5-Trimethylbenzene      | 108-67-8   | 2.5 | 0.7  | ug/l  | 64-130   | 20      | 64-130   | 20     | 20        |           |  |
| 1,2,4-Trimethylbenzene      | 95-63-6    | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,4-Dioxane                 | 123-91-1   | 250 | 41.1 | ug/l  | 56-162   | 20      | 56-162   | 20     | 20        |           |  |
| 1,4-Diethylbenzene          | 105-05-5   | 2   | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 4-Ethyltoluene              | 622-96-8   | 2   | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,2,4,5-Tetramethylbenzene  | 95-93-2    | 2   | 0.65 | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| Ethyl ether                 | 60-29-7    | 2.5 | 0.7  | ug/l  | 59-134   | 20      | 59-134   | 20     | 20        |           |  |
| trans-1,4-Dichloro-2-butene | 110-57-6   | 2.5 | 0.7  | ug/l  | 70-130   | 20      | 70-130   | 20     | 20        |           |  |
| 1,2-Dichloroethane-d4       | 17060-07-0 |     |      | j.,   |          |         |          |        |           | 70-130    |  |
| Toluene-d8                  | 2037-26-5  |     |      |       |          |         |          |        |           | 70-130    |  |
| 4-Bromofluorobenzene        | 460-00-4   |     |      |       | 1        |         |          |        |           | 70-130    |  |
| Dibromofluoromethane        | 1868-53-7  |     |      |       |          |         |          |        |           | 70-130    |  |
|                             |            |     |      |       |          |         |          |        |           |           |  |
|                             |            |     |      |       |          |         |          |        |           |           |  |
|                             |            |     |      |       |          |         |          |        |           |           |  |
|                             |            |     |      |       |          |         |          |        |           |           |  |







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#### TCL Volatiles - EPA 8260C/5035 High&Low (SOIL)

|                            |             |     |       |       | LCS      |         | MS       |        | Duplicate | Surrogate |  |
|----------------------------|-------------|-----|-------|-------|----------|---------|----------|--------|-----------|-----------|--|
| Analyte                    | CAS #       | RL  | MDL   | Units | Criteria | LCS RPD | Criteria | MS RPD | RPD       | Criteria  |  |
| Methylene chloride         | 75-09-2     | 5   | 2.29  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1.1-Dichloroethane         | 75-34-3     | 1   | 0.145 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Chloroform                 | 67-66-3     | 1.5 | 0.14  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Carbon tetrachloride       | 56-23-5     | 1   | 0.23  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,2-Dichloropropane        | 78-87-5     | 1   | 0.125 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Dibromochloromethane       | 124-48-1    | 1   | 0.14  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,1,2-Trichloroethane      | 79-00-5     | 1   | 0.267 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Tetrachloroethene          | 127-18-4    | 0.5 | 0.196 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Chlorobenzene              | 108-90-7    | 0.5 | 0.127 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Trichlorofluoromethane     | 75-69-4     | 4   | 0.695 | ug/kg | 70-139   | 30      | 70-139   | 30     | 30        |           |  |
| 1,2-Dichloroethane         | 107-06-2    | 1   | 0.257 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,1,1-Trichloroethane      | 71-55-6     | 0.5 | 0.167 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Bromodichloromethane       | 75-27-4     | 0.5 | 0.109 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| trans-1,3-Dichloropropene  | 10061-02-6  | 1   | 0.273 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| cis-1,3-Dichloropropene    | 10061-01-5  | 0.5 | 0.158 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,3-Dichloropropene, Total | 542-75-6    | 0.5 | 0.158 | ug/kg |          |         |          | 30     | 30        |           |  |
| 1,1-Dichloropropene        | 563-58-6    | 0.5 | 0.159 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Bromoform                  | 75-25-2     | 4   | 0.246 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,1,2,2-Tetrachloroethane  | 79-34-5     | 0.5 | 0.166 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Benzene                    | 71-43-2     | 0.5 | 0.166 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Toluene                    | 108-88-3    | 1   | 0.543 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Ethylbenzene               | 100-41-4    | 1   | 0.141 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Chloromethane              | 74-87-3     | 4   | 0.932 | ug/kg | 52-130   | 30      | 52-130   | 30     | 30        |           |  |
| Bromomethane               | 74-83-9     | 2   | 0.581 | ug/kg | 57-147   | 30      | 57-147   | 30     | 30        |           |  |
| Vinyl chloride             | 75-01-4     | 1   | 0.335 | ug/kg | 67-130   | 30      | 67-130   | 30     | 30        |           |  |
| Chloroethane               | 75-00-3     | 2   | 0.452 | ug/kg | 50-151   | 30      | 50-151   | 30     | 30        |           |  |
| 1,1-Dichloroethene         | 75-35-4     | 1   | 0.238 | ug/kg | 65-135   | 30      | 65-135   | 30     | 30        |           |  |
| trans-1,2-Dichloroethene   | 156-60-5    | 1.5 | 0.137 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Trichloroethene            | 79-01-6     | 0.5 | 0.137 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,2-Dichlorobenzene        | 95-50-1     | 2   | 0.144 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,3-Dichlorobenzene        | 541-73-1    | 2   | 0.148 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,4-Dichlorobenzene        | 106-46-7    | 2   | 0.171 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Methyl tert butyl ether    | 1634-04-4   | 2   | 0.201 | ug/kg | 66-130   | 30      | 66-130   | 30     | 30        |           |  |
| p/m-Xylene                 | 179601-23-1 | 2   | 0.56  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| o-Xylene                   | 95-47-6     | 1   | 0.291 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Xylene (Total)             | 1330-20-7   | 1   | 0.291 | ug/kg |          |         |          | 30     | 30        |           |  |
| cis-1,2-Dichloroethene     | 156-59-2    | 1   | 0.175 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| 1,2-Dichloroethene (total) | 540-59-0    | 1   | 0.137 | ug/kg |          |         |          | 30     | 30        |           |  |
| Dibromomethane             | 74-95-3     | 2   | 0.238 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Styrene                    | 100-42-5    | 1   | 0.196 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |  |
| Dichlorodifluoromethane    | 75-71-8     | 10  | 0.915 | ug/kg | 30-146   | 30      | 30-146   | 30     | 30        |           |  |
| Acetone                    | 67-64-1     | 10  | 4.811 | ug/kg | 54-140   | 30      | 54-140   | 30     | 30        |           |  |







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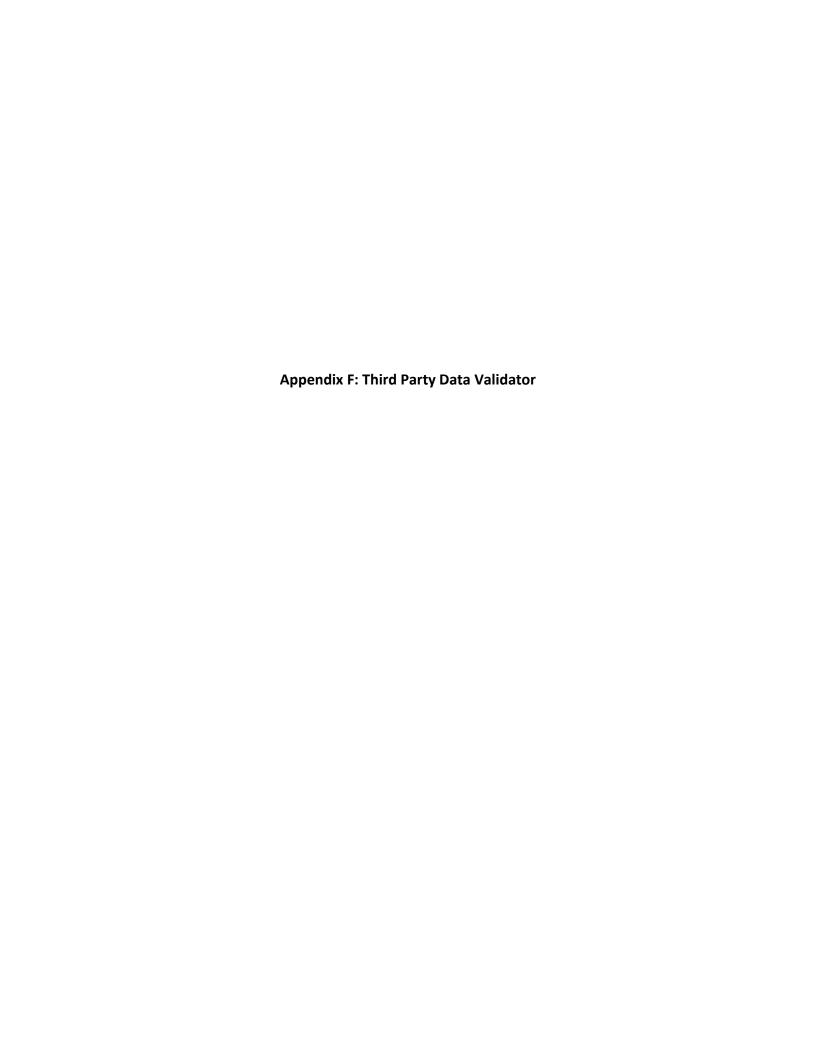
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#### TCL Volatiles - EPA 8260C/5035 High&Low (SOIL)

|  |                |          |       |       | LCS      |         | MS       |        | Duplicate | Surrogate |          |   |
|--|----------------|----------|-------|-------|----------|---------|----------|--------|-----------|-----------|----------|---|
| Analyte  | CAS #          | RL       | MDL   | Units | Criteria | LCS RPD | Criteria | MS RPD | RPD       | Criteria  |          |   |
| Carbon disulfide                                       | 75-15-0        | 10       | 4.55  | ug/kg | 59-130   | 30      | 59-130   | 30     | 30        |           |          |   |
| 2-Butanone   | 78-93-3        | 10       | 2.22  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Vinyl acetate  | 108-05-4       | 10       | 2.15  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 4-Methyl-2-pentanone                                   | 108-10-1       | 10       | 1.28  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2,3-Trichloropropane                                 | 96-18-4        | 2        | 0.127 | ug/kg | 68-130   | 30      | 68-130   | 30     | 30        |           |          |   |
| 2-Hexanone   | 591-78-6       | 10       | 1.18  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Bromochloromethane                                     | 74-97-5        | 2        | 0.205 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 2,2-Dichloropropane                                    | 594-20-7       | 2        | 0.202 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2-Dibromoethane                                      | 106-93-4       | 1        | 0.279 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,3-Dichloropropane                                    | 142-28-9       | 2        | 0.167 | ug/kg | 69-130   | 30      | 69-130   | 30     | 30        |           |          |   |
| 1,1,1,2-Tetrachloroethane                              | 630-20-6       | 0.5      | 0.132 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Bromobenzene   | 108-86-1       | 2        | 0.145 | ua/ka | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| n-Butylbenzene   | 104-51-8       | 1        | 0.167 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| sec-Butylbenzene                                       | 135-98-8       | 1        | 0.146 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| tert-Butylbenzene                                      | 98-06-6        | 2        | 0.118 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| o-Chlorotoluene  | 95-49-8        | 2        | 0.191 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| p-Chlorotoluene  | 106-43-4       | 2        | 0.108 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2-Dibromo-3-chloropropane                            | 96-12-8        | 3        | 0.998 | ug/kg | 68-130   | 30      | 68-130   | 30     | 30        |           |          |   |
| Hexachlorobutadiene                                    | 87-68-3        | 4        | 0.169 | ug/kg | 67-130   | 30      | 67-130   | 30     | 30        |           |          |   |
| Isopropylbenzene                                       | 98-82-8        | 1        | 0.109 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| p-Isopropyltoluene                                     | 99-87-6        | 1        | 0.109 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Naphthalene  | 91-20-3        | 4        | 0.65  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Acrylonitrile  | 107-13-1       | 4        | 1.15  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| n-Propylbenzene  | 103-65-1       | 1        | 0.171 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2,3-Trichlorobenzene                                 | 87-61-6        | 2        | 0.322 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2,4-Trichlorobenzene                                 | 120-82-1       | 2        | 0.272 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,3,5-Trimethylbenzene                                 | 108-67-8       | 2        | 0.193 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,2,4-Trimethylbenzene                                 | 95-63-6        | 2        | 0.334 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1,4-Dioxane  | 123-91-1       | 80       | 35.1  | ug/kg | 65-136   | 30      | 65-136   | 30     | 30        |           |          |   |
| 1,4-Diethylbenzene                                     | 105-05-5       | 2        | 0.177 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 4-Ethyltoluene   | 622-96-8       | 2        | 0.384 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          | - |
| 1,2,4,5-Tetramethylbenzene                             | 95-93-2        | 2        | 0.191 | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| Ethyl ether  | 60-29-7        | 2        | 0.341 | ug/kg | 67-130   | 30      | 67-130   | 30     | 30        |           |          |   |
| trans-1.4-Dichloro-2-butene                            | 110-57-6       | 5        | 1.42  | ug/kg | 70-130   | 30      | 70-130   | 30     | 30        |           |          |   |
| 1.2-Dichloroethane-d4                                  | 17060-07-0     | <u> </u> | T     | 31 9  | 1        | 1       | 1        | 1      |           | 70-130    |          |   |
| 2-Chloroethoxyethane                                   | 1,000 0, 0     |          |       |       |          |         |          |        |           | 1 222     |          |   |
| Toluene-d8   | 2037-26-5      |          |       |       |          | 1       | 1        |        |           | 70-130    |          |   |
| 4-Bromofluorobenzene                                   | 460-00-4       |          |       |       |          |         |          | 1      |           | 70-130    |          |   |
| Dibromofluoromethane                                   | 1868-53-7      |          |       |       |          |         |          |        |           | 70-130    |          |   |
| 2 D. G. Torrado G. | 1000 33 7      |          |       |       |          |         |          | 1      |           | 7,0 150   |          |   |
|  |                |          |       |       |          |         |          |        |           |           | <u> </u> |   |
|  |                |          |       |       |          |         |          |        |           |           |          |   |
|  | Diagon Note th |          | 1     |       |          |         |          |        |           |           |          |   |







#### RESUME CHRISTINA RINK-ASHDOWN

#### **EDUCATION**

BS Biology, 2006 University of California, San Diego

#### PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc. Inorganic Chemist 2009 to present

Enviromatrix Analytical, Inc. Metals Chemist 2007 to 2009

#### REPRESENTATIVE EXPERIENCE

Ms. Rink-Ashdown has over 11 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the trace metals, radiochemistry, and wet chemistry areas for major Federal and commercial projects. Her laboratory experience includes hands-on CLP and SW-846 ICP/CVAA analysis and overall technical review of data deliverables. Specifically, Ms. Rink-Ashdown has over 6 years inorganic and radiochemistry data validation experience using USEPA (including Region III) functional guidelines and other applicable documents.

As chemist with LDC, Ms. Rink-Ashdown specializes in the data validation of trace metals, wet chemistry, methyl mercury and radiochemistry analyses using USEPA functional guidelines or equivalent protocol. She has worked under various CERCLA and EPA data validation guidelines for the various CERCLA, Navy, Army Corps, AFCEE/AFCEC and commercial projects. She is certified as a "Radiometric Data Validation Specialist" through course work and testing by the Radiochemistry Society. Ms. Rink-Ashdown has validated over 2,000 samples for various isotopes in the last two years.

Ms. Rink-Ashdown has over 2 years of environmental laboratory experience in a laboratory performing the analyses of inorganic parameters.

As lead inorganic chemist at Enviromatrix Analytical, Inc., Ms. Rink-Ashdown managed the inorganic chemistry section which performed techniques such as atomic absorption and inductively coupled argon plasma spectrometry. These analyses were performed from methods referenced in EPA CLP, SW-846, and Standard Methods documents.

## Appendix F

Vapor Barrier Specifications

Remedial Action Work Plan
NYSDEC BCP #C241254





#### DRAGO® WRAP VAPOR INTRUSION BARRIER

A STEGO TECHNOLOGY, LLC INNOVATION | VAPOR RETARDERS 07 26 00, 03 30 00 | VERSION: JAN 20, 2021

#### 1. PRODUCT NAME

#### **DRAGO WRAP VAPOR INTRUSION BARRIER**

#### 2. MANUFACTURER

c/o Stego® Industries, LLC\*
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance

Ph: (877) 464-7834 Fx: (949) 257-4113 www.stegoindustries.com



#### 3. PRODUCT DESCRIPTION

USES: Drago Wrap is specifically engineered to attenuate volatile organic compounds (VOCs) and serve as a below-slab moisture vapor barrier.

COMPOSITION: Drago Wrap is a multi-layered plastic extrusion that combines uniquely designed materials with only high grade, prime, virgin resins.

ENVIRONMENTAL FACTORS: Drago Wrap can be used in systems for the control of various VOCs including hydrocarbons, chlorinated solvents, radon, methane, soil poisons, and sulfates.

#### 4.) TECHNICAL DATA

#### TABLE 4.1: PHYSICAL PROPERTIES OF DRAGO WRAP VAPOR INTRUSION BARRIER

| PROPERTY   | TEST   | RESULTS  |
|--|--|--|
| Under Slab Vapor Retarders   | ASTM E1745 – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs  | ASTM E1745 Compliant   |
| Water Vapor Permeance  | ASTM F1249 – Test Method for Water Vapor Transmission Rate Through Plastic<br>Film and Sheeting Using a Modulated Infrared Sensor  | 0.0069 perms   |
| Push-Through Puncture  | ASTM D4833 – Test Method for Index Puncture Resistance of Geotextiles,<br>Geomembranes, and Related Products   | 183.9 Newtons  |
| Tensile Strength   | ASTM D882 – Test Method for Tensile Properties of Thin Plastic Sheeting  | 53.5 lbf/in  |
| Permeance After Conditioning<br>(ASTM E1745<br>Sections 7.1.2 - 7.1.5) | ASTM E154 Section 8, F1249 – Permeance after wetting, drying, and soaking<br>ASTM E154 Section 11, F1249 – Permeance after heat conditioning<br>ASTM E154 Section 12, F1249 – Permeance after low temperature conditioning<br>ASTM E154 Section 13, F1249 – Permeance after soil organism exposure | 0.0073 perms<br>0.0070 perms<br>0.0062 perms<br>0.0081 perms |
| Hydrocarbon Attenuation Factors  | Contact Stego Industries' Technical Department   |  |
| Chlorinated Solvent<br>Attenuation Factors                             | Contact Stego Industries' Technical Department   |  |
| Methane Transmission Rate  | ASTM D1434 – Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting   | 7.0 GTR**<br>(mL(STP)/m <sup>2</sup> *day)                   |
| Radon Diffusion Coefficient  | K124/02/95   | 9.8 x 10 <sup>-14</sup> m <sup>2</sup> /second               |
| Thickness  |  | 20 mil   |
| Roll Dimensions  |  | 14' x 105'<br>or 1,470 ft <sup>2</sup>                       |
| Roll Weight  |  | 150 lb   |

Note: perm unit = grains/( $ft^2*hr*in-Hg$ ) \*\*\* GTR = Gas Transmission Rate

#### DRAGO® WRAP VAPOR INTRUSION BARRIER

A STEGO TECHNOLOGY, LLC INNOVATION | VAPOR RETARDERS 07 26 00, 03 30 00 | VERSION: JAN 20, 2021

#### 5. INSTALLATION

UNDER SLAB: Unroll Drago Wrap over a tamped aggregate, sand, or earth base. Overlap all seams a minimum of 12 inches and tape using DragoSeal™ Tape. All penetrations must be sealed using a combination of Drago Wrap and Drago Accessories.

Review Drago Wrap's complete installation instructions prior to installation.

#### 6. AVAILABILITY & COST

Drago Wrap is available nationally through our network of building supply distributors. For current cost information, contact your local Drago distributor or Stego Industries' Sales Representative.

#### 7. WARRANTY

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. Stego Technology, LLC does offer a limited warranty on Drago Wrap. Please see www.stegoindustries.com/legal.

#### 8. MAINTENANCE

Store Drago Wrap in a dry and temperate area.

#### 9. TECHNICAL SERVICES

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries or by visiting the website.

**Contact Number:** (877) 464-7834

Website: www.stegoindustries.com

#### 10. FILING SYSTEMS

www.stegoindustries.com





# DRAGO WRAP VAPOR INTRUSION BARRIER INSTALLATION INSTRUCTIONS



LIFE OF THE BUILDING™ PROTECTION





Additional Drago Wrap installation resources and videos are available on our website at:



www.stegoindustries.com/resources

## CONTENTS

The installation recommendations set forth in these instructions are generally based on ASTM E1643 and specific applications of Drago products. Each section provides explanations and options for the varying conditions.

| SECTION 1 | Drago Wrap and Drago Accessories                | 3   |
|-----------|---|-----|
| SECTION 2 | Creating a Monolithic Membrane                  | 4   |
| SECTION 3 | Where to Terminate the Drago Wrap               | 5   |
| SECTION 4 | Sealing Drago Wrap at Terminating Edges         | 6,7 |
| SECTION 5 | Sealing Damaged Areas                           | 8   |
| SECTION 6 | Sealing Single Pipe Penetrations                | 9   |
| SECTION 7 | Sealing Multiple Pipe Penetrations              | 10  |
| SECTION 8 | Avoid Punctures with Beast Concrete Accessories | 11  |

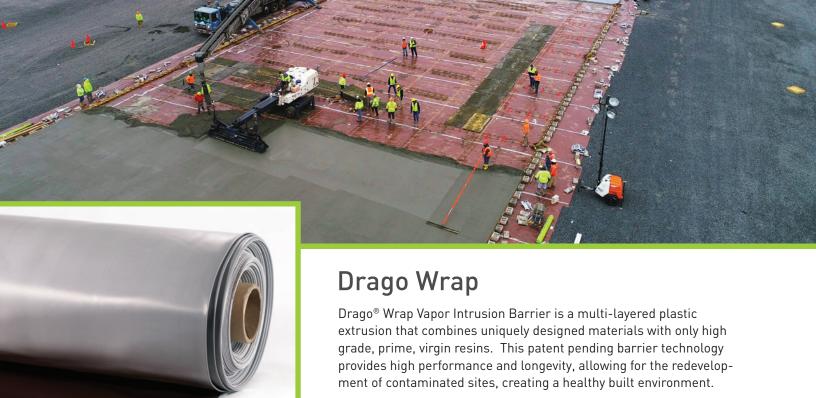


#### Stego Installation Support - A Free Service

When you choose **Stego® Barrier Solutions** and products, you gain access to a large nationwide network of full-time technical sales representatives providing unmatched local support and service. If you ever have a question or concern regarding the following installation scenarios please contact us and take advantage of our free Stego Installation Support.

 $For compliance with LARR \ regulations, some \ additional \ installation \ methods \ are \ required. \ For \ more \ information, \ visit:$ 

www.stegoindustries.com/drago-larr-specific-installation-instructions



#### **Drago Accessories**

At Stego, we know every project has its own unique challenges. To make a Drago Wrap installation easy and flexible, we offer an extensive line of accessory items that gives you options to create a monolithic membrane between all interior intrusion pathways and vapor sources below the slab as well as at the slab perimeter. **Consult the project architect, owner's representative, and design engineer of record before proceeding with any of these options.** 



#### **DragoSeal**<sup>™</sup> **Tape**

Combines Drago Wrap technology with a powerful adhesive for a barrier solution to seal seams, patches, and other details, defending against vapor intrusion.



#### DragoTack® Tape

A solvent-resistant, double-sided adhesive strip used to bond and seal Drago Wrap to concrete, masonry, wood, metal, and other surfaces.



#### Drago<sup>®</sup> Mastic

A polymer-modified anionic asphalt emulsion, designed to be used with Drago Wrap, for sealing utility, pipe penetrations, and terminating edges.



#### Drago<sup>®</sup> Tape

This pressure-sensitive adhesive, coupled with the same uniquely designed materials as Drago Wrap, makes it suitable for sealing pipe penetrations.



#### Drago<sup>®</sup> Sealant

A two-component, highperformance epoxy, designed to be used with Drago Wrap for sealing utility and pipe penetrations.



#### Drago<sup>®</sup> Sealant Form

A low-density, cross-linked, closed-cell polyethylene foam designed to be used as a detailing piece with Drago Sealant.

## Creating a Monolithic Membrane

The key to an effective Drago Wrap installation is to create a monolithic layer of protection between the building foundation and vapor sources below. While Drago Wrap installation instructions are generally based on ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs, these instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding.

ASTM E1643 discusses the selection of the vapor retarder and preparation of the subbase to minimize potential damage during installation and concrete placement.

ASTM E1643, Section 5.3.4.1 - Select a vapor retarder material capable of withstanding potential construction site damage. ASTM E1643, Section 5.3.5.1 - Select vapor retarder material capable of withstanding tear or puncture damage due to the type, gradation, and texture of the base material to be installed below the material. Prepare base material to minimize risk of puncture, for example, by rolling or compacting.

ASTM E1643, Section 6.1 - Level and compact base material.

ASTM E1643 then states to create a monolithic membrane to protect the slab from adjacent moisture sources.

ASTM E1643, Section 6.4 - . . . create a monolithic membrane between the surface of the slab and vapor sources below the slab as well as at the slab perimeter.

ASTM E1643, Section 6.5 - Lap joints as instructed by the manufacturer and seal laps in accordance with the manufacturer's recommendations.

Drago Wrap can be installed over an aggregate, sand, or tamped earth base. It is not typically necessary to have a cushion layer or sand base, as Drago Wrap is tough enough to withstand rugged construction environments. Consult the design team for project-specific recommendations.



Unroll Drago Wrap over the area where the slab is to be placed.

Note: Grey color side of membrane is facedown, conner solar side if face up.



Ensure Drago Wrap is clean and dry when applying DragoSeal Tape.

Tip: Use a cloth or other means to remove dust, debris, and excess moisture from Drago Wrap prior to applying DragoSeal Tape.



Unless otherwise indicated by the design professional(s) of record, unfold Drago Wrap to completely cover the placement area.



Seal the seams with DragoSeal Tape. Note: Remove the release liner on one side of DragoSeal Tape prior to application. Apply pressure to DragoSeal Tape after application.



All joints/seams should be overlapped a minimum of 12 inches.



**OPTIONAL SEALING METHOD:**Hot air wedge welding equipment is ideal for heat welding seams of Drago Wrap.



## Where to Terminate the Drago Wrap

Always consult the project design team for where to terminate the vapor barrier to strike a balance between the location of the vapor barrier on or around foundation constructions and any structural concerns before proceeding.

#### ASTM E1643 provides direction on where to terminate the vapor barrier as follows:

ASTM E1643, Section 6.4 - Extend vapor retarder over footings and seal to foundation wall, grade beam, or slab at an elevation consistent with the top of the slab or terminate at impediments such as waterstops or dowels...

ASTM E1643, Section 6.6 - Extend vapor retarder over the tops of pile caps and grade beams to a distance acceptable to the structural engineer.

#### In accordance with ASTM E1643, terminate the Drago Wrap as follows:

At an elevation (height) consistent with the top of the slab;





Note: Turn Drago Wrap up foundation walls or forms. Ensure Drago Wrap is flush against the corner to avoid tenting.

At Impediments; OR





Note: Impediments may include rebar, dowels, water stops, etc. and may be located at interior grade beams in addition to perimeter walls and footings.

At a location of termination designated by the project design team.





Note: The distance to which the vapor barrier is extended adjacent to, onto, or completely over a footing or grade beam should be determined by the project design team.

If the location of vapor barrier termination has not been clearly addressed in the construction documents, then clarification should be requested from the project design team. Should no direction be given, Stego recommends the project team follow, at minimum, the guidelines of ASTM E1643.

Regardless of where the vapor barrier is determined to be terminated, ASTM E1643 requires the terminating edges to be sealed.

## Sealing the Terminating Edges of Drago Wrap Up Foundation Walls & Vertical Surfaces Using DragoTack Tape

DragoTack Tape can be used to seal Drago Wrap to foundation walls, grade beams or other adjacent concrete constructions.

IMPORTANT: Make sure the area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion.



Remove the release liner on one side of DragoTack Tape and adhere to foundation wall at the height of the slab or at impediments.



When ready to apply Drago Wrap, remove the exposed release liner from DragoTack Tape.



Press Drago Wrap firmly against DragoTack Tape to secure.



**MECHANICAL SEAL OPTION:** If a mechanical seal is needed, fasten a termination bar over the top of the Drago Wrap inline with the DragoTack Tape.

## Sealing Drago Wrap Up Foundation Walls and Vertical Surfaces Using Drago Mastic

IMPORTANT: Make sure the area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion.



Apply Drago Mastic to the foundation wall at the anticipated edge of the subsequently applied Drago Wrap at the height of the slab or impediments.



Press Drago Wrap firmly against the applied Drago Mastic on the foundation wall.



**MECHANICAL SEAL OPTION:** If a mechanical seal is needed, fasten a termination bar over the top of the Drago Wrap inline with the DragoTack Tape.

## DRAGO

## Sealing the Terminating Edges of Drago Wrap on a Horizontal Plane

Always consult the project design team for where to terminate the vapor barrier to strike a balance between the location of the vapor barrier on or around foundation constructions and any structural concerns before proceeding.

After the location of where to terminate the vapor barrier has been determined, seal Drago Wrap along all terminating edges as indicated by the project team.

#### Using DragoTack Tape



Onto a Perimeter Footing at Impediments: Seal Drago Wrap to concrete with DragoTack Tape.



Onto Interior Grade Beams at Impediments: Seal Drago Wrap to concrete with DragoTack Tape.



At a Location Designated by the Design Team: Seal Drago Wrap to concrete with DragoTack Tape.



MECHANICAL SEAL OPTION:
If a mechanical seal is needed,
fasten a termination bar over
the top of the Drago Wrap inline
with the DragoTack Tape.

#### **Using Drago Mastic**



Onto a Perimeter Footing at Impediments: Seal Drago Wrap to concrete with Drago Mastic.



Onto Interior Grade Beams at Impediments: Seal Drago Wrap to concrete with Drago Mastic.



At a Location Designated by the Design Team: Seal Drago Wrap to concrete with Drago Mastic.



MECHANICAL SEAL OPTION:
If a mechanical seal is needed,
fasten a termination bar over
the top of the Drago Wrap inline
with the DragoTack Tape.

See
"Where to Terminate the Vapor Barrier"
on page 5 prior to choosing your
terminating edge sealing accessory.

## Sealing Damaged Areas: Small Hole or Slice

In the event that Drago Wrap is damaged during or after installation, repairs must be made. For smaller holes or slices in Drago Wrap, DragoSeal Tape can be used as noted below.



Small hole or slice in Drago Wrap.



Clean area of adhesion.



Center DragoSeal Tape over small hole or slice in Drago Wrap. Apply pressure to DragoSeal Tape after application.

## Sealing Damaged Areas: Larger Hole

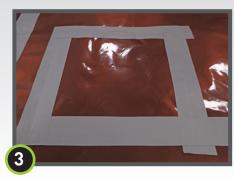
In the event that Drago Wrap is damaged during or after installation, repairs must be made. For larger holes, cut a piece of Drago Wrap to a size and shape that covers any damage by a minimum overlap of 6" in all directions. Clean all adhesion areas of dust, dirt, moisture, and frost. Tape down all edges using DragoSeal Tape.



Occasionally there are larger holes in the vapor barrier that require a patch.



Measure and cut a piece of Drago Wrap to cover damaged area 6" in all directions. Clean area of adhesion.



Seal the patch with DragoSeal Tape.

## DRAGO

## Sealing Single Pipe Penetration: **Minimal Void Space**

All penetrations must be sealed. All pipe, ducting, rebar, wire penetrations and block outs should be sealed using Drago Wrap and either DragoSeal Tape, Drago Tape, Drago Mastic, or Drago Sealant and Drago Sealant Form. If penetrations are encased in other materials, such as expansive materials like foam, unless otherwise specified, Drago Wrap should be sealed to the underlying penetration directly.



Install Drago Wrap around pipe penetrations by slitting/cutting material as needed. Try to minimize the void space created.



Pull material over and flatten. Clean area of adhesion where Drago accessory will be applied.



If Drago Wrap is close to pipe and void space is minimized then seal around pipe penetration with either DragoSeal Tape (as shown), Drago Tape, Drago Mastic or Drago Sealant and Drago Sealant Form.

#### Sealing Single Pipe Penetration: Larger Void Space Requires Detail Patch

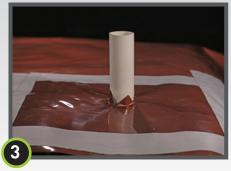
To minimize void space around a larger penetration, a detail patch may be required.



Cut a detail patch to a size and shape that creates a 6" overlap on all edges around the void space at the base of the pipe.



Cut an "X" the size of the pipe diameter in the center of the detail patch and slide tightly over pipe.



Seal all sides of the detail patch with DragoSeal Tape.



Seal around the base of the pipe using DragoSeal Tape (as shown) or Drago Tape.



Seal around the base of the pipe with Drago Mastic. Note: apply using disposable glove, paint brush, or similar.

## Sealing Multiple Pipe Penetrations: Using Drago Mastic <u>or</u> Using Drago Sealant and Drago Sealant Form

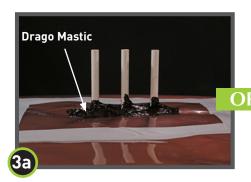
Multiple pipe penetrations in close proximity and very small pipes may be most efficiently sealed using Drago Wrap and Drago Mastic, or Drago Wrap, Drago Sealant, and Drago Sealant Form.



Cut a slit the size to accommodate the width of the multiple pipes. Try to minimize the void space created.



Place a detail patch over and around the base of the pipe penetrations as closely as possible, ensuring that it is flush with the base of the penetrations. Seal all sides of the detail patch with DragoSeal Tape.

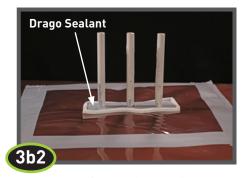


Apply Drago Mastic around the entire perimeter of the group of penetrations and between the penetrations to fill any void spaces present.

Note: apply using disposable glove, paint brush, or similar.



Install Drago Sealant Form continuously to Drago Wrap and around the entire perimeter of the group of penetrations and at least 1 inch beyond the terminating edge of Drago Wrap.



Pour Drago Sealant inside of Drago Sealant Form to create a seal around the penetrations.

Note: If the void space between Drago Wrap and the penetrations is not minimized and/or the base course allows for too much drainage of sealant, a second coat of Drago Sealant may need to be poured after the first application has cured.

Drago Sealant pot/working life is roughly 30-45 minutes.



### Avoid Punctures with Beast® Concrete Accessories

To help eliminate the use of non-permanent penetrations in Drago Wrap installation, Stego Industries recommends the use of Beast vapor barrier-safe concrete accessories.

IMPORTANT: Avoid puncturing Drago Wrap with stakes while forming, bracing, and screeding.



**BEAST® FORM STAKE** can be used with **BEAST® FOOT** as part of the Stego vapor barrier-safe forming system which meets ASTM E1643 requirements.



This concrete form stake takes the place of traditional nail stakes for interior forming applications, utilizing SpeedTrack™ Fastening Grooves for unlimited fastener placement.

Note: Refer to Beast Form Stake Installation Guide for detailed usage instructions.



Beast Form Stake is strong enough to withstand a beating during concrete placement while holding its shape. It is easy to remove and reusable for the next job.

Note: Beast Form Stake can be removed once concrete has set sufficiently to hold its shape. Fill and repair any voids in the concrete as necessary once the Beast Form Stake has been removed and strike Beast Form Stake against a hard surface to loosen the concrete buildup.



#### BEAST® HOOK is a

**faster**, **easier** way to set 2x4 overhead screeds. Use Beast Foot and Beast Form Stake and make it a vapor barrier-safe screed system.

No tools are required, just grip the knob to loosen or tighten. Fast, easy, efficient.



**BEAST® SCREED** is a fixed-elevation, point-to-point guide screed system designed to replace common wetscreed methods.

Improve efficiency and maintain concrete floor levelness with the BEAST SCREED SYSTEM!



Set it and forget it. Beast Screed eliminates the need to frequently reestablish grade to ensure floor elevation has not changed during the screeding operation as is typical with traditional wet-screed methods.

Note: Refer to Beast Screed System Installation Instructions for detailed usage instructions.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.



#### STEGO INSTALLATION SUPPORT

#### PEACE OF MIND IS OF GREAT VALUE... A FREE SERVICE OFFERED BY STEGO INDUSTRIES\*

When you choose Stego® Barrier Solutions and products, you gain access to a large nationwide network of full-time technical sales representatives providing unmatched local support and service.

Please contact us to get in touch with the nearest Drago representative.\* We look forward to working with you on your next project. 877-464-7834 | www.stegoindustries.com





## Appendix G

Specifications and Safety Data Sheets for Injection Program Reagents

> Remedial Action Work Plan NYSDEC BCP #C241254



| Proje   | ct Info                          |              | PlumeStop® Application De  | esign Summary  |  |
|---|----------------------------------|--------------|--|--|--|
| 13-12 to 13-24 Be                               | each Channel Dri                 | ve           | Dissolved Plum   | e  |  |
| Queens,   | New York                         |              | PlumeStop + S-M  | ZVI  | Technical Notes  |
| Dissolve  | ed Plume                         |              | Treatment Type   | Barrier  |  |
| Prepa   | red For:                         |              | Distance Perpendicular to Flow (ft)  | 130  |  |
| Impact Environm                                 | nental Closure, Inc.             |              | Spacing Within Rows (ft)   | 6  |  |
| Target Treatment Zone (TTZ) Info                | Unit                             | Value        | Number of Rows   | 1  |  |
| Barrier Length                                  | ft                               | 130          | DPT Injection Points   | 22   |  |
| Top Treat Depth                                 | ft                               | 16.0         | Top Application Depth (ft bgs)   | 16   |  |
| Bot Treat Depth                                 | ft                               | 26.0         | Bottom Application Depth (ft bgs)  | 26   |  |
| Vertical Treatment Interval                     | ft                               | 10.0         | PlumeStop to be Applied (lbs)  | 4,000  |  |
| Treatment Zone Volume                           | ft <sup>3</sup>                  | 10,400       | PlumeStop to be Applied (gals)   | 444  |  |
| Treatment Zone Volume                           | су                               | 385          | In Situ Chemical Reduction   |  |  |
| Soil Type                                       |                                  | sand         | S-MZVI to be added to PlumeStop (lbs)  | 900  |  |
| Porosity  | cm <sup>3</sup> /cm <sup>3</sup> | 0.33         | S-MZVI to be added to FlumeStop (iss)  | 60   |  |
| '   | cm³/cm³                          |              |  |  |  |
| Effective Porosity Treatment Zone Pore Volume   |                                  | 0.20         | PlumeStop + S-MZVI Volu  |  |  |
|   | gals                             | 25,673       | Mixing Water (gal)   | 9,143  |  |
| Treatment Zone Effective Pore Volume            | gals                             | 15,559       | Total Application Volume (gals)  | 9,654  |  |
| Treatment Zone Pore Volume                      | liters                           | 97,183       | Injection Volume per Point (gals)  | 439  |  |
| Treatment Zone Effective Pore Volume            | liters                           | 58,899       |  |  |  |
| Fraction Organic Carbon (foc)                   | g/g                              | 0.002        |  |  |  |
| Soil Density                                    | g/cm³                            | 1.7          |  |  |  |
| Soil Density                                    | lb/ft <sup>3</sup>               | 108          |  |  |  |
| Soil Weight                                     | lbs                              | 1.1E+06      |  |  |  |
| Hydraulic Conductivity                          | ft/day                           | 25.0         |  |  |  |
| Hydraulic Conductivity                          | cm/sec                           | 8.82E-03     |  |  |  |
| Hydraulic Gradient                              | ft/ft                            | 0.003        |  |  |  |
| GW Velocity                                     | ft/day                           | 0.38         |  |  |  |
| GW Velocity                                     | ft/yr                            | 137          |  |  |  |
|   |                                  |              |  | Assumptions/Qualifications   |  |
|   |                                  |              | In generating this preliminary estimate, Regenesis relied upolinformation as input, we performed calculations based upon   |  |  |
|   |                                  |              | subsurface placement required to affect remediation of the s   |  | ,  |
|   |                                  |              | REGENESIS developed this Scope of Work in reliance upon the environmental site assessment(s). The fees and charges asses thus may not conform to billing guidelines, constraints or other states of the conformation of the confor | ociated with the Scope of Work were generated the limits on fees. REGENESIS does not seek rein | through REGENESIS' proprietary formulas and<br>abursement directly from any government |
| Application Dosing                              | Unit                             | Value        | agency or any governmental reimbursement fund (the "Gove<br>an entity which seeks reimbursement from the Government  |  |  |
|   |                                  |              | responsibility of the entity seeking reimbursement to ensure   | ·  | · · · · · · · · · · · · · · · · · · ·  |
| PlumeStop to be Applied<br>S-MZVI to be Applied | lbs<br>lbs                       | 4,000<br>900 | Government prior to submission. When serving as a supplier does not knowingly present or cause to be presented any cla   |  |  |
|   |                                  |              |  | Prepared by: Ow<br>Date: 1/0   | ven Miller - Sr. Design Specialist<br>6/2022   |



#### Monitoring

Performance monitoring wells for the proposed PlumeStop barrier should be screened at the same vertical interval as the injections. The proposed vertical interval for this estimate is currently 16 to 26 feet below ground surface(bgs). We do not expect to see results in any wells upgradient of the barrier or outside of this interval. Within this proposal it is suggested that groundwater monitoring parameters will be collected monthly for the 1<sup>st</sup> 3 months, and quarterly thereafter. To help support performance evaluations, REGENESIS requests the data collected be provided to us in a timely manner.

#### **Qualifiers (Design Considerations)**

Included below, a list of pertinent qualifiers has been provided to better define performance expectations at this site. REGENESIS will be happy to discuss these with you in detail.

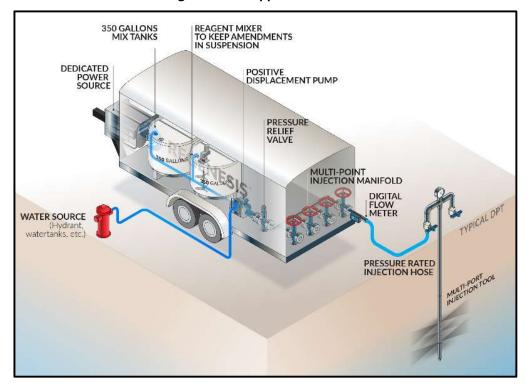
- Seepage velocity/mass flux is a primary driver of dose for PlumeStop projects. This is the basis for our recommendation of Flux Mapping Tool at your site.
  - o Groundwater velocity was estimated. A seepage velocity of 137 feet per year was used for this design.
  - Due to the low contaminant concentrations and low estimated groundwater velocity, the FluxTracers may not be able to accurately produce results. From this we can conclude that groundwater speed is below a certain value. The most important use of this tool is to identify any particularly high flux zones within the interval (if any).
- As indicated above only downgradient wells screened within the target injection interval should be used to evaluate performance of the PlumeStop barrier.
- Reductions in any other on-site wells should not be expected from this treatment.
- Post-injection groundwater sampling is ideal for collection and laboratory analysis when no colloidal activated carbon (black color) is observed within the sample. Carbon in post-injection groundwater samples can interfere with commercial analytical methods and/or alter the results. The carbon (black color) may require labs to dilute samples before analysis, which may result in erroneously high concentrations. A recommended option for post-injection sampling is as follows:
  - Delay sampling. The recommended solution is to delay sampling and analysis until PlumeStop has had more time to deposit in the subsurface which will result in clarified groundwater samples. At many sites, 2 to 4 weeks is sufficient, although it can take up to three months. We expect the relative time to correlate with the amount of clay and silt present: less time will be required with increased clay and silt content. There have been some cases where additional well purging has helped to accelerate the ability to collect clear groundwater samples. As a rule of thumb, if you can see through the sample in a VOA vial when held up to the light, even a little bit, then the samples are ok to analyze.

#### **Work Plan Summary**

RRS will work under the direction of Impact to implement the field work associated with the application of the selected remediation technologies. Responsibilities for the implementation of this scope of work will be shared between RRS and Impact. Responsibilities for each are outlined in this section and further under the Assumptions/Qualification section.



At the beginning of each day a safety tailgate meeting will be conducted and an overview of the procedures, responsibilities and goals for the day will be discussed. RRS will be equipped with multiple injection tool options to use with 1.5-inch diameter DPT rods. The injection tool string will be advanced to the top or bottom of the TTZ and injections will be performed in a bottom-up or top-down method depending on site and lithology conditions. The remediation technologies will be mixed in an injection trailer (Figure 2) with water in batches at the designated solution percentage and kept in constant suspension throughout the injection application. Pressures, flow rates and total volume will be monitored and digitally documented for each injection interval. Multiple injection points may be injected into simultaneously to increase efficiencies on-site. The injection points and surrounding areas will be monitored for any signs of surfacing and a spill response kit will be on standby.



**Figure 2: RRS Application Trailer** 

During the application, real-time information will be collected and analyzed to help verify design assumptions and subsurface reagent distribution. Depending on the primary product applied, data collected and analyzed may consist of groundwater quality parameters (i.e., pH, conductivity, DO, ORP, etc.), depth to water measurements, visual indicators through groundwater or soil samples, and in-field injection concentration test kits. This information is typically collected during the application when within 10 feet of an appropriately screened monitoring well. Based on the information collected, the project team may choose to modify the remediation design to further optimize the injection application. This includes modification to injection concentrations, volume per vertical foot, injection intervals, etc.

Once the injection event is completed, RRS will demobilize all equipment and personnel off-site. A detailed injection summary report which includes injection point data (interval depths, injection pressure/flow rates, reagent volume, time elapsed and if surfacing occurred), field observations and any other noteworthy information will be generated and made available to Impact.



#### PlumeStop<sup>®</sup> Liquid Activated Carbon<sup>™</sup> Technical Description

PlumeStop Liquid Activated Carbon is an innovative groundwater remediation technology designed to rapidly remove and permanently degrade groundwater contaminants. PlumeStop is composed of very fine particles of activated carbon (1-2 $\mu$ m) suspended in water through the use of unique organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix, binding to the aquifer matrix, rapidly removing contaminants from groundwater, and expediting permanent contaminant biodegradation.

This unique remediation technology accomplishes treatment with the use of highly dispersible, fast-acting, sorption-based technology, capturing and concentrating dissolved-phase contaminants within its matrix-like structure. Once contaminants are sorbed onto the regenerative matrix, biodegradation processes achieve complete remediation at an accelerated rate.



Distribution of PlumeStop in water

To see a list of treatable contaminants with the use of PlumeStop, view the Range of Treatable Contaminants Guide.

#### **Chemical Composition**

- Water CAS# 7732-18-5
- Colloidal Activated Carbon ≤2.5 CAS# µm 7440-44-0
- Proprietary Additives

#### **Properties**

- Physical state: Liquid
- Form: Aqueous suspension
- Color: Black
- Odor: Odorless
- pH: 8 10

#### Storage and Handling Guidelines

#### Storage

Store in original tightly closed container

Store away from incompatible materials

Protect from freezing

#### Handling

Avoid contact with skin and eyes

Avoid prolonged exposure

Observe good industrial hygiene practices

Wash thoroughly after handling

Wear appropriate personal protective equipment



#### PlumeStop® Liquid Activated Carbon™ Technical Description

#### **Applications**

PlumeStop is easily applied into the subsurface through gravity-feed or low-pressure injection.

#### Health and Safety

Wash hands after handling. Dispose of waste and residues in accordance with local authority requirements. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: <u>PlumeStop SDS</u>.



#### SAFETY DATA SHEET



#### 1. Identification

Product identifier PlumeStop®

Other means of identification None.

Recommended use Soil and Groundwater Remediation.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company Name Regenesis

Address 1011 Calle Sombra

San Clemente, CA 92673 USA

General information 949-366-8000

E-mail CustomerService@regenesis.com

Emergency phone number For Hazardous Materials Incidents ONLY (spill, leak, fire, exposure or accident), call

CHEMTREC 24/7 at:

**USA, Canada, Mexico** 1-800-424-9300

**International** 1-703-527-3887

#### 2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.
Signal word None.

**Hazard statement** The mixture does not meet the criteria for classification.

**Precautionary statement** 

**Prevention** Observe good industrial hygiene practices.

Response Wash hands after handling.

**Storage** Store away from incompatible materials.

**Disposal** Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise

classified (HNOC)

None known.

Supplemental information None.

#### 3. Composition/information on ingredients

#### **Mixtures**

| Chemical name                         | CAS number | %   |
|---------------------------------------|------------|-----|
| Water                                 | 7732-18-5  | >75 |
| Colloidal activated carbon<br>≤2.5 μm | 7440-44-0  | <25 |

Composition comments All concentrations are in percent by weight unless otherwise indicated.

4. First-aid measures

**Inhalation** Move to fresh air. Call a physician if symptoms develop or persist.

**Skin contact** Wash off with soap and water. Get medical attention if irritation develops and persists.

PlumeStop® SDS US

Rinse with water. Get medical attention if irritation develops and persists. Eye contact

Ingestion Rinse mouth. Get medical attention if symptoms occur. Direct contact with eyes may cause temporary irritation. Most important

symptoms/effects, acute and

delayed

Indication of immediate medical attention and special Treat symptomatically.

treatment needed **General information** 

If you feel unwell, seek medical advice (show the label where possible). Show this safety data sheet to the doctor in attendance.

#### 5. Fire-fighting measures

Suitable extinguishing media

Carbon dioxide, alcohol-resistant foam, dry chemical, water spray, or water fog.

Unsuitable extinguishing media

None known.

Specific hazards arising from

the chemical

During fire, gases hazardous to health may be formed. Combustion products may include: carbon monoxide, carbon dioxide, sodium oxides, metal oxides.

Special protective equipment and precautions for firefighters Use protective equipment appropriate for surrounding materials.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials. Use

water spray to keep fire-exposed containers cool.

General fire hazards This material will not burn until the water has evaporated. Residue can burn. When dry may form

combustible dust concentrations in air.

#### 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Avoid contact with spilled material. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

**Environmental precautions** 

Avoid discharge into drains, water courses or onto the ground.

#### 7. Handling and storage

Precautions for safe handling

Avoid contact with skin and eyes. Avoid prolonged exposure. Observe good industrial hygiene practices. Wash thoroughly after handling. Wear appropriate personal protective equipment (See Section 8).

Conditions for safe storage, including any incompatibilities Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Protect from freezing.

#### 8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-3 (29 CFR 1910.1000)

| Components  | Туре | Value    | Form                 |
|---|------|----------|----------------------|
| Colloidal activated carbon<br>≤2.5 µm (CAS 7440-44-0) | TWA  | 5 mg/m3  | Respirable fraction. |
|   |      | 15 mg/m3 | Total dust.          |
| <b>US. ACGIH Threshold Limit Values</b>               |      |          |                      |
| Components  | Туре | Value    | Form                 |
| Colloidal activated carbon                            | TWA  | 2 mg/m3  | Respirable fraction. |
| ≤2.5 µm (CAS 7440-44-0)                               |      |          |                      |

PlumeStop® SDS US **Biological limit values** 

No biological exposure limits noted for the ingredient(s).

Appropriate engineering

controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

**Eve/face protection** Wear approved chemical safety goggles.

Skin protection

Hand protection Rubber, neoprene or PVC gloves are recommended. Wash hands after handling.

Other Avoid contact with the skin. Wear suitable protective clothing.

**Respiratory protection** Not normally needed. In case of insufficient ventilation, wear suitable respiratory equipment. If

engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been

established), an approved respirator must be worn.

**Thermal hazards** Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective

equipment to remove contaminants.

#### 9. Physical and chemical properties

**Appearance** 

Physical state Liquid.

Form Aqueous suspension.

Color Black.
Odor Odorless.
Odor threshold Not available.

**pH** 8 - 10

Melting point/freezing point Not available.

Initial boiling point and boiling Not available.

range

Flash point Not flammable.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

(%)

Flammability limit - upper

Not available.

(%)

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density 1 - 1.2

Solubility(ies)

Solubility (water) Miscible.

Partition coefficient Not available.

(n-octanol/water)

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not available.

10. Stability and reactivity

**Reactivity**The product is stable and non-reactive under normal conditions of use, storage and transport.

**Chemical stability** Material is stable under normal conditions.

PlumeStop® SDS US

Possibility of hazardous

reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid

Contact with incompatible materials. Keep from freezing.

Incompatible materials

Strong oxidizing agents. Water reactive materials.

Hazardous decomposition

products

Combustion may produce: carbon monoxide, carbon dioxide, sodium oxides, metal oxides.

# 11. Toxicological information

### Information on likely routes of exposure

Inhalation Prolonged inhalation may be harmful.

Skin contact Prolonged or repeated skin contact may result in minor irritation.

Direct contact with eyes may cause temporary irritation. Eye contact

Ingestion Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics Direct contact with eyes may cause temporary irritation.

# Information on toxicological effects

Not expected to be acutely toxic. Acute toxicity

**Test Results** Components **Species** 

Colloidal activated carbon ≤2.5 µm (CAS 7440-44-0)

**Acute** Oral

LD50 Rat > 10000 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation. Serious eye damage/eye

Direct contact with eyes may cause temporary irritation.

irritation

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

No data available to indicate product or any components present at greater than 0.1% are Germ cell mutagenicity

mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

# IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

# NTP Report on Carcinogens

Not listed.

### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

This product is not expected to cause reproductive or developmental effects. Reproductive toxicity

Specific target organ toxicity -

single exposure

Not classified.

Specific target organ toxicity -

repeated exposure

Not classified.

**Aspiration hazard** Not an aspiration hazard.

**Chronic effects** Prolonged inhalation may be harmful.

### 12. Ecological information

The product is not classified as environmentally hazardous. However, this does not exclude the **Ecotoxicity** 

possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability

No data is available on the degradability of this product.

**Bioaccumulative potential** 

No data available.

Mobility in soil Expected to be temporarily highly mobile in soil.

Other adverse effects None known.

SDS US PlumeStop®

# 13. Disposal considerations

**Disposal instructions** Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Dispose in accordance with all applicable regulations. Local disposal regulations

The waste code should be assigned in discussion between the user, the producer and the waste Hazardous waste code

disposal company.

Waste from residues / unused

products

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see:

Disposal instructions).

Empty containers should be taken to an approved waste handling site for recycling or disposal. Contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is

emptied.

### 14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

**IMDG** 

Not regulated as dangerous goods.

Transport in bulk according to Not established. Annex II of MARPOL 73/78 and

the IBC Code

# 15. Regulatory information

**US federal regulations** 

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)** 

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed

SARA 311/312 Hazardous Nο

chemical

SARA 313 (TRI reporting)

Not regulated.

# Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act Not regulated.

(SDWA)

923801

US state regulations

**US. Massachusetts RTK - Substance List** 

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Colloidal activated carbon ≤2.5 µm (CAS 7440-44-0)

Version #: 03 Revision date: 19-November-2017

PlumeStop® SDS US 5/6

Issue date: 26-February-2015

### **California Proposition 65**

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

### **International Inventories**

| Country(s) or region | Inventory name   | On inventory (yes/no)* |
|----------------------|--|------------------------|
| Australia            | Australian Inventory of Chemical Substances (AICS)                     | Yes                    |
| Canada               | Domestic Substances List (DSL)   | Yes                    |
| Canada               | Non-Domestic Substances List (NDSL)                                    | No                     |
| China                | Inventory of Existing Chemical Substances in China (IECSC)             | Yes                    |
| Europe               | European Inventory of Existing Commercial Chemical Substances (EINECS) | No                     |
| Europe               | European List of Notified Chemical Substances (ELINCS)                 | No                     |
| Japan                | Inventory of Existing and New Chemical Substances (ENCS)               | Yes                    |
| Korea                | Existing Chemicals List (ECL)  | Yes                    |
| New Zealand          | New Zealand Inventory  | Yes                    |
| Philippines          | Philippine Inventory of Chemicals and Chemical Substances (PICCS)      | Yes                    |

<sup>\*</sup>A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

Taiwan Chemical Substance Inventory (TCSI)

Toxic Substances Control Act (TSCA) Inventory

## 16. Other information, including date of preparation or last revision

**Issue date** 26-February-2015 **Revision date** 19-November-2017

Version # 03

United States & Puerto Rico

Further information HMIS® is a registered trade and service mark of the American Coatings Association (ACA).

**HMIS**® ratings Health: 0

Flammability: 0 Physical hazard: 0

NFPA ratings

Taiwan



**List of abbreviations** CAS: Chemical Abstract Service.

ECHA: European Chemical Agency.

IATA: International Air Transport Association.

IBC: Intermediate Bulk Container.

IMDG: International Maritime Dangerous Goods.

MARPOL: International Convention for the Prevention of Pollution From Ships.

PBT: Persistent, bioaccumulative, toxic.

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.

vPvB: very Persistent, very Bioaccumulative.

**References** ECHA registered substances database

**Disclaimer** Regenesis cannot anticipate all conditions under which this information and its product, or the

products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the

sheet was written based on the best knowledge and experience currently available.

PlumeStop® SDS US

923801 Version #: 03 Revision date: 19-November-2017 Issue date: 26-February-2015

Yes

Yes

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

# Appendix H

**Key Personnel Resumes** 

Remedial Action Work Plan NYSDEC BCP #C241254

# KEVIN KLEAKA, P.G.

Executive Vice President/Senior Environmental Scientist

### **EDUCATION**

### State University of New York at Plattsburg,

Bachelor of Science in Environmental Science, 1995 Applied Environmental Science Program

### **EXPERIENCE**

**IMPACT ENVIRONMENTAL CLOSURES Inc.,** 1997-Present), *Executive Vice President, Senior Environmental Scientist* 

- Principally responsible for managing environmental assessment, investigation, construction and remediation projects in commercial and industrial markets for lenders, real estate investment/development firms, construction firms and government agencies.
- Manage Phase I and II Environmental Site Assessments, State Spill Investigation and Remediation, County and Federal Underground Injection Control Programs, State & City Voluntary/Brownfield Cleanup Programs, State & Federal Superfund Sites, Brownfield Environmental Restoration Programs, Federal RCRA Closure, City E-Designation Projects.
- Responsible for environmental compliance of construction projects for waste management.
- Quality control of work products and deliverables.
- Supervise staff of geologists, hydrogeologists, engineers, environmental scientists, and environmental technicians to develop and implement sampling and analysis plans, quality assurance programs, remedial action plans.
- Provide expert witness testimony/fact statements and support in litigation cases involving soil, air and/or groundwater pollution.

**WYETH AYERST LABORATORIES**, (1995-1997), Chemist worked in chromatographic separations division performing quality assurance analysis.

 Performed laboratory procedures and analyses in accordance with USFDA analytical test methods by liquid, gas, and thin layer chromatography.

### **KEY PROJECTS**

- East Side Access MTA LIRR
- Melody Cleaners
- · ExxonMobil Spill- Valley Stream, NY
- Spartan Petroleum
- JFK 1020, Runway 13R-31L
- Rheingold Brewery Redevelopment Project
- WTC Greenwich Street Corridor Reconstruction
- · Yankee Stadium Macomb's Park

### **ORGANIZATIONS**

- New York City Brownfield Partnership
- New Partners for Community Revitalization
- ASTM Committee
- National Groundwater Association
- · Environmental Bankers Association
- · Vapor Intrusion Network
- Long Island Geologist Association
- Environmental Consulting Professionals
- Environmental Insurance Professionals

- Licensed Profession Geologist (NYS# 000735)
- Gold Certified Brownfield Professional 2012
- Advanced Tools for In-Situ Remediation Workshop
- ASTM Technical & Professional Training for Assessment of Vapor Intrusion into Structures of Property & New York State Department of Health, Vapor Intrusion Training
- New York Precision Equipment Global Survey Positioning Training
- MTBE & TBA Comprehensive Site Assessment and Successful Groundwater Remediation
- Environmental Data Resources, Due Diligence Workshop
- Advanced Technologies for Accelerated Natural Attenuation
- Eophysical Survey Systems, Theory and Practice of Applying Subsurface Interface Radar in Engineering and Geophysical Investigation.
- 40-Hour Occupational Safety & Health Administration

# **GREG MENDEZ-CHICAS**

SENIOR PROJECT MANAGER



### **EDUCATION**

Bachelor of Science, Environmental Science, SUNY at Plattsburgh (2007)

### **EXPERIENCE**

IMPACT ENVIRONMENTAL, 2009-Present, Senior Project Manager

- Direct and supervise staff of geologists, hydrogeologists, and environmental engineers in development and implementation of environmental assessments, investigations, construction and remediation projects in commercial and industrial markets for lenders, real estate investment/development firms, construction firms and government agencies.
- · Provide regulatory and technical guidance and strategy
- Manage Phase I and Phase II assessments, State Spill
  Investigation and Remediation, County and Federal
  Underground Injection Control Programs, State & City
  Voluntary/Brownfield Cleanup Programs, State & Federal
  Superfund Sites, Brownfield Environmental Restoration
  Programs, Federal RCRA Closure, City E-Designation Projects.
- Quality control of project budgets, efficiencies, and profitability
- Maintain key relationships with existing clients, and cultivate the development of new business and growth.

### APEX COMPANIES, 2007-2009, Environmental Scientist

- Prepared Phase I Environmental Assessments (ESAs) in general conformation with ASTM Practice E-1527-05 and USEPA ALL Appropriate Inquiries (AAI).
- Performed various aspects of Phase II scopes of work for commercial and industrial properties.
- Conducted microbiological sampling/investigations at a medical equipment manufacturing facility
- Preparation and implementation of sub-slab soil vapor sampling plans at former utilized gasoline and/or dry cleaning operations.

### **KEY PROJECTS**

- LIRR/MTA East Side Access (five contracts)
- Briarcliff Manor
- Saint Barnabas Hospital Expansion

- OSHA 40-hour HAZWOPER Training
- OSHA 8-hour Refresher (2007-to-present)
- OSHA 10-hour Construction Training (2016)
- New York State Licensed Asbestos Inspector (2007-to-present)
- NYSDEC Erosion & Sediment Control Training (2016)
- Amtrak (2016) & LIRR Roadway Safety Training (2017)
- New York City Office of Environmental Remediation – Certified Brownfield Professional (Silver Certification)
- Princeton Groundwater, Inc., The Groundwater Pollution and Hydrology Course (2021)
- Rutgers' Office of Continued Professional Education, Principles of Vapor Mitigation Design and Installation (2021)

# CHRISTOPHER CONNOLLY

PROJECT MANAGER

### **EDUCATION**

Bachelor of Science, Music Technology and Studio Systems Design - University of Derby, England (2008)

### **EXPERIENCE**

### IMPACT ENVIRONMENTAL-Project Manager, 2015-Present

- Conducts visual inspections and produces Phase I Environmental Site Assessments.
- Arranges, organizes, and oversees Phase II Environmental Site Assessments and Limited Subsurface Investigations.
- Arranges and oversees small, moderate and large-scale remediation projects, including communication with disposal facilities, subcontractors, Clients and regulatory agencies, as applicable.
- Produces Work Plans, Final Engineering Reports and other associated regulatory reports.
- Conducts various methods of soil and groundwater sampling, groundwater monitoring, well purging & sampling, and soil vapor sampling.

# **LAUREL ENVIRONMENTAL ASSOCIATES** - Environmental Scientist, 2010-2015

- Conducts visual inspections of Phase I & II Environmental Site Assessments.
- Writes Transaction screen and Phase I, II, and III
   Environmental Site Assessments, Remedial Action Work Plans
   (RIWP), Environmental Assessment Statements (EAS) and
   Supplemental Studies reports, as well as New York City Office
   of Environmental Remediation Voluntary Cleanup Program
   Reports.
- Assists in Phase II site operations.
- Organizes, arranges logistics, and oversees small to large scale remediation projects, with accurate communication with disposal facility, trucking, developer and regulatory agency required. Conducts associated CAMP monitoring and writes Daily Reports.
- Conducts various methods of soil and groundwater sampling, groundwater monitoring, well purging & sampling, and soil vapor sampling.
- Experience operating and assisting with truck-mounted,track-mounted and portable Geoprobe® machines and tooling.
- Conducts ground penetrating radar, magnetic and utility surveys.
- Completed OSHA 24-Hour HAZWOPER Training program.
- Conducts Nuisance Noise and Excessive Vibration monitoring assessments.
- Project manages numerous NYC OER Voluntary Cleanup Projects, dealing with the remediation and continuing use of Brownfields sites.

### **KEY PROJECTS**

- RCRA Closure projects, activities and reports.
- CEQR EAS Reports, OER Work Plans, OER Final Engineering Reports.
- Gasoline Station Portfolio Phase I and II ESAs

- OSHA 40-hour HAZWOPER Training
- OSHA 8-hour Refresher (2007-to-present)
- OSHA 10-hour Construction Training (2016)

# **DANIEL FRUHAUF**

Associate Project Manager



### **EDUCATION**

Bachelor of Arts, Ecosystems & Human Impact. SUNY at Stony Brook (2012)

### **EXPERIENCE**

2014-Present IMPACT ENVIRONMENTAL Associate Project Manager

- Responsible for management and logistical coordination of investigative and remedial tasks, schedule and implementation quality on very large to small clean-up projects within NYC, Long Island, NY and East Chicago, Indiana
- Developed and prepared various environmental planning documents approved by regulators including, Remedial Action Work Plans, Corrective Measures Implementation Work Plan, Health and Safety Plans, Waste Characterization Work Plans, Community Air Monitoring Plans, Phase II ESA Work Plans, Underground Storage Tank Removal Work Plan, etc.
- Responsible for developing complex methods of tracking and incorporating innovative technology to measure remedial completion for adequate reporting purposes
- Assembled proposals, work orders, change orders and general contracts for multiple clients
- Performed complex Phase II Assessments and other Subsurface Investigations to detect and target specific contaminants for delineation purposes.
- Designed and constructed various remedial systems including sub-slab depressurization systems, soil vapor extraction systems.
- Conducted, presented and attended multiple regulator meetings with USEPA, NYSDEC, NYC OER.
- Provided a professional attitude of always learning, exploring new methods and teaching along the way

### 2013-2014 SOVEREIGN CONSULTING Inc. Environmental Scientist

- Collected field data, soil, groundwater samples from various NYSDEC regulated Spill Sites and other hazardous waste sites
- Assisted in construction and design of SVE, SSDS and product skim systems at multiple tri-state clean-up projects
- Prepared various reporting components specific to NYSDEC Quarterly Monitoring Reports, Phase I ESA, Phase II ESA and owner liability risk assessments
- Provided contractor oversight and split sampling with multiple environmental contractors on various clean-up and development projects
- Engaged in various meetings with regulators as to develop cleanup strategies for complex projects

## **KEY PROJECTS**

- Former Du Pont East Chicago Facility RCRA CA Clean-up Project, East Chicago, IN
- Independent Metal Strapping NYSDEC/RCRA Closure, Roslyn, NY
- Multiple MTA/ LIRR Development Projects NYC, LI NY
- Saint Barnabas Hospital Development Project – Bronx NY
- Multiple NYC OER regulated Commercial Development Projects - NYC

- HAZWOPER 40hr + 8hr Refreshers
- OSHA 10hr Construction Safety
- OSHA 30hr Construction Safety
- Transportation Worker Identification Card (TWIC)
- NYC Office of Environmental Remediation (OER) Trained
- MTA/Amtrak Track Safety
- MTA/NYC Transit Track Safety
- · LIRR Safety Blue Card
- NYSDEC SWPPP Certified Inspector
- · Certified NYSDOL Asbestos Inspector

# XIN YUAN, P.E.

**Quality Control Manager** 



### **EDUCATION**

Masters of Science, Civil Engineering, UMass Amherst (2010)

Bachelor of Science, Environmental Engineering. Tsinghua University, Beijing, China (2008)

### **EXPERIENCE**

# 2010-Present **IMPACT ENVIRONMENTAL** *Quality Control Manager (2015-present) Environmental Analyst (2010-2015)*

- Quality control of all waste management/brownfield redevelopment projects;
- · Management of site remediation/waste management projects;
- Environmental compliance & permitting of waste management facilities
- Achieve and maintain appropriate and consistent application of environmental compliance for waste disposal/beneficial use facilities
- Achieve and maintain appropriate and consistent application of environmental compliance at the regional Levels for waste management projects
- Review & evaluate site investigation/waste characterization results for waste management projects and provide technical recommendations to project manager
- Authored a multitude of BUD petitions for various other solid waste related projects in NY,NJ &PA, including projects such as The East Side Access, The Air Rail Project and JFK International Jet Blue Terminal 5
- Design and perform waste characterization investigations for waste management projects

### **KEY PROJECTS**

- Columbia University Manhattanville Development Project
- LIRR 3rd Track Expansion Project
- · Atlas Quarry Reclamation Project
- Former New Jersey Zinc Company-West Plant Remediation Project
- · Morris Blanchard Redevelopment Project
- Brooklyn Bridge Park Pier 1 Redevelopment Project
- Southwest Brooklyn Marine Transfer Station Redevelopment Project
- · Doremus Avenue Redevelopment Project

# **CERTIFICATIONS/ ACHIEVEMENTS**

- Long Island Association of Professional Geologists
- American Chinese Real Estate Society

- US EPA 40hr Hazardous Materials Response for First Responders Training
- Professional Engineer in MA, PA, ID, NJ & NY

# JULIANA DE LA FUENTE, P.G.

SENIOR PROJECT MANAGER

### **EDUCATION**

Bachelor of Science, Environmental Science- Geology Concentration Long Island University, Southampton College (1985)

### **EXPERIENCE**

IMPACT ENVIRONMENTAL, 2013-Present, Senior Project Manager

- Manage a portfolio of remediation projects in the metropolitan New York City and Long Island regions.
- Responsible for managing Phase I and II Environmental Site
  Assessments, Site characterization and remedial investigations,
  soil vapor investigation, construction and remediation projects in
  commercial and industrial markets for financial intuitions, retail
  gasoline property owners, attorneys, real estate investment and
  development firms, and construction firms.
- Also, manage underground storage tanks removals, State Spill Investigation and Remediation Sites, County and Federal Underground Injection Control Program Sites, New York City Voluntary/Brownfield Cleanup Program Sites, NYSDEC Brownfield Environmental Restoration Program Sites, NYSDEC RCRA Closure Sites, New York City E-Designation Projects.
- Supervise staff of geologists, hydrogeologists, engineers, environmental scientists, and environmental technicians to develop and implement sampling and analysis plans, quality assurance programs, remedial action plans.

# Kleinfelder East, Inc., 2006-2013, Project Manager

- Effectively execute environmental investigation and remediation
  work in support of a multi-million-dollar national contract with
  focus on risk management for activities such as drilling,
  construction associated with remediation system installation,
  demolition, trenching and excavation, underground storage tank
  removal, sheeting/shoring installation, dewatering systems,
  mobile crane work activities and waste management.
- Policy and procedure implementation in accordance with client's operation integrity management system and Loss Prevention System (LPS) requirements.
- Established strong and sustainable relationships with regulatory agency representatives and reached milestones negotiated on behalf of the client with the regulator that have resulted in no further action and site closures.
- Team leader with direct reports responsible for the implementation of health and safety/LPS and technical training, mentorship, goal setting and performance evaluations, and team building.

1991-2006 Experience as a Project Manager within the South and Eastern US.

#### **KEY PROJECTS**

- Bill Wolf Petroleum
- · Spartan Petroleum
- Atlantis Management Group
- Gateway Development Group
- · Extell Development Company
- Xenolith Partners
- Lab Corp
- AutoZone

#### **ORGANIZATIONS**

- · National Groundwater Association
- Long Island Geologist Association

- New York City Office of Environmental Remediation – Certified Brownfield Professional (Gold Certification)
- ISO 14001:2004 8 Hour Training Certification
- Loss Prevention System<sup>™</sup> Training
- 40-Hour Hazardous Waste Site Worker Course/Refresher
- · CPR and First Aid certification
- · RCRA and DOT Training
- The Ninth Annual Indoor Air Pollution Conference Seminars
- U.S. EPA and ASHRAE Orientation to Indoor Air Quality
- Licensed Profession Geologist (NYS# 000790)

# Alex Keenan

Project Geologist I



### **EDUCATION**

Bachelor of Science, Geology, Virginia Polytechnic and State University (2014)

### **EXPERIENCE**

### IMPACT ENVIRONMENTAL, 2019-Present, Project Geologist

- Prepare Phase I & II Environmental Assessments (ESAs) in general conformation with ASTM Practice E-1527-05 and USEPA ALL Appropriate Inquiries (AAI).
- Perform various aspects of Phase II scopes of work for commercial properties.
- Prepare RIR/RAR reports for various NYSDEC OER projects.

# PREFERRED ENVIRONMENTAL SERVICES, 2017-2019, Geologist II

- Prepared Cause & Origin Investigation reports for insurance claim determinations.
- Performed various aspects of Phase II scopes of work for residential and commercial properties.
- Oversight of residential spill remediations with NYSDEC oversight.

# 6 wars

## **ADVANCED CLEANUP TECHNOLOGIES, 2016-2017, Env. Scientist**

- Prepared Phase I & II Environmental Assessments (ESAs) in general conformation with ASTM Practice E-1527-05 and USEPA ALL Appropriate Inquiries (AAI).
- Prepared RIR reports for various NYSDEC OER projects.
- Performed various aspects of Phase II scopes of work for commercial properties.

# **SUNBURST CONSULTING,** 2014-2015, Wellsite Geologist and Geosteering Consultant

- ND/MT based wellsite geologist responsible for geosteering Middle Bakken and Three Forks (1<sup>st</sup> and 2<sup>nd</sup> Bench) wells using TerraVu and excel programs.
- Gas Chromatography

### **KEY PROJECTS**

- LIRR/MTA 3<sup>rd</sup> Rail Project
- MTA Bus Depot Sludge Sampling 5 boroughs

- OSHA 40-hour HAZWOPER Training
- OSHA 8-hour Refresher (2016-to-present)
- OSHA 30-hour Construction Training (2019)
- Staten Island & LIRR Roadway Safety Training (2019)

# RESUME CHRISTINA RINK-ASHDOWN

# **EDUCATION**

BS Biology, 2006 University of California, San Diego

### PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc. Inorganic Chemist 2009 to present

Enviromatrix Analytical, Inc. Metals Chemist 2007 to 2009

### REPRESENTATIVE EXPERIENCE

Ms. Rink-Ashdown has over 13 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the trace metals, radiochemistry, and wet chemistry areas for major Federal and commercial projects. Her laboratory experience includes hands-on CLP and SW-846 ICP/CVAA analysis and overall technical review of data deliverables. Specifically, Ms. Rink-Ashdown has over 6 years inorganic and radiochemistry data validation experience using USEPA (including Region III) functional guidelines and other applicable documents.

As chemist with LDC, Ms. Rink-Ashdown specializes in the data validation of trace metals, wet chemistry, methyl mercury and radiochemistry analyses using USEPA functional guidelines or equivalent protocol. She has worked under various CERCLA and EPA data validation guidelines for the various CERCLA, Navy, Army Corps, AFCEE/AFCEC and commercial projects. She is certified as a "Radiometric Data Validation Specialist" through course work and testing by the Radiochemistry Society. Ms. Rink-Ashdown has validated over 2,000 samples for various isotopes in the last two years.

Ms. Rink-Ashdown has over 2 years of environmental laboratory experience in a laboratory performing the analyses of inorganic parameters.

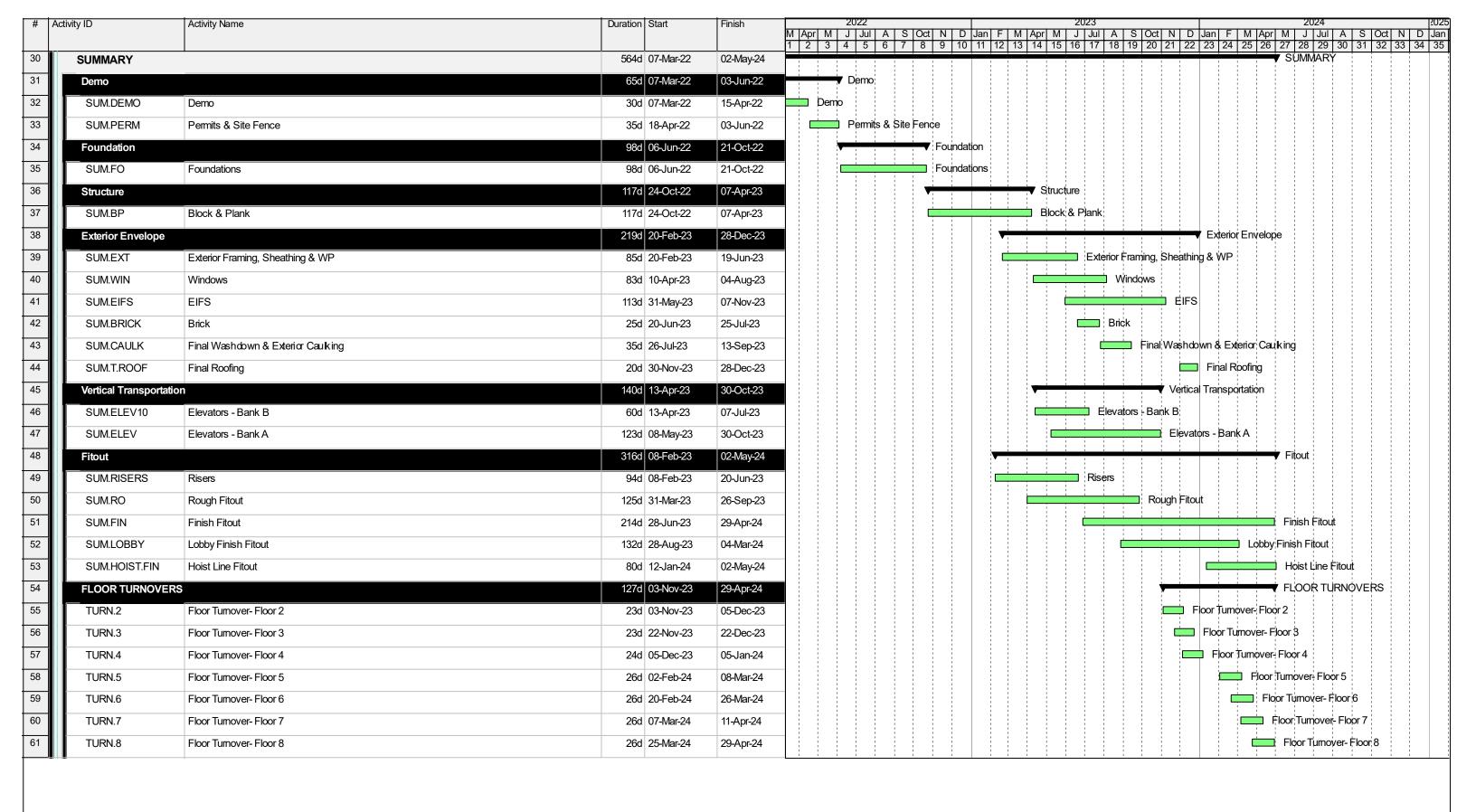
As lead inorganic chemist at Enviromatrix Analytical, Inc., Ms. Rink-Ashdown managed the inorganic chemistry section which performed techniques such as atomic absorption and inductively coupled argon plasma spectrometry. These analyses were performed from methods referenced in EPA CLP, SW-846, and Standard Methods documents.

# Appendix I

**Project Construction Schedule** 

Remedial Action Work Plan NYSDEC BCP #C241254





Data Date: 07-Mar-22 Run Date: 10-Jan-22

Page 2 of 2

**BEACH CHANNEL DRIVE - Live** 

Schedule 10-Jan-22



# Appendix J

NYSDEC Request to Import/

Reuse Fill or Soil Form

Remedial Action Work Plan NYSDEC BCP #C241254



# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION



# Request to Import/Reuse Fill or Soil

\*This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.\*

## SECTION 1 – SITE BACKGROUND

The allowable site use is:

Have Ecological Resources been identified?

Is this soil originating from the site?

How many cubic yards of soil will be imported/reused?

If greater than 1000 cubic yards will be imported, enter volume to be imported:

## SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone?

Does it contain less than 10%, by weight, material that would pass a size 80 sieve?

Is this virgin material from a permitted mine or quarry?

Is this material recycled concrete or brick from a DEC registered processing facility?

### **SECTION 3 - SAMPLING**

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

| SECTION 3 CONT'D - SAMPLING  |  |  |  |
|--|--|--|--|
| Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5): |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.                  |  |  |  |
| If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.     |  |  |  |
|  |  |  |  |
| SECTION 4 – SOURCE OF FILL   |  |  |  |
| Name of person providing fill and relationship to the source:  |  |  |  |
|  |  |  |  |
| Location where fill was obtained:  |  |  |  |
|  |  |  |  |
| Identification of any state or local approvals as a fill source:   |  |  |  |
|  |  |  |  |
| If no approvals are available, provide a brief history of the use of the property that is the fill source:           |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Provide a list of supporting documentation included with this request:   |  |  |  |
|  |  |  |  |
|  |  |  |  |

| The information provided on this form is acc | urate and complete. |
|--|---------------------|
| Signature                                    | Date                |
| Print Name                                   |                     |
| <br>Firm                                     |                     |