FINAL REMEDIAL DESIGN REPORT
FORMER WEST 45TH STREET GAS WORKS SITE:
OPERABLE UNIT 2
MANHATTAN, NEW YORK

Prepared for:

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Certification

"I, Daniel Martoccia (of Parsons Main of New York, Inc.), certify that I am currently a New York State registered professional engineer and that this Remedial Design Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and DER Green Remediation (DER-31) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications."



4/15/26

Engineer's Seal

Date

PARSONS

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ACRONYMS

Acronym	Definition / Description
3D	3-dimensional
ADA	Americans with Disabilities Act
AMSL	Above Mean Sea Level
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
CHASP	Contractor Health and Safety Plan
cm/s	centimeter/centimeters per second
Con Edison	Consolidated Edison Company of New York, Inc.
CP	Construction Plan
CPM	Construction Project Manager
CQAP	Construction Quality Assurance Plan
CQC	Construction Quality Control
CSP	Construction Stormwater Permit
CWP	Construction Work Plan
DER	Division of Environmental Remediation
DER-10	DER Technical Guidance for Site Investigation and Remediation
DER-31	DER Technical Guidance for Green Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
DSR	Data Summary Report
EC	engineering control
ESC	Erosion and Sediment Control
FER	Final Engineering Report
GGBFS	ground granulated blast furnace slag
HWP	Highway Work Permit
IC	institutional control
IECP	Institutional and Engineering Controls Plan
ISS	in-situ stabilization/solidification
IWP	ISS Work Plan
LEAF	Leaching Environmental Assessment Framework
LTTD	Low Temperature Thermal Desorption
µg/L	micrograms per liter
MGP	Manufactured Gas Plant
MP	Monitoring Plan
NAPL	Non-Aqueous Phase Liquid
NYCRR	New York Code of Rules and Regulations
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings

Acronym	Definition / Description
NYCDOH	New York City Department of Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Administration
OU-1	Operable Unit 1
OU-2	Operable Unit 2
PAH	polycyclic aromatic hydrocarbon
Parsons	Parsons Corporation
PDI	Pre-Design Investigation
PE	Professional Engineer
PLS	Professional Land Surveyor
psi	pounds per square inch
PPE	Personal Protective Equipment
RAOs	Remedial Action Objectives
RDR	Remedial Design Report
RDWP	Remedial Design Work Plan
RFI	Request for Information
RI	Remedial Investigation
RQD	Rock Quality Designation
SCGs	Standards, Criteria, and Guidance
SCOs	Soil Cleanup Objectives
SCR	Site Characterization Report
Site	Former West 45th Street Gas Works Site
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SPDI	Supplemental Pre-Design Investigation
SPLP	Synthetic Precipitation Leaching Procedure
SPT	Standard Penetration Test
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
UCS	Unconfined Compressive Strength
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
U&O	Use and Occupancy
VOC	volatile organic compound
WTS	Water Treatment System

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1.0 INTRODUCTION

This Remedial Design Report (RDR) has been prepared to support the implementation of the New York State Department of Environmental Conservation (NYSDEC) – selected remedy for Operable Unit 2 (OU-2) (the "Site") of the Consolidated Edison Company of New York, Inc. (Con Edison) Former West 45th Street Gas Works Site located in the borough of Manhattan, in New York City, New York (**Figure 1**). The selected remedy to address environmental impacts at OU-2 is presented in the July 2021 Decision Document (NYSDEC 2021).

This remedial design has been prepared by Parsons Corporation (Parsons), on behalf of Con Edison, and in accordance with the following documents:

- July 2021 Decision Document,
- NYSDEC Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC 2010a),
- NYSDEC DER Green Remediation (DER-31) (NYSDEC 2010b), and
- Applicable provisions of the NYSDEC Law and associated regulations, including Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 375-6 (6 NYCRR Part 375-6).

Activities identified in this Remedial Design will be performed under the approval and oversight of NYSDEC and the New York State Department of Health (NYSDOH).

This RDR, the associated Design Drawings (**Appendix A**), Technical Specifications (**Appendix B**), and supporting documents are collectively referred to hereafter as the Contract Documents.

1.1 Background Information

1.1.1 Site Location and Historic Usage

The Former West 45th Street Gas Works Site is located in Manhattan, New York, and occupies portions of Blocks 109 (Lot 7R and 17) and 1093 (Lot 9R) on the Manhattan Tax Map (**Figure 2**). The site is bounded by 46th Street to the north, 11th Avenue to the east, 44th Street to the south, and 12th Avenue (aka Route 9A and the Henry Hudson Highway) to the west, as shown in **Figure 2**. For characterization purposes, the Former West 45th Street Gas Works Site was divided into two distinct areas designated as Operable Unit – 1 (OU-1) and OU-2, as shown in **Figure 2**. This RDR is specific to the OU-2 portion of the West 45th Street Gas Works Site (the "Site"). The Site is zoned industrial and is located in Tax Block 1093 Lot 9R, containing a parking area and pedestrian bridge associated with the Intrepid Sea, Air, and Space Museum.

Former manufactured gas plant (MGP) structures located on Site include two gasholders, associated structures, and a purifying house. Although most of the buildings and structures associated with the MGP facility have been removed, the subsurface remnants of the gasholders remain on Site. Remnants of the former underground structures and former underground storage tanks (USTs) are located in the southwestern corner of the Site (Site Characterization Work Plan [AKRF and Parsons 2003]). The existing Site conditions and approximate locations of known former historic structures are presented on the Design Drawings (**Appendix A**).

1.1.2 Site Geology

Surface topography ranges from approximately 10 to 20 feet above mean sea level (AMSL) at the Site and slopes gently downward from north to south and from east to west. Subsurface soils consist of natural deposits mixed with historic fills associated with the development and expansion of the pre-existing shoreline out into the Hudson River to the west along much of

the Route 9A corridor. The overburden across the Site is generally classified as fill consisting of silts, sand, gravels, large cobbles, boulders, and other debris (e.g., brick, concrete, cement, metal, wood, etc.) which ranges from zero (0) to 41 feet thick. Remnants of the former gas holder walls and foundations, as well as other MGP-related subsurface structures and associated equipment are present at the Site, as evident during Preliminary Design Investigation (PDI) test pit and boring investigations.

The bedrock underlying the Site is the Manhattan Formation, composed of gray to black mica schist that has been intensely folded and deformed. Soil borings advanced during Site investigations encountered gneissic schist bedrock at significantly varying depths. Competent bedrock was encountered at depths ranging from approximately 8 to 60 feet below ground surface (bgs). During the 2003 Site Characterization investigation, borings collected in the vicinity of the large gas holder showed the bottom floor of the holder appears to be composed of a combination of concrete and bedrock. Bedrock was encountered along the perimeter of the holder at depths between elevations -10 to -20 feet AMSL. Based on information presented in the PDI Report (Parsons 2012), subsurface investigatory borings provide evidence some bedrock was removed to facilitate the construction of the large gasholder foundation wall; however, the depth of bedrock removal is not consistent across OU-2. A contour map depicting bedrock elevations noted from previous soil and test pit investigations conducted at the Site is provided on the Design Drawings (**Appendix A**). Additional information collected during initial investigations at the Site is presented in the Site Characterization Report (SCR) (Parsons 2003).

1.1.3 Site Groundwater and Hydrogeological Conditions

Groundwater monitoring and gauging events conducted at the Site indicate groundwater flow beneath the Site is to the west towards the Hudson River. Groundwater was encountered beneath the Site at elevations ranging from 3.36 feet AMSL on the west side of the Site to 11.59 feet in the center and north side of the Site. Although groundwater flow is generally toward the Hudson River, mounding effects and some artesian conditions have been observed within the footprint of the former large gasholder. Due to the varied fill material within and adjacent to the former large gasholder, anisotropic (directionally dependent) hydraulic properties are prevalent across OU-2. A map showing the groundwater elevation contour map for the Site is presented in the Design Drawings (**Appendix A**) and Groundwater Modeling results are provided in **Appendix C**.

1.2 Site Characterization

Several investigations have been conducted to assess Site conditions and determine the nature and extent of MGP-related impacts in soil, groundwater, and soil gas media. This section provides a summary of the Site investigations. The following list summarizes the chronology of previous Site investigations:

- Site Characterization in OU-2 (2003/2006),
- Pre-Design Investigation (PDI) in OU-2 (2012), and
- Supplemental PDI (SPDI) (2022).

1.2.1 Site Characterization and Pre-Design Investigations

A Remedial Investigation (RI) was conducted to characterize MGP-related impacts in soil, groundwater, and soil gas media at OU-2. These investigations included Site Characterization activities performed in 2003 and 2006, and the PDI conducted in 2012.

The following general activities were conducted during the RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment, and
- Ecological and Human Health Exposure Assessments.

The scope and comprehensive reporting of the data collected during these investigations are presented in the SCR (Parsons 2003), Data Summary Report (DSR, Parsons 2006), and PDI Summary Report (Parsons 2016). These documents are collectively referred to as the "RI" reports. Investigation results from the Site Characterizations (Parsons 2003, 2006) and PDI (Parsons 2012) activities are further discussed below.

Soil borings were advanced during the RI field activities. The RI boring logs provided in **Appendix D** contain details regarding debris and bedrock coring. Geotechnical data collected during the investigations is provided in the SCR (Parsons 2003) and the PDI Summary Report (Parsons 2016).

Analytical results collected during the RI revealed concentrations of volatile organic compounds (VOCs) (primarily benzene, toluene, ethylbenzene, and xylenes [BTEX]), semivolatile organic compounds (SVOCs) (primarily polycyclic aromatic hydrocarbons [PAHs]), and metals exceeding applicable NYSDEC guidelines for soil cleanup objectives and groundwater quality standards. The investigation also confirmed the presence of non-aqueous phase liquid (NAPL) throughout the Site and the localized presence of dense NAPL (DNAPL) in a monitoring well on the Site. A waste characterizations soil sample taken at PDI-3 between 7 and 9 feet and a groundwater sample taken at MW-5 resulted in Toxicity Characteristic Leaching Procedure (TCLP) benzene concentrations exceeding the regulatory limit of 500 micrograms per liter (µg/L) for hazardous waste classification. Results of the Bench-Scale Treatability Study and technical memorandums detailing the soil stabilization mass flux modeling for leachability previously provided to NYSDEC are discussed in Section 1.2.2.1 Bench-Scale Treatability Study.

1.2.2 Supplemental Pre-Design Investigation

A Remedial Design Work Plan (RDWP) was prepared and submitted to NYSDEC in January 2022 and approved in March 2022 (Parsons 2022). The RDWP summarized the activities to be completed as part of the Supplemental Pre-Design Investigation (SPDI)) conducted in September 2022. The SPDI was performed to further characterize the extent and nature of contaminated material on Site. The following SPDI activities were conducted to support the design:

- Groundwater modeling and subsurface hydraulic evaluation,
- Bench-scale treatability study for in-situ stabilization/solidification (ISS) implementation,
- A three-dimensional (3D) conceptual design model, and
- Structural evaluation of sensitive structures.

A RDWP Summary Report was prepared and submitted to NYSDEC in September 2023 and finalized in September of 2024 (Parsons 2024). The RDWP Summary Report summarized the

findings of the SPDI activities, the bench-scale treatability study, and groundwater modeling evaluation. The SPDI activities are discussed in further detail below.

1.2.2.1 Bench-Scale Treatability Study

A bench-scale treatability study was performed by Geo-Solutions (**Appendix E**) for ISS treatment of Site soils. The treatability study developed a series of mix designs using different reagents and ratios to assess the treatability and effectiveness of mixing NAPL-impacted Site soils with ISS amendments (e.g., Portland cement and ground granulated blast furnace slag [GGBFS]). Six discrete Site soil types and eight mix designs were represented in the treatability study.

The mix designs were evaluated for suitability versus the geotechnical criteria established by the United States Environmental Protection Agency (USEPA) (1989) for soil stabilization. Additionally, the performance requirements were consistent with those established in the Decision Document (NYSDEC 2021). The following geotechnical criteria are the minimum performance requirements for the ISS treatment:

- Hydraulic conductivity: less than 1 x 10^{-6} centimeters per second (cm/s)
- Unconfined compressive strength (UCS): greater than 50 pounds per square inch (psi)

Mass flux modeling was performed utilizing xylene, naphthalene, and benzene concentration data combined with hydraulic conductivity data measured during the treatability study. Mass flux modeling was not originally performed for benzene as the Synthetic Precipitation Leaching Procedure (SPLP) detections were below project specific action levels for groundwater. However, Leaching Environmental Assessment Framework (LEAF) 1315 (mass flux) testing was performed to include results for benzene, and as such, modeling was subsequently amended to include benzene. The technical memorandum dated July 20, 2023 and included in the RDWP Addendum detailing the mass flux modeling for xylene and naphthalene and the October 22, 2025 technical memorandum that was included with the responses to NYSDEC comments on the RDR detailing the mass flux modeling for benzene are included in **Appendix E**. Log-log plots that were generated based on the mass flux modeling demonstrate negative slopes of the mass flux over time for xylene, naphthalene, and benzene. This indicates that the mass flux, or the proportion of dissolved phase concentrations originating from the ISS formation and entering groundwater, will continue to decrease over time resulting in dissolved phased concentrations below applicable groundwater criteria.

Four mix designs were identified as acceptable for use at the Site based on achieving the target minimum geotechnical criteria. Mix designs 1, 2, 5, or 7, when combined with Site soil, satisfy the project performance requirements. Details on these specific mix designs are further discussed in the Bench-Scale ISS Treatability Study Report (**Appendix E**).

1.2.2.2 Groundwater Modeling

Groundwater modeling evaluated the potential alteration in groundwater flow direction, potential for upgradient mounding, and flow velocity following ISS implementation. The groundwater model was used to identify the potential for unexpected rise (i.e., mounding) in the water table and/or redirection of groundwater flow. Based on the results of the model, implementation of the ISS treatment will not significantly affect the general velocity of Site groundwater. The groundwater modeling was summarized in two separate memorandums. The first was submitted with the draft RDWP Summary Report in September 2023. The second follow-up memorandum was prepared to address comments provided by NYSDEC and was submitted in September 2024. Both NYSDEC approved documents are presented in **Appendix C**.

1.2.2.3 3D Conceptual Design Model

A 3D conceptual design model of the Site subsurface was developed based on information received during the PDI and SPDI field work. The 3D model depicts Site details such as the elevation of top of bedrock, subsurface debris and obstructions, excavation zones, jet grouting zones and the extrapolated bedrock contour of the Site. Additional detail regarding the 3D model, including still images and horizontal cross-sections of the model can be found in the RDWP Summary Report (Parsons 2024).

1.2.2.4 Structural Evaluation

A visual evaluation of existing above-grade structures around the Site was completed to identify areas that must be structurally monitored during remedial construction activities. Structures that were identified to require structural monitoring include the multi-story building adjacent to the northwest side of the Site and the pedestrian bridge located in the northwest corner of the Site. Additional details regarding the visual evaluation and photographs taken during the corresponding Site visit can be found in the RDWP Summary Report (Parsons 2024).

1.3 Remedial Goals and Remedial Action Objectives

1.3.1 Remedial Goal

The primary remedial goal for the areas of the Site affected by MGP-related impacts is to ensure that the MGP-related contamination does not present a threat to human health or the environment considering the manner in which the properties are used, and to develop and implement the necessary remedial actions to remediate the area to a level that is protective of human health and the environment for such uses.

1.3.2 Remedial Action Objectives

Remedial Action Objectives (RAOs) are media-specific objectives that achieve protection of public health and the environment. RAOs developed for the Site were established based on contaminated media, identified contaminants of concern, standards, criteria, and guidance (SCGs), and results of the exposure assessment. SCGs are promulgated requirements and non-promulgated guidance that guide site activities during investigation and remediation. The standards and criteria are set forth in federal or NYSDEC Law and are either directly applicable or relevant and appropriate to a contaminant, remedial action, location, or other circumstance. The RAOs were presented in the Decision Document (NYSDEC 2021) and are outlined below:

1.3.2.1 Soil

<u>RAOs for Public Health Protection</u>

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

<u>RAOs for Environmental Protection</u>

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

1.3.2.2 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

1.3.2.3 Soil Vapor

RAOs for Public Health Protection

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

1.4 Summary of the Remedial Action

According to the July 2021 Decision Document, the NYSDEC-selected remedy to address environmental impacts identified at the Site will consist of the following components:

- Excavation and off-site disposal of soils to approximately 5 feet bgs,
- ISS treatment of soils that exceed Commercial Use Soil Cleanup Objectives (SCOs) and/or NAPL-impacted soils from 5 feet to 30 feet bgs or bedrock in select areas,
- Installation of a Site cover system, and
- A Site Management Plan (SMP), including an Institutional and Engineering Controls Plan (IECP) and a Monitoring Plan (MP).

However, it was discussed with NYSDEC during the design phase that the Site groundwater table will likely be encountered within 5 feet bgs. For this reason, the pre-ISS excavation of overburden materials was reduced to a minimum depth of 3.5 feet. This approach greatly improves project sustainability in five primary ways:

- Reduction in the volume (and, as a result, the number vehicles utilized for transportation) of MGP-impacted overburden material excavated and disposed of off-site by up to 30 percent,
- Reduction in the amount of backfill material (and, as a result, the number vehicles utilized for transportation) required to be imported on-site by up to 30 percent,
- Reduction in the potential for encountering shallow groundwater which would require collection and treatment prior to discharge and/or disposal,
- Reduction in the potential for adverse impacts to adjacent structures and utilities, and
- Reduction in the total duration for the remedial construction.

The proposed approach of reducing the minimum pre-ISS excavation depth to 3.5 feet will provide sufficient containment for management of the ISS swell and is consistent with the Green Remediation principles outlined in DER-31. This pre-ISS excavation depth may be deeper depending on Site conditions during remedial construction and/or to meet the final

Site topography during restoration. Excavated materials will be transported off-site for disposal.

ISS treatment will be implemented on the remaining source materials. The ISS treatment zone will extend from approximately 3.5 feet bgs to up to 30 feet bgs or bedrock in the areas shown on the Design Drawings (**Appendix A**). The top of ISS treatment will be terminated at approximately 3.5 feet bgs.

A Site cover system will be installed over the ISS treatment area to prevent direct human exposure and permit commercial use of the Site. Backfill materials meeting the requirements of 6 NYCRR Part 375- 6.7(d) for Commercial Use will be imported to the Site to construct the Site cover system to the designed grades shown on the Design Drawings. The final surface restoration measures will consist of restoring the Site to pre-construction conditions (i.e., asphalt pavement, concrete, and other landscaping features). The Intrepid Pedestrian Bridge Record Drawings are provided in **Appendix F**. These drawings include details that will be used during the restoration process as they include as-built information related to Site features that will require removal to complete the remedy.

Following completion of the Site remedy, an SMP will be prepared for the impacts remaining on Site. The IECP will provide the procedures for maintaining Site ECs and ICs. The MP will provide the basis for conducting long-term monitoring activities at the Site.

1.5 Report Organization and Structure

In addition to this introductory section, this RDR is organized as follows:

- **Section 2.0 – Basis of Design**: Presents the regulatory requirements for the remedial design and the means for fulfilling these requirements, including the basis for the soil excavation design, ISS treatment design, and Site cover system design.
- **Section 3.0 – Organizational Structure and Responsibilities:** Presents the organizational structure, roles, and responsibilities for the project.
- **Section 4.0 – Permits and Approvals:** Presents the requirements for the federal and state permits, New York City Department of Environmental Protection (NYCDEP) Stormwater Construction Permit, local authorizations and permits, and Contractor pre-mobilization submittals.
- **Section 5.0 – Construction Activities**: Describes the monitoring well abandonment, survey control, structural surveys and monitoring, mobilization, Site preparation, environmental monitoring and controls, construction water management and treatment, demolition, soil excavation and excavation support, ISS treatment, material handling and management, decontamination, Site cover system, and demobilization.
- **Section 6.0 – Sustainability**: Describes the green construction practices to promote sustainability while conducting work.
- **Section 7.0 – Preliminary Project Schedule**: Presents the anticipated schedule for the remedial design, Contractor procurement, and implementation of the remedy.
- **Section 8.0 – Engineering Controls and Institutional Controls:** Describes the ECs and ICs that will be implemented as part of the remediation.
- **Section 9.0 – Post-Remediation Activities:** Describes the Final Engineering Report (FER) and SMP.
- **Section 10.0 – References:** Lists the literature cited and referenced within this document. This RDR is also supported by the appendices listed in the table of contents.

2.0 BASIS OF DESIGN

This section presents the basis for the key design components and includes the following:

- Debris and Obstructions – evaluation performed to document the observed debris and obstruction conditions based on soil borings,
- Excavation – basis for the limits of excavation, including excavation protection measures and provisions for removal activities conducted near installed construction,
- ISS Treatment – the design assumptions used to develop the ISS treatment approach and limits, and
- Site Cover System – the design assumptions used to develop the Site cover system.

Additionally, sustainability and green construction practices to implement during remedial construction are discussed in Section 6.

2.1 Debris and Obstructions

The former MGP structures at the Site included two gasholders, a purifying house, and other associated structures. As a result, subsurface obstructions related to the former MGP activities exist at the Site and at various depths. Additionally, historic fills of varying composition, such as rock, demolition debris, etc., were placed on-site. Large obstructions and debris remaining in the subsurface are expected to reduce efficiency during ISS treatment.

Soil borings and test pits that were advanced during the RI activities supported characterization of the Site subsurface with respect to debris and obstructions. A total of 63 soil borings within the Site were reviewed in order to summarize the observed subsurface findings, including soil stratification, standard penetration test (SPT) blow counts, rock quality designation (RQD) information, frequency and type of obstructions encountered, and evidence of hydrocarbon odor and/or NAPL encountered during drilling. Based on the soil boring analysis, seven cross-sections were developed to depict observed subsurface obstructions at the Site shown in the Design Drawings (**Appendix A**). It is recommended that these cross-sections are reviewed in conjunction with the soil boring log provided in **Appendix D.**

Obstructions may be encountered during soil excavation and/or ISS treatment. Any obstruction encountered during soil excavation that extends beyond the vertical limits of excavation will be documented and the location and limits of the obstruction surveyed. Any obstructions/debris encountered that are unable to be removed will be documented. Refer to the Construction Quality Assurance Plan (CQAP) (**Appendix G**) for measures to be taken when obstructions/debris are encountered.

2.2 Excavation

NYSDEC-selected remedy requires the removal of soils in areas identified for subsequent ISS treatment. The excavation area will form a working area to perform the ISS treatment and facilitate the management of ISS swell material that is generated as part of the ISS treatment process. The depth of excavation will be performed to a minimum of 3.5 feet bgs. The excavation depth coincides with the top of ISS termination elevation unless field conditions during remedial construction necessitate the need to excavate deeper and/or to meet final Site grades during restoration. Modification of the excavation depth from 5 feet bgs to 3.5 feet bgs was discussed in a phone conversation with NYSDEC on November 6, 2024, and NYSDEC concurrence provided via e-mail on November 6, 2026, pending acceptance of the technical justifications provided in Section 1.4. The modification of the excavation depth as discussed in Section 1.4 improves project sustainability via:

- Reduction in the volume (and, as a result, the number vehicles utilized for transportation) of MGP-impacted overburden material excavated and disposed of off-site by up to 30 percent,
- Reduction in the amount of backfill material (and, as a result, the number vehicles utilized for transportation) required to be imported on-site by up to 30 percent,
- Reduction in the potential for encountering shallow groundwater that would require collection and treatment prior to discharge and/or disposal,
- Reduction in the potential for adverse impacts to adjacent structures and utilities, and
- Reduction in the total duration for the remedial construction.

As shown on C-102 Excavation Plan in the Design Drawings, the limits of ISS extend laterally to a distance of 5-feet from the existing chain-link security fence, adjacent building foundation wall, and the existing pedestrian walkway structure. In order to implement the ISS remedy while being protective of existing structures, and to allow for continued safe access to the Intrepid Museum via the pedestrian walkway, this minimum 5-foot protective buffer (or offset) will be maintained between the horizontal limits of the ISS and the above-referenced structures. An off-set of 10 feet from the pedestrian walkway ramp entrance is specified to maintain Americans with Disabilities Act (ADA)-compliant access from the pedestrian walkway to West 46th Street during implementation of the remedy. Actual routing of pedestrian traffic in this area will be coordinated with key stakeholders.

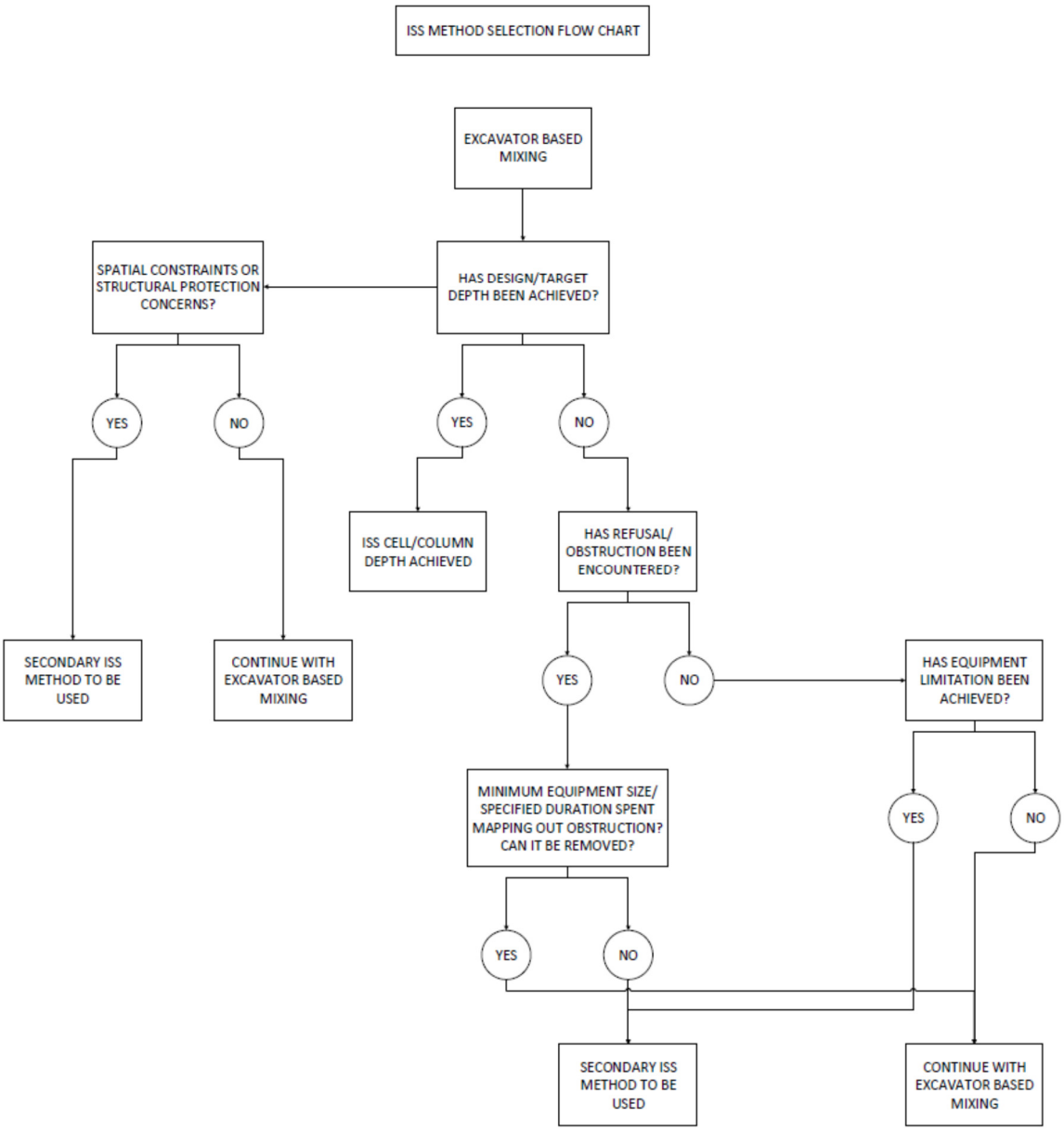
2.3 ISS Treatment

As approved by NYSDEC, the minimum pre-ISS excavation depth will be 3.5 feet bgs. The minimum pre-ISS excavation depth will provide sufficient containment for management of the ISS swell and is consistent with the Green Remediation principles outlined in DER-31. This pre-ISS excavation depth will provide sufficient thermal protection from seasonal freeze/thaw cycles and will provide an adequate corridor for future utilities. Excavation depths may be extended in the field depending on Site conditions during remedial construction and/or to meet the final Site topography during restoration.

The horizontal and vertical limits of ISS treatment are presented on Drawing C-103 in the Design Drawings (**Appendix A**) and are based on the evaluation of the nature and extent of NAPL conducted during the Site Characterization (Parsons 2003, 2006) and approved by NYSDEC, as detailed in the Decision Document (July 2021). The horizontal and vertical extents approved by NYSDEC address soils that were identified during investigation activities to contain MGP-related impacts (primarily in the form of NAPL-saturated soil). In isolated instances, NAPL was identified in select borings at or near the bedrock interface. Based on the discontinuous nature of NAPL-impacted soil identified near the bedrock surface, the potential for deeper instances of NAPL are isolated, and implementation of ISS within a 5-foot radius of identified NAPL near the bedrock surface is a conservative approach to addressing discontinuous and isolated pockets of NAPL. The deepest impacts detected in the vertical plane did not extend as far horizontally as the impacts detected in the shallower soils. For this reason, ISS treatment will be implemented in three distinct vertical zones from the bottom of excavated zone to 15 feet bgs, to 30 feet bgs, or to bedrock. In areas where ISS has been designed to terminate above bedrock (15 feet or 30 feet), ISS will be terminated at the design depths or at bedrock, whichever is encountered first.

Due to the complex subsurface conditions (e.g., bedrock surface contours, historic fill, debris, and obstructions) present at the Site, the means and methods for ISS treatment will be the responsibility of the selected Contractor and approved by the Engineer. However, an ISS

Method Selection Flow Chart has been included below for general reference and alignment with NYSDEC.



The selected Contractor will be responsible for preparing an ISS Work Plan (IWP) that describes the proposed means and methods for ISS treatment to be included as part of the overall project Construction Work Plan prepared in accordance with the Design Drawings (**Appendix A**), Technical Specifications (**Appendix B**), permits obtained, and all federal, local, and state requirements including but not limited to NYSDEC's In-Site Solidification QA/QC guidance provided to Con Edison via email on March 12, 2026. The Contractor will be responsible for performing a field demonstration ISS Test Section to demonstrate the effectiveness of the selected means and methods for ISS treatment.

2.4 Site Cover System

The NYSDEC-selected remedy requires a Site cover system to be installed following completion of the ISS treatment activities. A Site cover system is required to prevent human exposure to the contaminated soils stabilized within the ISS. Materials intended for reuse at the Site or proposed to be imported to the Site for use in the cover system will be submitted to NYSDEC for approval via NYSDEC's Request to Import/Reuse Fill or Soil Form. Imported materials used to construct the Site cover system will meet the applicable SCOs for commercial use set forth in 6 NYCRR Part 375-6.7(d). Final surface restorations will include concrete sidewalks and asphalt pavement, consistent with pre-construction conditions and the Intrepid Bridge Pedestrian Bridge Record Drawings in **Appendix F**.

3.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

NYSDEC will provide regulatory oversight for implementation of the Site remedy. Con Edison has the responsibility of implementing all remediation activities in accordance with this approved RDR. Parsons, as the Certifying Engineer, will provide design, engineering, and technical support services, as well as construction oversight, to ensure compliance with the RDR. NYSDEC, NYSDOH, and NYCDEP personnel are anticipated to be on-site periodically to observe work activities. Key project personnel are identified in **Table 3.1** below for Con Edison, NYSDEC, New York State Department of Transportation (NYSDOT), NYSDOH, and Parsons. The Contractor is to be determined.

Table 3.1 – Key Project Personnel

Name/Affiliation	Address	Contact Information
Con Edison		
Mr. Matthew Levinson Project Manager	31-01 20th Ave. Astoria, NY 11105	T: 201.249.2200 Levinson.M@coned.com
NYSDEC		
Ms. Greta Kowalski	625 Broadway Albany, NY 12233	T: 518.402-2029 Greta.Kowalski@dec.ny.gov
NYSDOT		
Ms. Kathleen Joy	50 Wolf Rd. Albany, NY 12232	T: 315.432.0943 Kathleen.Joy@dot.ny.gov
NYSDOH		
Mr. Anthony Perretta	Corning Tower Rm. 1787 Albany, NY 12237	T: 518.486.7186 beei@health.ny.gov
Certifying Engineer: Parsons		
Mr. Keith Parker Project Manager Mr. Dan Martoccia, PE Engineer of Record	100 High Street, Suite 1550 Boston, MA 02110 1011 US-22W, Suite 201 Bridgewater, NJ 08807	T: 978.604.1846 Keith.Parker@parsons.com T: 908.625.5376 Daniel.Martoccia@parsons.com

Minimum responsibilities of Con Edison, the Certifying Engineer, and the selected Contractor for work to be conducted prior to, during, and following implementation of the remedial activities at the project area are presented in the following subsections.

3.1 Con Edison Responsibilities

Con Edison will be responsible for the following:

- Coordinate with NYSDEC before, during, and after implementation of the remedial activities,

- Coordinate with the Certifying Engineer and selected Contractor (as necessary) to implement the required work activities in conformance with the approved RDR,
- Contract with the selected Contractor,
- Secure access agreements and coordinate with property owners (as needed) with respect to the implementation of the remediation activities,
- Provide a current list of approved waste haulers and waste disposal vendors for treatment/disposal of non-hazardous solid and liquid wastes to be generated as part of the remediation activities. Acting as the "Generator" for material resulting from the remediation activities for off-site transport and disposal of the waste,
- Delegate a Construction Project Manager (CPM) to serve as Con Edison's on-site representative. The CPM will be responsible for ensuring that construction is completed in accordance with the Contract Documents, and
- Conduct the Pre-Construction Meeting, Progress Meetings, Pre-Final Closeout Review Meeting, and a Construction Closeout Meeting for the remediation activities.

3.2 Certifying Engineer Responsibilities

The Certifying Engineer will provide the following services prior to and during implementation of the remediation activities:

- Assist Con Edison in preparing bid documents and evaluating bid proposals submitted by prospective Contractors,
- Coordinate with potential disposal facilities to verify waste characterization analytical requirements prior to the collection of waste characterization samples,
- Review Contractor submittals, requests for interpretation and clarification, and change orders and provide comments, if any, to the Contractor and Con Edison,
- Prepare requests for information (RFIs) from the Contractor,
- Issue Field Modification Forms (if necessary),
- Assist Con Edison in the review of Contractor invoices/requests for payment,
- Coordinate and support the CPM with the Pre-Construction Meeting, Progress Meetings, Pre-Final Closeout Review Meeting, and a Construction Closeout Meeting for the remediation activities,
- Prepare and submit to the CPM the Weekly Field Reports,
- Implement the requirements of the CQAP (**Appendix G**) to document that the remediation activities are conducted in general conformance with the Remedial Design and notifying Con Edison of any deviations,
- Conduct community air monitoring in accordance with the Community Air Monitoring Plan (CAMP) (**Appendix H**) and conduct soil and water characterization sampling, as needed,
- Provide Con Edison with support to resolve design-related issues that may arise when the remedial construction activities are implemented, and
- Prepare (and certify) an FER at the conclusion of the remediation work to document completion of the construction activities.

3.3 Contractor Responsibilities

The Contractor is responsible for providing all supervision, labor, equipment, and materials needed (unless otherwise noted) to implement the activities described in the RDR. Contractor responsibilities are detailed throughout the Contract Documents, including the Design Drawings (**Appendix A**) and Technical Specifications (**Appendix B**). Contractor's responsibilities also include:

- Obtain all required permits to perform the remediation,
- Adhere to all Contract Documents, which will include submittals to the Certifying Engineer and Con Edison,
- Prepare waste profiles for off-site treatment/disposal of solid and liquid wastes to be generated as part of the remediation activities,
- Prepare and sign (as an authorized agent for Site Owner as directed) waste manifests/bills of lading for shipments of waste materials generated by the remediation activities,
- Maintain records of labor, materials, and equipment utilized for the remediation activities and any unusual circumstances, if any are encountered,
- Implement the requirements of the CQAP (**Appendix G**) and the Quality Control section of the Technical Specifications (**Appendix B**) to ensure that the remediation activities are conducted in general conformance with the Contract Documents. Notify the Certifying Engineer and Con Edison of any deviations,
- Maintain lines of communication with the CPM and Certifying Engineer,
- Prepare and submit to the Certifying Engineer and CPM the daily field reports and the monthly progress reports,
- Verify all existing Site conditions,
- Review and comply with Con Edison's Contractor Safety Requirements (latest edition),
- Maintain a continuous record of approved field change modifications, and
- Notify the Certifying Engineer and Con Edison immediately upon discovery of a conflict between the contract documents and actual Site conditions.

4.0 PERMITS AND APPROVALS

Based on the remedial construction activities proposed for the Site and currently available information, the authorizations, permits, and/or notifications outlined below have been identified, at a minimum, as potentially applicable for the remediation activities.

4.1 Federal and State Permits

No federal permits are anticipated for the remedial action.

As specified in Section 1.10 and Appendix 1C of NYSDEC DER-10, NYSDEC may grant exemption from certain permits and other authorizations issued by New York State and local agencies required for completion of this remedial action, provided the substantive requirements of the permit programs are followed. Since the area of disturbance associated with the Site will be less than 1 acre, an NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from construction activities is not anticipated be required. However, NYSDEC best management practices (BMPs) for sediment and erosion control and requirements detailed in Chapter 19 of Title 15 of the Rules of the City of New York will be followed.

The Site is located on an NYSDOT-owned parcel, and access into and out of the Site will require operation within the limits of NYSDOT right-of-way. A Use and Occupancy (U&O) Permit and a Highway Work Permit (HWP) for non-utility work will be required. The U&O permit will be obtained by the Certifying Engineer prior to mobilization to the Site. The selected Contractor will be responsible for obtaining the required HWP.

No additional state permits are anticipated to complete the work.

4.2 Local Authorizations and Permits

Since the total ground disturbance is greater than 20,000 square feet, a Construction Stormwater Permit (CSP) issued by NYCDEP will be required in accordance with Chapter 19.1 of Title 15 of the Rules of the City of New York. This permit will be obtained by the Certifying Engineer prior to the start of intrusive activities at the Site.

The selected Contractor will be responsible for the discharge of construction waters to public sewers, in accordance with Chapter 19 of Title 15 of the Rules of the City of New York (to include any resultant federal and state regulatory requirements), as needed.

The remedial action will require permits and/or authorization from the New York City Department of Buildings (NYCDOB), NYCDEP, and/or other local agencies. The selected Contractor will be responsible for obtaining all required local permits (e.g., building, grading, construction permits, construction water discharge) necessary to facilitate the construction.

4.3 Contractor Pre-Mobilization Submittals

Following contract award, the selected Contractor will be required to prepare pre-mobilization submittals for review by Con Edison and the Certifying Engineer. The Contractor will not be allowed to mobilize to the Site prior to review and approval of all required pre-mobilization submittals. These submittals will include, but not necessarily be limited to, the following:

- Contractor Construction Plan (CP) – The CP is required to present the Contractor's detailed approach for implementing the remedial work activities including work sequencing, traffic control plan, excavation shoring/stabilization methods, specific ISS technologies (e.g., auger mixing, excavator based mixing and/or jet grouting), and incorporating, as necessary, specifications, drawings, details, flow diagrams, charts, Site geologic/geotechnical information, and schedules,

- Contractor Health and Safety Plan (CHASP) – The Contractor will be required to prepare and submit a Site-specific CHASP (for use by the on-site personnel during the remediation activities) to provide a mechanism for establishing safe working conditions at the Site. The CHASP will be prepared in accordance with all applicable rules and regulations, including 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926, and shall be prepared by a Certified Industrial Hygienist. The Contractor is required to take all necessary precautions for the health and safety of all on-site personnel in compliance with all applicable provisions of federal, state, and local health/safety laws and the provisions associated with the CHASP. The Contractor will assume sole responsibility for the accuracy and content of its CHASP, and
- Preliminary Progress Schedule – The Contractor will prepare a preliminary schedule that identifies major work items and work sequences.

The above pre-mobilization submittals will be made available for NYSDEC review, as requested. Additional requirements regarding the content of these Contractor pre-mobilization submittals are provided throughout the Technical Specifications (**Appendix B**). The overall submittal process is presented in Specification Section 01350 – Document Submittal Procedures (**Appendix B**).

5.0 CONSTRUCTION ACTIVITIES

This section describes the construction activities to be performed at the Site, which includes monitoring well abandonment, survey control, structural surveys and monitoring, mobilization, Site preparation, environmental monitoring and controls, construction water management and treatment, demolition, soil excavation and excavation support, ISS treatment, material handling and management, decontamination, Site cover system, new monitoring well installation, and demobilization. In addition to the requirements indicated in the following subsections, the Design Drawings (**Appendix A**), and the Technical Specifications (**Appendix B**), construction activities will also be conducted in accordance with the following supporting plans:

- Construction Work Plan (CWP) – The contractor will prepare a CWP that describes the means and methods the contractors will use to implement each phase of project work described in the following sections and complete the project requirements in accordance with the Design Drawings (**Appendix A**), and Technical Specifications (**Appendix B**).
- ISS Work Plan (IWP) – An IWP will be prepared for the means and methods of each type of in-situ solidification being implemented at the site and included as part of the overall CWP.
- The CAMP (**Appendix H**) – The CAMP describes the monitoring activities that will be conducted to detect potential airborne releases of constituents of concern during the implementation of remediation activities and provides a description of the controls to be implemented to reduce odor-causing emissions, and
- Construction Quality Assurance Plan (CQAP) (**Appendix G**) – The CQAP describes the procedures to confirm the remedial activities planned for the Site are conducted and documented with an appropriate level of quality assurance and quality control. The CQAP identifies the steps to be used to monitor and document the quality of materials, condition, manner of installation, and construction.

Additionally, the Contractor will complete each remediation activity in accordance with the CHASP (discussed in Section 4.4). The Contractor will be responsible for conducting worker health and safety and workspace monitoring. The Certifying Engineer will conduct community air monitoring, in accordance with the CAMP, for the duration of the project.

It is anticipated that the remedial construction activities will be conducted following the general sequence described below. See Section 7 (Preliminary Project Schedule) for additional details regarding the overall project schedule.

A description of remedial construction activities, including references to supporting information, is presented in the following subsections.

5.1 Monitoring Well Protection, Abandonment, and Replacement

Prior to the commencement of remedial construction activities, existing monitoring wells located on Site will require abandonment and removal prior to implementation of the remediation activities.

Existing monitoring wells to either be protected or abandoned are identified on the Design Drawings (**Appendix A**). Monitoring wells to be protected during construction include one downgradient (MW-2) and one side gradient (MW-19). Monitoring wells to be abandoned prior to construction include upgradient wells MW-22, MW-3, and MW-6; side gradient well MW-1; and downgradient wells MW-4 and MW-21. The monitoring wells identified for abandonment will be abandoned in accordance with Specification Section 13011, Groundwater Well

Abandonment (**Appendix B**), and NYSDEC's CP-43 Groundwater Monitoring Well Decommissioning Policy. After the Site cover system is restored, one additional upgradient well and two additional downgradient wells will be installed within an appropriate proximity to the property boundary for use during long-term hydraulic and chemical monitoring of the OU-2.

5.2 Survey Control

The Contractor will retain a New York State licensed professional land surveyor (PLS) to maintain survey control during the construction activities. The Contractor will provide survey information to the Certifying Engineer to support record drawing documentation. Survey work associated with the construction activities will be performed in accordance with Specification Sections 01025 – Measurement and Payment, and 01050 – Surveying (**Appendix B**), and includes, but is not limited to, the following:

- A Pre-Construction Survey, depicting the pre-construction horizontal and vertical limits for the Site, including all subsurface areas, utilities, and structures,
- A Post-Excavation Survey, depicting the horizontal and vertical limits of material removed from the Site,
- An ISS Survey, depicting the horizontal and vertical limits of the ISS activities completed, and
- Final survey(s) will be completed to document the final as-built conditions and depict final grades and surface conditions for the Site. Final surveys will be signed and sealed by a New York State licensed PLS.

5.3 Structural Surveys and Monitoring

Structural surveys and monitoring will be performed to document and record the structural condition of buildings, structures, and utilities within and immediately adjacent to the Site. Structural conditions will be documented prior to construction (e.g., pre-construction condition) and after construction is completed (e.g., post-construction condition). Structural monitoring will include vibration monitoring performed daily during ground-intrusive activities (e.g., excavation, ISS treatment, compaction). Structural surveys and monitoring reports will be certified by New York state licensed structural engineer(s).

Two structures within the vicinity of the Site will require structural surveys and monitoring during remedial construction activities. These structures include the Intrepid Pedestrian Bridge walkway and concrete pier and a large multi-story building located on the neighboring property adjacent to the edge of the remediation in the northeastern area of the Site. The Intrepid Pedestrian Bridge Record Drawings are included in **Appendix F**, while as-built drawings for the adjacent building could not be located.

5.3.1 Pre- and Post-Construction Condition Surveys

Pre- and post-construction condition surveys will be performed on the existing structures prior to construction and after construction completion, respectively. The pre-construction condition survey will be performed by Contractor, and the post-construction condition survey will be performed by the Certifying Engineer.

Pre-construction condition surveys will collect information, such as location details and structure type, as well as particular information on materials, structural conditions, corrosion conditions of steels, existing damage, any signs of distress, and disrepair observed during visual survey. Pre-construction condition surveys will provide a graphical depiction of locations of existing damage or other features of concern. If any repair is required for existing structures, necessary repair or replacement shall be conducted prior to construction. Based on the results

of the pre-construction condition survey, acceptable vibration levels will be re-evaluated and additional structural monitoring may also be implemented.

Post-construction condition surveys will be performed using the same methods and requirements as the pre-construction condition surveys. Conditions observed from the post-construction condition surveys will be compared with those observed during the pre-construction condition surveys to determine if any corrective actions need to be taken by the Contractor.

5.3.2 Structural Monitoring

Structural monitoring will be performed in accordance with Specification Section 13091 – Structural Monitoring (**Appendix B**). Structural monitoring instrumentation will be installed at a number of existing structures to measure and monitor any movements of the existing structures during ground intrusive activities. Structural monitoring points, seismographs, and crack gauge locations will be installed per the Structural Monitoring Plan.

- Structural monitoring points will consist of a system specific point location for monitoring vertical (settlement or heave) and horizontal movement at an existing above ground structure that will be measured by optical survey methods,
- A seismograph is an instrument designed to monitor vibrations (peak particle velocity), and
- A crack gauge is a tool to measure the width of a crack in a structure and monitor change in width over time.

For the instrumentation installation locations, access for repair and/or replacement of damaged instrumentation will be considered. Information on the monitoring plan, including instrument installation, monitoring, calibration and maintenance, data collection, processing, presentation, interpretation and reporting, is included in Specification Section 13091 – Structural Monitoring.

Structural monitoring points will be established at locations identified based on the pre-construction condition survey results.

One seismograph will be placed at each location identified for structural monitoring.

5.3.2.1 Baseline Vibration Levels

The baseline vibration levels from daily operations will be measured prior to the start of construction, and for the baseline vibration measurement, both transient and continuous vibration levels will be measured. The threshold limits may be adjusted accordingly. A real-time monitoring system will be installed on the existing structures to monitor any potential movements of the existing structures to ensure the vibrations due to the construction activities are lower than the threshold limit during construction.

5.3.2.2 Response Levels and Action Plan

Structural monitoring instrumentation readings will be evaluated against a tiered-response criteria and include Precautionary, Action, and Maximum response levels. Precautionary, Action, and Maximum response levels for the instruments on the existing structures are provided in **Table 5.1**.

Precautionary Level: The precautionary levels have been established at 50 percent of the maximum levels. Monitoring of vibration and the movement of the existing structures are

recommended in accordance with the values provided in **Table 5.1**, which are based on our experience with similar projects.

Action Level: The action levels were determined at approximately two-thirds of the maximum levels. Monitoring of vibration and the movement of the existing structures are recommended in accordance with the values provided in **Table 5.1**, which are based on our experience with similar projects.

The action levels of the seismograph in **Table 5.1** may be adjusted based on background readings (i.e., baseline) after the instruments have been installed. If the baseline vibrations from the daily operations are greater than the response levels specified in **Table 5.1**, then the vibration response levels may potentially be increased up to, but not exceed, the maximum vibration level. If the baseline vibrations from the daily operations are less than the response levels specified in **Table 5.1**, then the response levels in **Table 5.1** will be used.

If an Action Level is reached:

- Contractor will implement the remedial measures to avoid reaching the Maximum Level.
- Contractor will take all necessary steps not to exceed the Maximum Level.

Contractor may be directed to suspend activities in the affected area except for those actions necessary to avoid exceeding the Maximum Level.

Maximum Level: If a Maximum Level is reached, work will stop, and the Site will be secured until remedial measures have been submitted to and approved by the Certifying Engineer.

Table 5.1 – Structural Monitoring Response Levels

Existing Structures	Precautionary Level	Action Level	Maximum Level
Pedestrian Walkway	Vertical Movement = 0.5 in Horizontal Movement = 0.5 in Vibration = 1.0 in/sec	Vertical Movement = 0.75 in Horizontal Movement = 0.75 in Vibration = 1.2 in/sec	Vertical Movement = 1.0 in Horizontal Movement = 1.0 in Vibration = 2.0 in/sec
Adjacent Multi-Story Building			

5.4 Mobilization

Mobilization activities include transporting personnel, equipment, and materials to the Site to support the construction activities. Mobilization activities include, but are not limited to, the following:

- On-site underground utilities will be marked out prior to initiating intrusive ground-disturbance activities by contacting the New York 811 One-Call System and by using a private utility locator. To support the utility mark-out for areas proposed for intrusive areas, the following activities will be undertaken as appropriate:
    - "As-built" or "record" drawings of Site utility plans will be reviewed.
    - The areas around planned subsurface intrusive work locations will be visually inspected.

- Field office trailers will be mobilized and established. Requirements for trailers and supporting telephone and internet services are presented in Specification Section 01521 - Temporary Field Offices and Structures (**Appendix B**),
- Electrical service will be obtained by coordinating with appropriate supplier(s). Requirements for obtaining electrical services and other utilities are presented in Specification Section 01510 – Temporary Utilities and Controls (**Appendix B**),
- Portable sanitary services will be provided and maintained for use by on-site personnel. Requirements for portable sanitary services are presented in Specification Section 01521 – Temporary Field Offices and Structures (**Appendix B**),
- Submittals (in addition to the pre-mobilization submittals) will be prepared and provided to the Certifying Engineer for review and approval, as required by the Contract Documents (e.g., Design Drawings, Technical Specifications), and
- The Contractor will obtain all necessary local authorizations and permits, as outlined in Section 4.

5.5 Site Preparation

The Site is currently secured by a chain-link security fencing bordering the entire perimeter of the Site. Pedestrians are currently allowed to enter this area to access the pedestrian bridge over Route 9A, which leads to the Intrepid Museum. Due to the critical nature of this bridge in providing safe access over Route 9A, access to the bridge must be maintained during construction. Privacy screening will be added to the existing perimeter fence and concrete jersey barriers and additional chain-link fencing with privacy screening will be installed to section off the portion of the Site that requires safe passage to pedestrians using the bridge in the northwest corner of the Site. Privacy screening will not be installed along the existing fence line in the northwest corner of the Site for security reasons. Privacy screening will also be installed along select portions of the pedestrian bridge itself as part of the Site security measures. The limits and construction details for the temporary fence system are shown on the Design Drawings. The Contractor will be required to submit plans detailing the phases of construction and proposed areas to use during construction, including the establishment of work zones (e.g., exclusion zone, decontamination zone). The components of the decontamination zone are detailed in Design Drawing C-500 Details (Sheet 1 of 2). Site access is shown on Design Drawing C-100 Site Preparation Plan (**Appendix A**). A traffic control plan and traffic control features will be established, as required by Specification Section 01552 – Traffic Control (**Appendix B**). Site preparation activities will follow and/or be performed concurrently with mobilization and will include the following:

- Site area conditions will be verified. In accordance with Specification Section 01050 – Surveying (**Appendix B**), the locations of aboveground and underground utilities, equipment, existing structures, and features (e.g., manholes, outfalls, buildings) will be identified, marked, and verified, as necessary to implement the construction activities. Current conditions (i.e., a site plan and approximate locations of known existing utilities) are shown on the Design Drawings (**Appendix A**), and
- Site control and safety measures will be installed, including temporary privacy screening, Site security fencing, gates, and project/warning signs, in accordance with Specification Section 01510 – Temporary Utilities and Controls (**Appendix B**).

5.6 Environmental Monitoring and Controls

5.6.1 Erosion and Sediment Controls

Prior to commencement of remedial construction activities, temporary erosion and sediment controls will be installed in accordance with the Design Drawings (**Appendix A**) and Specification Section 01110 – Environmental Protection Procedures (**Appendix B**) to prevent off-site transport of soil erosion and sedimentation. Site-wide erosion and sediment control (ESC) measures are a dynamic project element and will require modification as the construction needs change over time. Applicable ESC methods include the installation of sediment barriers, inlet protection, and stabilized construction entrance(s). Additionally, land grading will be implemented during construction activities in a manner that allows for the control and capture of stormwater to allow for treatment through installed ESC features.

5.6.2 Air Monitoring and Controls

The Certifying Engineer will be responsible for conducting community air monitoring and associated reporting for dust, vapor, and odor in accordance with the CAMP (**Appendix H**). The Contractor will be responsible for managing dust, vapor, and odor levels during the remedial construction and will implement corrective actions in the event of an exceedance in accordance with the requirements of the CAMP and Specification Section 01110 – Environmental Protection Procedures (**Appendix B**).

In the event of a sustained air monitoring action level exceedance for either dust, vapors, or odors, the Contractor and/or the Certifying Engineer will notify Con Edison as soon as the exceedance is identified. The Certifying Engineer will send a follow-up e-mail to NYSDEC, NYSDOH, Con Edison, and the Contractor within 24 hours of a sustained exceedance that summarizes the data, the cause of the sustained exceedance, and corrective measures implemented (or to be implemented) in response to the exceedance. Work will not continue until exceedances are addressed in consultation with Con Edison and the Contractor. Real time exceedances will be addressed immediately in consultation with the Contractor.

The Contractor will be responsible for conducting breathing zone air monitoring in accordance with the CHASP and Specification Section 01100 – Health and Safety Plan Requirements, as well as implementing health and safety measures necessary to be protective of Site workers.

5.6.3 Construction Spill Plan

Requirements for spill response actions, including reporting, are provided in Specification Section 01110 – Environmental Protection Procedures. Specific means and methods will be further detailed in the Contractor's Construction Spill Plan.

5.7 Construction Water Management and Treatment

Prior to initiating excavation operations, a temporary water treatment system (WTS) may be constructed and operational within the Contractor support area at the Site.

Water generated during the remedial construction activities may include:

- Groundwater and perched water from the excavations,
- Precipitation and surface-water runoff that enter the excavations, and
- Water generated by decontamination of equipment, trucks, and personnel.

The Contractor will be responsible for collecting, managing, and containerizing all water generated as a result of the remedial activities. If not disposed of off-site, collected water will be conveyed to the temporary WTS for treatment and discharged as per the applicable discharge permit.

If required, the temporary WTS will be designed to remove suspended solids, oil and grease, insoluble metals, VOCs, and SVOCs or any other contaminant specified in the applicable discharge permit from the water. The Contractor will be responsible for the setup and operation of the temporary WTS and achieving the discharge criteria specified in the applicable discharge permit. The Contractor will be responsible for conducting sampling required under the applicable discharge permit. A general treatment process flow diagram for temporary WTS components is provided in the Design Drawings (**Appendix A**) and the requirements are provided in Specification Section 02145 – Water Treatment and Disposal (**Appendix B**). It is anticipated treated water will be discharged to the storm sewer manhole located on West 45th Street under the SPDES equivalency permit. Residuals from the temporary WTS (i.e., settled solids, expended filter bags, granular activated carbon media, and organoclay) will be managed and disposed of with the excavated material.

5.8 Demolition

5.8.1 Existing Infrastructure

To facilitate ISS treatment and remediation activities, demolition and removal of existing infrastructure will be necessary as part of the soil excavation and ISS treatment activities. Demolition and removal of existing infrastructure will include groundwater monitoring wells, asphalt pavement, concrete, and sidewalk surfaces. The limits of disturbance and removal activities are shown in the Design Drawings (**Appendix A**) and will be completed in accordance with Specification Sections 01732 – Selective Demolition and 13011 – Groundwater Monitoring Well Abandonment (**Appendix B**).

5.8.2 Removal of Subsurface Structures

Prior to the implementation of ISS treatment, demolition and removal of subsurface structures will be necessary to facilitate the remedial activities. During investigation activities, a former gas holder, a suspected tar tank, components of other remnant structures, and various clay and metal piping were encountered at depths ranging from 1 to 10 feet bgs and may be encountered deeper. The vertical and horizontal extent of observed subsurface features were summarized during the PDI (Parsons 2016) and SPDI (Parsons 2022), and they are shown on the Design Drawing C-051 Historical Conditions Plan (**Appendix A**).

To the extent practicable, subsurface structures and features will require removal to allow for complete and effective treatment of areas identified for ISS treatment. If sufficient effort is made to remove and extract subsurface structures, as specified in the CQAP (**Appendix G**), the obstruction may remain in-situ, provided it does not inhibit the ISS treatment process. If obstruction removal cannot be met because of risk of damage to installed construction, existing structures, or other limitations, the Contractor will notify Con Edison and the Certifying Engineer in writing of the obstruction location(s) and concern(s). Con Edison and the Certifying Engineer will coordinate with NYSDEC to determine if any corrective measures (e.g., jet grout) are necessary for the existing structure that is to remain in-place.

5.9 Soil Excavation and Excavation Support

This section describes the soil excavation and excavation support activities that will be performed associated with the Remedial Action for the Site.

5.9.1 Excavation and Debris Removal

As part of the NYSDEC-selected remedy, excavation of Site soils is required. Approximately 2,500 cubic yards of soil will be excavated from the surface of the Site. Excavation will be performed to a depth of approximately 3.5 feet bgs. Additionally, the excavated area will

facilitate management of the ISS swell material generated as part of the ISS treatment process. The limits of excavation are shown on the Design Drawings (**Appendix A**) and excavation requirements are presented in Specification Section – 02315 Excavation (**Appendix B**).

The Contractor will be responsible for performing a Pre-Construction Survey to identify and layout the lateral extents of excavation. Prior to implementation of ISS treatment, the Contractor will perform a Post-Excavation Survey depicting the horizontal and vertical limits of material removal.

5.9.2 Excavation Support

The Contractor will be responsible for designing, providing, installing, monitoring, and maintaining excavation support systems (if necessary) to facilitate excavation of materials from the excavation areas shown on the Design Drawings (**Appendix A**).

Safety measures used to protect work areas will be identified in the CHASP. Perimeter flagging, construction fencing and/or tape may be used as necessary to provide for safe control of the work area, including when the work area is unattended.

Excavation and excavation support, if necessary, will be performed in a manner and sequence that prevents migration of contaminants to clean areas. Slopes will comply with Occupational Safety and Health Administration (OSHA) requirements (29 Construction CFR 1926.650 through 1926.652).

5.10 ISS Treatment Support

This section describes the ISS treatment activities that will be performed to the contaminated soils on Site.

The horizontal and vertical limits of ISS treatment are presented on Drawing C-103 in the Design Drawings (**Appendix A**) and are based on the evaluation of the nature and extent of NAPL conducted during the Site Characterization (Parsons 2003, 2006) and approved by NYSDEC, as detailed in the Decision Document (July 2021). The horizontal and vertical extents approved by NYSDEC address soils that were identified during investigation activities to contain MGP-related impacts (primarily in the form of NAPL-saturated soil). In isolated instances, NAPL was identified in select borings at or near the bedrock interface. Based on the discontinuous nature of NAPL-impacted soil identified near the bedrock surface, the potential for deeper instances of NAPL are isolated, and implementation of ISS within a 5-foot radius of identified NAPL near the bedrock surface is a conservative approach to addressing discontinuous and isolated pockets of NAPL. The deepest impacts detected in the vertical plane did not extend as far horizontally as the impacts detected in the shallower soils. For this reason, ISS treatment will be implemented in three distinct vertical zones from the bottom of excavated zone to 15 feet bgs, to 30 feet bgs, or to bedrock. In areas where ISS has been designed to terminate above bedrock (15 feet or 30 feet), ISS will be terminated at the design depths or at bedrock, whichever is encountered first. ISS treatment requirements are provided in Specification Sections 02160 – ISS using Auger Mixing, 02161 – ISS using Excavator Based Mixing, and 02162 – ISS using Jet Grouting (**Appendix B**).

The Contractor will be responsible for preparing an IWP for submittal to the certifying engineer. The IWP will describe the proposed construction equipment, procedures, and schedules for performing the ISS treatment. The IWP will also detail the following components of the ISS treatment:

- Construction means and methods – listing of construction steps; handling of excess grout and spoils; layout; overlap control; and control of drainage, spills, and wastes.

The Contractor should take into consideration known debris/obstructions at the Site and presence of NAPL in proposed ISS area as presented in the Site Characterization Report (Parsons 2003, 2006),

- Construction layout drawings – showing the geometry, overlaps, volume, and dimensions of the column/cell overlapping pattern. The proposed ISS layout considering daily anticipated production rates, varying subsurface conditions across the Site, and overall column/cell mixing time to minimize remolding of grout-soil mixing during initial curing. The proposed ISS column/cell layout will show the center point of each column/cell and/or the corner points of each cell including the overlap between adjacent columns/cells. The proposed ISS column/cell layout will include a table with point coordinates, and
- Construction Quality Control (CQC) procedures - describing all testing, sampling, reporting forms, methods, responsible persons, non-conformance procedures, and all other means to ensure the quality of the Work. The Contractor's CWP and IWP and associated CQC procedures will be prepared in accordance with NYSDEC's In-Situ Solidification QA/QC technical guidance.

5.10.1 ISS Test Section

Due to the historical Site use and variable bedrock surface, the Contractor will be responsible for performing an ISS test section (i.e., pilot-test) on Site. The pilot-test will be performed prior to implementing full-scale production ISS treatment activities. The results of the pilot-test will be used to verify that the performance requirements can be met and confirm application parameters of the selected mix design(s) required for the means and methods proposed by the Contractor. The ISS test section requirements are provided in Specification Sections 02160 – ISS using Auger Mixing, 02161 – ISS using Excavator Based Mixing, and 02162 – ISS using Jet Grouting (**Appendix B**).

5.11 Material Handling and Management

Excavated soils, ISS swell materials, debris, and miscellaneous wastes generated during construction activities will be handled and disposed off-site pursuant to applicable Federal, State, and Local regulations and in accordance with Specification Section 02120 – Off-Site Transport and Disposal (**Appendix B**). Materials impacted with visible NAPL, if any, will be considered conditionally exempt and will be treated by low temperature thermal desorption (LTTD). Removed debris free of visible impacts (e.g., brick and concrete), will either be reused on Site if feasible or be disposed of at an appropriate facility approved by Con Edison. Non-visually impacted materials will be disposed of at a non-hazardous solid waste facility selected by Con Edison.

All trucks transporting material off-site will be lined, covered, and equipped with a sealed tailgate. Trucks used to haul material off-site must have NYSDEC Part 364 transporter permits and contain the appropriate NYSDOT placarding for waste transport, as applicable. The beds of transport trucks loaded with Site materials will be properly covered and secured with polyethylene sheeting and tarps prior to leaving the Site. If required, odor and dust control measures will be conducted on transport trucks as well.

If the tires of the transport trucks to be used for transport come into contact with impacted Site materials, (e.g., excavated soils, ISS swell materials, or construction water) the tires will be cleaned in accordance with Section 5.12, Decontamination and Specification Section 02125 – Decontamination (**Appendix B**), prior to transport outside of the grading area.

5.11.1 Material Stockpiling and Dewatering

Excavated soils that are too saturated to transport will be stockpiled within a lined material staging area for chemical dewatering with a drying agent (e.g., Portland cement, cement kiln dust), as necessary, to meet the required moisture content for over-the-road transport (i.e., achievement of the USEPA "Paint Filter Test") and/or the requirements of the off-site treatment/disposal facility.

Attempts will be made to reduce the need for drying agents, such as blending drier material with other material that is more saturated. It is anticipated that solidification agents, if any, will be mixed at less than 10 percent by volume with the excavated soils to make it suitable for transport for off-site disposal. The Contractor may elect to perform a treatability test to support selection of the optimal drying agent and dosage rate prior to construction and/or modifying the drying agent and dosage rate during construction based on paint filter tests.

5.11.2 Waste Characterization

Following chemical dewatering, the stockpiled material will be covered with polyethylene sheeting. Prior to load out, the stockpiled material will be sampled by the Contractor for waste characterization in accordance with the requirements of the selected disposal facility. Anticipated waste characterization parameters are provided in Specification Section 02120 – Off-Site Transport and Disposal (**Appendix B**). Following receipt of waste characterization analytical results, stockpiled material will be loaded out in dump trailers for transportation to the selected disposal facility.

Bills of lading will be prepared and provided to the waste hauler prior to shipment of non-hazardous materials. If hazardous materials require transport off-site, shipping documentation will be prepared in accordance with 49 CFR Part 172; if hazardous waste requires transport off-site, a manifest will be prepared in accordance with 40 CFR Part 262. A truck waste disposal log will be maintained to record each truck, waste material being carried, estimated weight, and disposal facility destination.

5.12 Decontamination

The Contractor will decontaminate (as necessary), within the constructed decontamination area, all personnel and equipment, and vehicles that come into contact with excavated materials. All construction vehicles leaving the Site (including vehicles that had been transporting clean fill) will be cleaned and/or decontaminated by the Contractor (as necessary) to prevent the tracking of soil off-site.

At a minimum, the Contractor will decontaminate the Contractor's project equipment that comes in contact with removed soil materials (including, but not limited to, soil removal, transport, and blending equipment, trucks, liquid handling equipment, pumps, and hand tools) prior to exiting and demobilizing and prior to handling clean material in accordance with Specification Section 02125 – Decontamination (**Appendix B**). The Contractor will perform decontamination activities until no visible soil, sediment, debris, or stains are present on the equipment surfaces (to the satisfaction of Con Edison and/or the Certifying Engineer). Equipment, such as pumps, will be flushed using clean water and appropriate cleaning agents (as necessary) to the satisfaction of Con Edison and/or the Certifying Engineer.

Unless otherwise directed by Con Edison and/or the Certifying Engineer, any equipment to be removed from the Site by the Contractor will be subject to a final visual inspection by Con Edison, the Certifying Engineer, and/or NYSDEC following cleaning. Precautions will be taken to limit contact between the equipment, personnel performing the cleaning activities, and any cleaning liquids that may accumulate in the decontamination area. The decontamination/ wash area includes provisions for wash water collection, and any water generated during

decontamination activities will be treated in accordance with Specification Section 02145 – Water Treatment and Disposal (**Appendix B**).

5.13 Site Cover System

This section summarizes the Site cover system that will be constructed to address the direct contact contaminant exposure pathways for the impacts that will remain on Site. A Site cover system is required as an engineering control (EC) because soils exceeding applicable SCOs for commercial use will remain within the ISS treated areas. The Site cover system will provide thermal protection of the ISS treated areas from freeze/thaw cycles and prevent contact with the ISS material. The Site cover system limits are shown on the Design Drawings (**Appendix A**).

Materials intended for reuse at the Site or proposed to be imported to the Site for use in the cover system will be submitted to NYSDEC for approval via NYSDEC's Request to Import/Reuse Fill or Soil Form. Imported materials used to construct the Site cover system will meet the applicable SCOs for commercial use set forth in 6 NYCRR Part 375-6.7(d). The ISS treated areas will receive a minimum of 31.5 inches of material meeting the SCOs for commercial use. Imported material will be compacted in lifts, a minimum of 12-inches thick or per the requirements specified on the Design Drawings (**Appendix A**) and in the Technical Specifications (**Appendix B**). Once the Site cover system has been placed, final surface restoration activities will be performed to return the Site to pre-construction conditions. Final surface restoration activities will include the restoration of concrete walkways, asphalt pavement parking areas, and any other Site features that were removed as part of the construction.

Construction details of the Site cover system and final surface restorations are presented on the Design Drawings (**Appendix A**) and in Specification Sections 02310 – Rough Grading and Backfill, and 02741 – Bituminous Concrete Pavement (**Appendix B**).

5.14 Demobilization

Demobilization requirements are presented in Specification Section 01700 – Project Closeout Requirements (**Appendix B**). Demobilization activities are summarized below.

- Completion of "punch list" items, to be identified by the Certifying Engineer and Con Edison,
- Removal of support area(s), staging area(s), decontamination area, equipment, or material installed or staged outside of the contractor support/laydown area,
- Removal and disposal of all impacted materials from the material stockpile areas including the decontamination/wash area,
- Remove erosion and sediment control measures when the remedial activities are completed,
- Transport residual wastes (e.g., disposable equipment; personal protective equipment [PPE]; sampling equipment; cleaning residuals; sacrificial soil and liners from the material staging, and equipment decontamination areas) remaining at the completion of the remedial activities for off-site disposal in accordance with applicable rules and regulations,
- Remove/dispose of project-related material, equipment, and support structures from the project area, as appropriate based on the work remaining to be completed the following season, and
- Prepare and provide required final field records and submittals to the Certifying Engineer.

6.0 SUSTAINABILITY

To the extent feasible, green construction principles and techniques will be required to promote sustainability while conducting work. In accordance with NYSDEC DER-31 Green Remediation (NYSDEC 2010b), these practices will be aimed at reducing waste generation, energy usage, water usage, and emission releases. The major green remediation components are as follows:

- Reduction in the excavation depth from 5 feet to 3.5 feet for the reasons identified in Section 1.4 – Summary of Remedial Action,
- Using solar powered monitoring equipment and/or battery chargers,
- Using recycled materials (e.g., paper, lubrication oil) instead of virgin materials, where practicable,
- Recycling all non-contaminated debris and construction waste (e.g., asphalt, metals), where practicable,
- Using biodegradable fluids for equipment and environmentally acceptable lubricants for oil-water interfaces, to the extent practicable,
- Using local sources for procurement of imported materials, to the extent practicable, and
- Minimizing clearing of vegetation.

Additionally, BMPs will be implemented to execute construction activities in a manner that minimizes the potential for negative impacts on the environment. Examples of such BMPs include the following:

- Minimizing access routes into the work areas and maintaining designated vehicular traffic routes onsite to protect ecosystems,
- Limiting, where practical, the footprint of equipment staging material processing areas, remediation areas, and field offices, and restoring the footprint to original condition upon completion of the project,
- Collecting and treating on Site potentially impacted wastewaters encountered during operations,
- Maintaining pollution prevention and waste minimization programs from initiation of mobilization activities to project closeout,
- Inspecting on Site equipment daily for clean operation,
- Maintaining good Site housekeeping practices,
- Using low emission diesel equipment and fuel,
- Reducing project emissions by minimizing idle time for equipment by shutting down equipment not being actively used,
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste,
- Maximizing habitat value and creating habitat when possible,
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals, and
- Integrating the remedy with the end use where possible and encouraging green and sustainable redevelopment.

7.0 PRELIMINARY PROJECT SCHEDULE

The project schedule is dependent on NYSDEC approval of the RDR and other factors such as permitting authorizations, and stakeholder agreements. Parsons will develop a detailed construction schedule at the time of RDR approval.

Approximated final remedial design and construction project milestones and/or durations are identified in **Table 7.1**.

Table 7.1 – Preliminary Project Schedule

Milestone	*Target Date and /or Duration*
Final Design Package Approval	2Q 2026
Contractor Procurement	3Q 2026 to 1Q 2027
Construction Execution	2Q 2027 to 1Q 2028

8.0 ENGINEERING CONTROLS AND INSTITUTIONAL CONTROLS

This section summarizes the proposed ECs and institutional controls (ICs) to address the direct-contact contaminant exposure pathway for soil that will remain on Site. ECs/ICs are required at the Site since NAPL-impacted materials will remain below the ECs. These controls will include the Site cover system as an EC and an environmental easement (i.e., deed notice) in accordance with NYSDEC DER-10 and the provisions of Article 71, Title 36 of the NYSDEC Law as an IC. Additionally, in accordance with NYSDEC DER-10, a final SMP will be prepared to specify the methods necessary to ensure compliance with the ECs and ICs required for the Site.

8.1 Engineering Controls

The Site cover system will serve as an EC to mitigate the potential impact via the direct contact with the ISS remedy, and potential impact via groundwater exposure pathways for impacted soil within the limits of the Site. A Site cover will be required to allow for commercial use of the Site and to protect the ISS component of the remedy. In the ISS areas, the function of this cover will be to provide sufficient thermal protection of the solidified mass from seasonal freeze/thaw cycles and prevent contact with the ISS material.

The Site cover system will consist of approximately 1.0 acre of asphalt and concrete cover.

8.2 Institutional Controls

After completing the remedial construction activities, an environmental easement will be recorded with the New York City Clerk. The environmental easement for the controlled property will:

- Require the remedial party or Site owner to complete and submit to NYSDEC a periodic certification of ICs and ECs in accordance with Part 375-1.8 (h)(3),
- Allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws,
- Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH or New York City Department of Health (NYCDOH), and
- Require compliance with NYSDEC-approved SMP.

9.0 POST-REMEDIATION ACTIVITIES

Activities to be conducted following the completion of remediation activities at the Site include the following:

- Preparing an FER for OU-2.
- Prepare a final SMP to include post-construction monitoring activities required for the Site.

General requirements for the content of the FER and SMP are described below.

9.1 Final Engineering Report

The Certifying Engineer will prepare and submit an FER to NYSDEC at the conclusion of remedy implementation to document the remedial construction activities completed for OU-2.

The FER will be prepared in accordance with NYSDEC DER-10 (NYSDEC 2010a) and the NYSDEC Generic Template for Final Engineering Reports (available on the NYSDEC website). At minimum the FER will present the following information:

- Description of the remediation activities, including variations, if any, from the NYSDEC-approved RDR,
- Record ("as-built") drawings, tables, and figures detailing the remediation activities completed and indicating that acceptance criteria were met,
- Information and documentation regarding the final quantities and disposition of materials disposed of/treated off-site during implementation of the remediation activities, including executed manifests and bills of lading,
- Summaries of field observations, tests performed, laboratory samples collected, and monitoring results obtained during construction,
- Summaries of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies discovered,
- Representative photographs taken during implementation of the remediation activities,
- Copies of regulatory permits and other key regulatory agency correspondence related to the permits and permit compliance, and
- Certification statement signed and sealed by a professional engineer (PE) licensed in New York State.

A draft FER will be submitted to NYSDEC for review. Following receipt of NYSDEC comments, the FER will be revised accordingly, and a stamped/signed final version of the FER will be submitted to NYSDEC.

9.2 Site Management Plan

Pursuant to the requirements of the Design Document (NYSDEC 2021), an SMP is required. The SMP will include the following:

- IECP that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following ICs and/or ECs remain in place and effective,
- MP to assess the performance and effectiveness of the remedy, and

Details of the required plans are described below.

9.2.1 Institutional and Engineering Controls Plan

The ICEP will include, at a minimum, the following:

- An Excavation Plan that details the provisions for management of future excavations in areas of remaining impacts,
- Descriptions of the provisions of the environmental easement, including any land use and groundwater use restrictions,
- A provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the Site, and off-site locations, including those that previously did not respond or refused sampling offers, and include provisions for implementing actions recommended to address exposures related to soil vapor intrusion,
- Provisions for the management and inspection of the identified ECs,
- Maintaining Site access controls and NYSDEC notification, and
- The steps necessary for the periodic reviews and certification of the ICs and/or ECs.

9.2.2 Monitoring Plan

The MP will include, at a minimum, the following:

- Monitoring groundwater to assess the performance and effectiveness of the remedy,
- A schedule of monitoring and frequency of submittals to NYSDEC, and
- Monitoring for vapor intrusion for any buildings developed on the Site, and off-site locations including those that previously did not respond or refused sampling offers, as may be required by the IECP discussed above.

10.0 REFERENCES

AKRF and Parsons, 2003. Site Characterization Work Plan

New York Code of Rules and Regulations. Title 6, Part 375-6.

NYSDEC, 2010a. Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation.

NYSDEC, 2010b. Division of Environmental Remediation Green Remediation.

NYSDEC, 2021. Decision Document CE – W. 45th St. Gas Works Operable Unit Number 2: Northern Holder/Intrepid Lot Manufactured Gas Plant Program. July.

Parsons, 2003. Site Characterization Report for the Former West 45th Street Works Site (Operable Unit 2). December.

Parsons, 2006. Data Summary for Additional Site Characterization Activities at the West 45th Street Works Site Operable Unit No. 2. May.

Parsons, 2012. Pre-Design Investigation Work Plan for the West 45th Street Gas Works Site Operable Unit 2.

Parsons, 2016. Pre-Design Investigation Summary Report for the Former West 45th Street Gas Works Site – Operable Unit 2. November.

Parsons, 2022. Remedial Design Work Plan for the Former West 45th Street Gas Works Site Operable Unit 2. January

Parsons, 2024. Remedial Design Work Plan Summary Report for the Former West 45th Street Gas Works Site Operable Unit 2. September.

USEPA, 1989. Solidification/Stabilization of CERCLA and RCRA Wastes, Physical Tests, Chemical Testing Procedures, Technology Screening, and Field Activities. EPA/625/6-89/022.

FIGURES

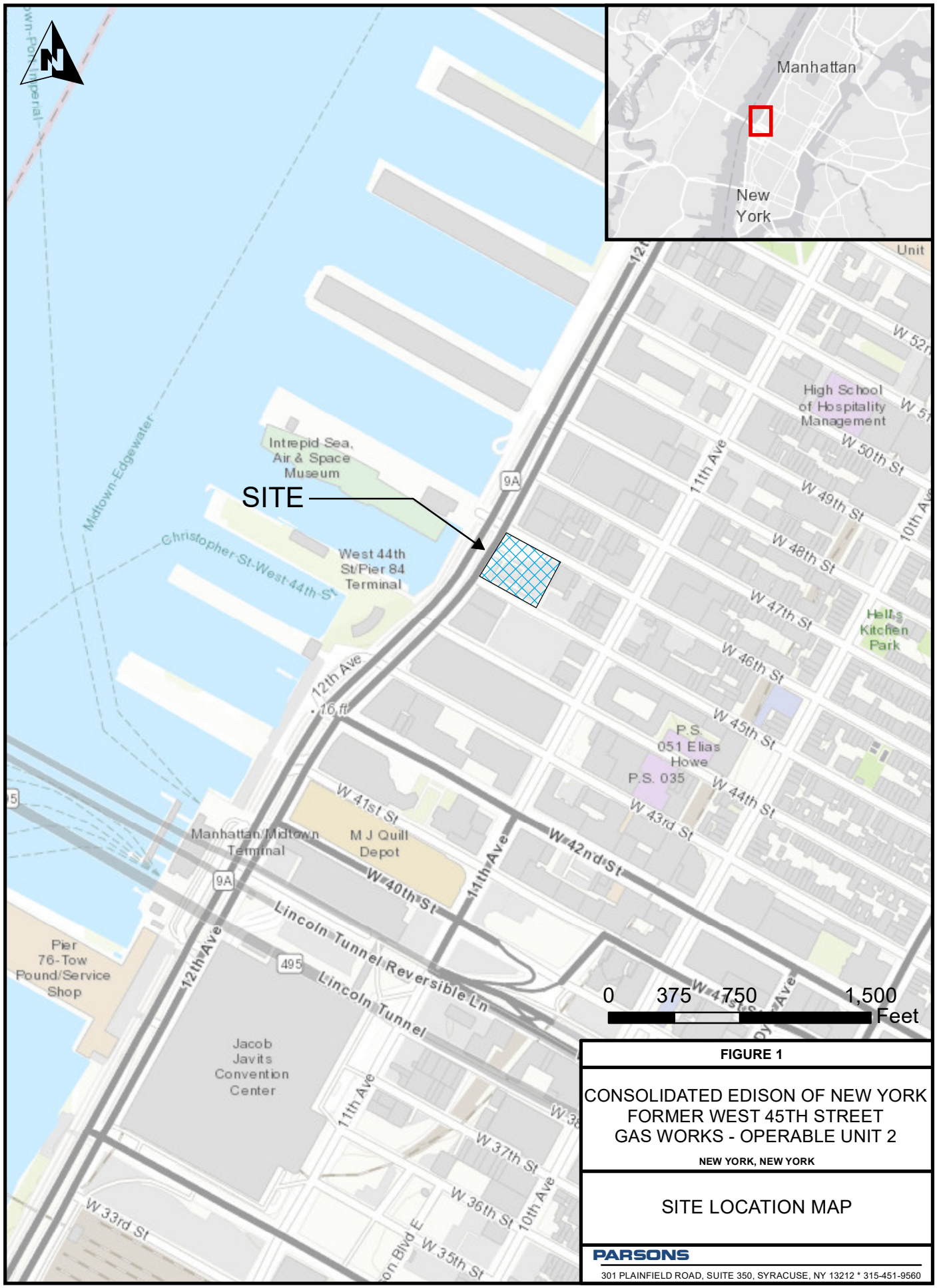


FIGURE 1

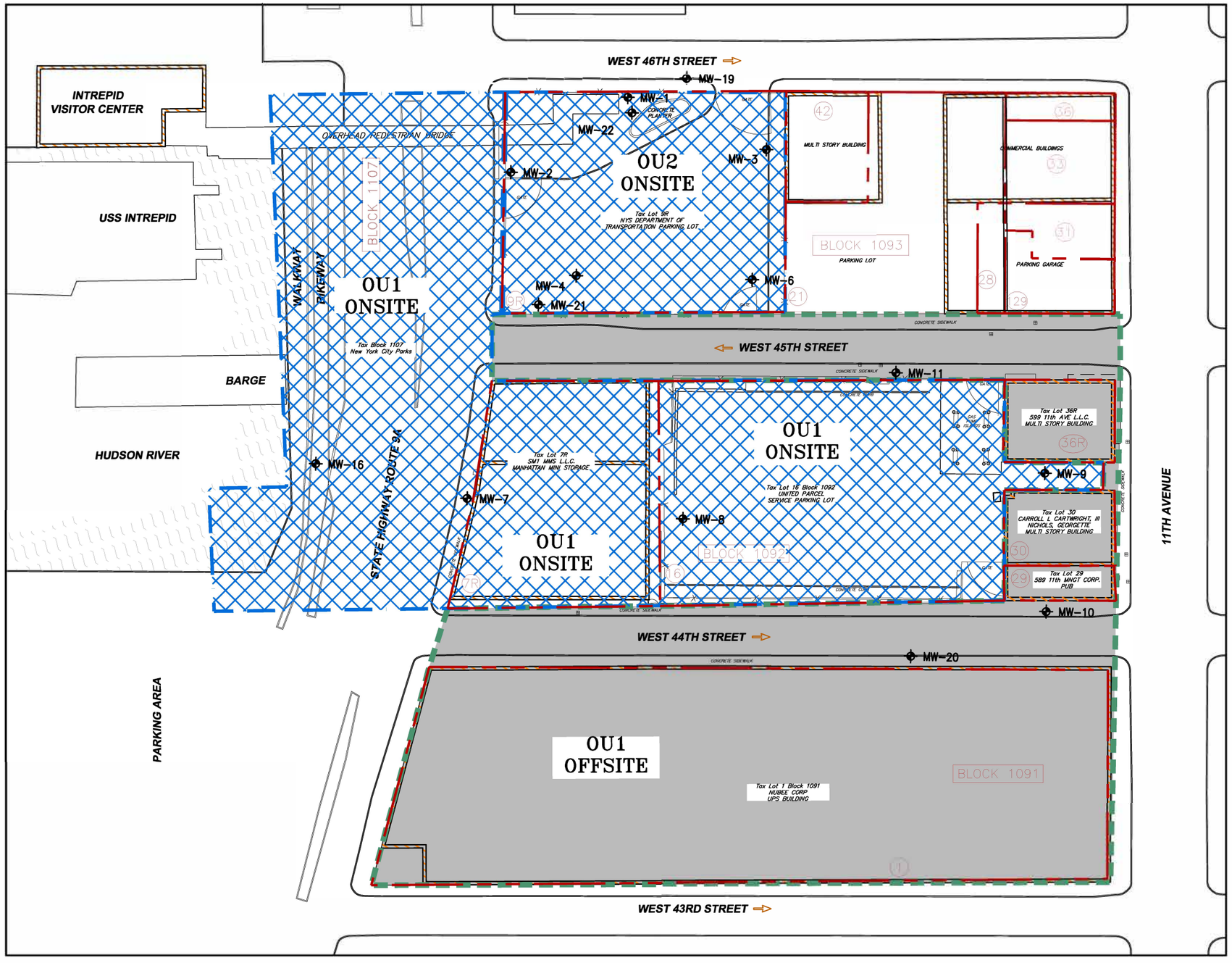
CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45TH STREET
GAS WORKS - OPERABLE UNIT 2

NEW YORK, NEW YORK

SITE LOCATION MAP

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

FILE NAME: P:\ConEd\450089 - W45th OU-2 AAR 2016\ENGR\OU2\Figure 1 Site Location.mxd
DATE: 12/7/2021 CREATED BY: S. Liberatore



LEGEND:

- CURRENT FEATURES
- HISTORICAL FEATURES (LOCATIONS ARE APPROXIMATE)
- EXISTING BUILDING
- CHAIN LINK FENCE
- MONITORING WELL
- OU-1/OU-2 ON-SITE
- OU-1 OFF-SITE
- BLOCK 1093 — TAX BLOCK NUMBER
- 21 — TAX LOT NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARIES

100 50 0 100 200

SCALE: 1"=100'

FIGURE 2

CONSOLIDATED EDISON OF NEW YORK
WEST 45th STREET
NEW YORK, NEW YORK

LOT AND BLOCK ON-SITE AND OFF-SITE PROPERTY OWNERS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\CONED\448953 - WEST 45TH STREET RAWP - SMP\CAD\FIGURES\448953-SK007.DWG
PLOT DATE: 4/13/2022 12:55 PM PLOTTED BY: RUSSO, JILL [US-US]

APPENDIX A
DESIGN DRAWINGS

IN-SITU STABILIZATION/SOLIDIFICATION REMEDIAL DESIGN
FORMER WEST 45TH STREET GAS WORKS SITE
MANHATTAN, NEW YORK

OPERABLE UNIT 2

PREPARED FOR: CON EDISON
MARCH 2026

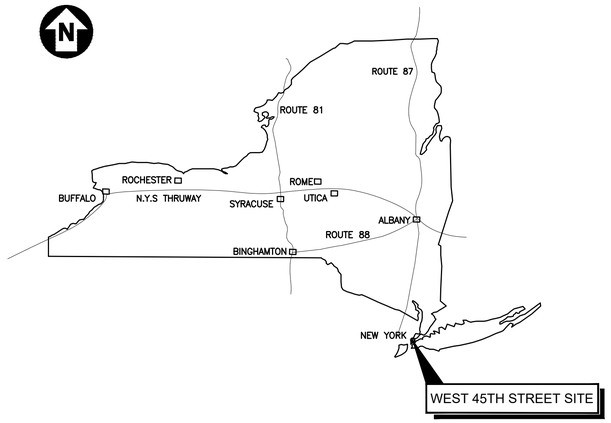


SITE LOCATION MAP

1" = 500'

DRAWING INDEX

DOB DRAWING No.	REVISION	TITLE
GENERAL		
453607-G-001	D	TITLE SHEET, DRAWING INDEX, AND SITE LOCATION
453607-G-002	D	GENERAL LEGEND, NOTES, AND ABBREVIATIONS
453607-G-003	D	LAYOUT POINTS
CIVIL		
453607-C-050	D	EXISTING CONDITIONS PLAN
453607-C-051	D	HISTORICAL CONDITIONS PLAN
453607-C-100	D	SITE PREPARATION PLAN
453607-C-101	D	DEMOLITION PLAN
453607-C-102	D	EXCAVATION PLAN
453607-C-103	D	ISS PLAN
453607-C-104	D	SITE RESTORATION PLAN
453607-C-105	D	PAVEMENT RE-STRIPING PLAN
453607-C-300	D	CROSS SECTIONS (SHEET 1 OF 3)
453607-C-301	D	CROSS SECTIONS (SHEET 2 OF 3)
453607-C-302	D	CROSS SECTIONS (SHEET 3 OF 3)
453607-C-500	D	DETAILS (SHEET 1 OF 2)
453607-C-501	D	DETAILS (SHEET 2 OF 2)
453607-C-600	D	PROCESS FLOW DIAGRAM CONSTRUCTION WATER TREATMENT SYSTEM



SITE VICINITY MAP

N.T.S.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER 453607

DWG. NO. G-001 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 1

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	AS SHOWN
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
TITLE SHEET, DRAWING INDEX, AND SITE LOCATION

SEAL & SIGNATURE

NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-G-001
SHEET No. 1 OF 17

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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GENERAL LEGEND:

	EXISTING CURB
	EXISTING DEPRESSED CURB
— x — x — x —	EXISTING CHAIN LINK FENCE
— — — — —	EXISTING DRAINAGE LINE
DHW	EXISTING OVERHEAD WIRE
-14-	EXISTING CONTOUR LINE
	PARCEL BOUNDARY
UNK	UNKNOWN UTILITY MARKOUT
G	EXISTING GAS LINE
W	EXISTING WATER LINE
SAN	EXISTING SANITARY LINE
E	EXISTING ELECTRIC LINE
	EXISTING DRAINAGE INLET
	EXISTING SANITARY SEWER MANHOLE
	EXISTING FIRE HYDRANT
WV	EXISTING WATER VALVE
GV	EXISTING GAS VALVE
	EXISTING ELECTRIC STRUCTURE
	EXISTING UTILITY BOX
	EXISTING UTILITY MANHOLE
	EXISTING LIGHT POLE
	EXISTING MONITORING WELL
	EXISTING SIGN
	EXISTING BOLLARD
	EXISTING ROOF DRAIN
	EXISTING CONTROL POINT
	EXISTING TREES
MW-4	EXISTING MONITORING WELL

ABBREVIATIONS AND ACRONYMS:

APPROX.	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BGS	BELOW GROUND SURFACE
BLDG	BUILDING
BOB	BOTTOM OF BOREHOLE
CEP	CORPORATE ENVIRONMENTAL PROCEDURES
CFR	CODE OF FEDERAL REGULATIONS
CNR	CORNER
CONC	CONCRETE
CORS	CONTINUOUSLY OPERATING REFERENCE STATION
CTR	CENTER
C&D	CONSTRUCTION AND DEMOLITION
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DOB	DEPARTMENT OF BUILDINGS
ELEV/EL	ELEVATION
EXP	EXPANSION
FNC	FENCE
FT	FOOT OR FEET
GAC	GRANULAR ACTIVATED CARBON
GEI	GENERAL ENVIRONMENTAL INSTRUCTIONS
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM
GRT	GRATE
IN	INCH OR INCHES
INV	INVERT
ISS	IN-SITU STABILIZATION/SOLIDIFICATION
NA	NOT AVAILABLE
NAD 83	NORTH AMERICAN DATUM OF 1983
NAPL	NON-AQUEOUS PHASE LIQUID
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
NEC	NATIONAL ELECTRIC CODE
NGS	NATIONAL GEODETIC SURVEY
NO.	NUMBER
NYC	NEW YORK CITY
NYCDOB	NEW YORK CITY DEPARTMENT OF BUILDINGS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OC	ON CENTER
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PL	PROPERTY LINE
PVC	POLYVINYL CHLORIDE
RCNY	RULES OF THE CITY OF NEW YORK
RDR	REMEDIAL DESIGN REPORT
SCHD	SCHEDULE
SHT	SHEET
SP	SAMPLING POINT
SPT	STANDARD PENETRATION TEST
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
UL	UNDERWRITERS LABORATORIES
USEPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USE OF PLANS:

1. ONLY CONSTRUCTION DRAWINGS AND TECHNICAL SPECIFICATIONS INDICATING "ISSUED FOR CONSTRUCTION" SHALL BE USED FOR BIDDING AND/OR CONSTRUCTION PURPOSES. CONSTRUCTION DRAWINGS ARE INTENDED TO BE USED WITH THE TECHNICAL SPECIFICATIONS. UNLESS CONSTRUCTION DRAWINGS INDICATE "ISSUED FOR CONSTRUCTION", CON EDISON AND ITS ENGINEER NEITHER GUARANTEE THE ACCURACY OF THIS INFORMATION NOR CLAIM THIS INFORMATION IS NECESSARILY INDICATIVE OF CONDITIONS TO BE ENCOUNTERED.
2. THE CONTRACTOR SHALL SATISFY ALL CONDITIONS AFFECTING THE WORK BY PERSONAL INVESTIGATION, AND NEITHER THE INFORMATION PROVIDED, NOR THE INFORMATION DERIVED FROM MAPS OR DRAWINGS, NOR FROM THE ENGINEER, CON EDISON OR THEIR AGENTS OR EMPLOYEES, SHALL ACT TO RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY HEREUNDER FROM FULFILLING ALL OF THE TERMS AND REQUIREMENTS OF THE CONTRACT DOCUMENTS.
3. THE CONTRACTOR SHALL REVIEW ALL COORDINATES, DIMENSIONS, AND LOCATIONS IN THE FIELD. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY CON EDISON OR THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE FIELD CONDITIONS.
4. ALL UNITS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.

GENERAL:

1. CONTRACTOR SHALL PERFORM ALL WORK INDICATED IN THE CONTRACT DOCUMENTS IN ACCORDANCE WITH THE NYC CONSTRUCTION CODE, RULES AND REGULATIONS OF NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) AND THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NYCDEP), OR OTHER AUTHORITIES HAVING JURISDICTION. IN CASE OF DIFFERENT REQUIREMENTS FOR THE SAME TYPE OF WORK OR TRADE, THE MORE STRINGENT REQUIREMENT GOVERNS.
2. BEFORE WORK MAY COMMENCE, CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING MONITORING WELLS, INLETS, CATCH BASINS, MANHOLES, SIDEWALKS, CURBING, STAIRS, POLES, LANDSCAPED AREAS, AREAS TO BE REMEDIATED, ETC. ANY CONFLICTING INFORMATION SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNER OR ITS REPRESENTATIVE.
3. CONTRACTOR SHALL ACQUIRE ALL NECESSARY PERMITS OTHER THAN THOSE ALREADY OBTAINED BY THE OWNER. PERMITS OBTAINED BY THE OWNER ARE INCLUDED WITH THE BID SPECIFICATION PACKAGE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND PAYING ANY FEES NECESSARY FOR CONTRACTORS USE OF PUBLIC STREETS OR ROADS, INCLUDING VEHICLE SIZE OR WEIGHT LIMITS AND STREET-CROSSING PERMITS, AS REQUIRED BY THE CITY OF NEW YORK, AND ANY OTHER AFFECTED MUNICIPALITIES AS APPROPRIATE.
5. CONTRACTOR SHALL PROVIDE ALL SUBMITTALS AS IDENTIFIED IN THE CONTRACT DOCUMENTS.
6. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES, PENALTIES, ETC. FOR FAILURE TO COMPLY.
7. THE CONTRACTOR SHALL COMPLY WITH THE NOISE MITIGATION PROVISIONS OF 15 RCNY CHAPTER 28.
8. THE CONTRACTOR SHALL MAINTAIN FENCING AROUND ALL ACTIVE CONSTRUCTION AND STAGING AREAS.
9. CONTRACTOR SHALL RESTORE ALL CONCRETE AND ASPHALT SURFACES OUTSIDE THE LIMITS OF WORK DAMAGED AS RESULT OF TEMPORARY STORAGE OF MATERIAL AND EQUIPMENT OR DUE TO CONSTRUCTION OPERATIONS.
10. CLOSING OR OBSTRUCTING OF ROADWAYS, SIDEWALKS, AND PASSAGEWAYS ADJACENT TO THE WORK BY THE PLACEMENT OR STORAGE OF MATERIALS SHALL NOT BE PERMITTED UNLESS APPROVED BY NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT), NEW YORK CITY DEPARTMENT OF BUILDINGS (NYCDOB) AND CON EDISON.
11. THE CONTRACTOR SHALL REPAIR DAMAGE THAT MAY OCCUR AS A RESULT OF ITS ACTIVITIES TO FACILITIES AND/OR STRUCTURES TO REMAIN, OR TO ANY PROPERTY BELONGING TO CON EDISON, OR OTHER STAKEHOLDERS, AT THE CONTRACTORS OWN EXPENSE.
12. CONTRACTOR SHALL IMPLEMENT DUST, VAPOR, AND ODOR CONTROL MEASURES IN ACCORDANCE WITH THE REQUIREMENTS OF THE COMMUNITY AIR MONITORING PLAN.
13. THE CROSS SECTIONS DETAIL THE NYSDEC APPROVED LIMITS OF ISS TREATMENT BASED ON THE LATERAL AND VERTICAL EXTENT OF NAPL IDENTIFIED DURING SITE INVESTIGATION ACTIVITIES. ADDITIONAL INFORMATION RELATING TO THE SITE INVESTIGATION ACTIVITIES IS PROVIDED IN THE RDR.
14. THE CROSS SECTION ALIGNMENTS PRESENTED ARE NOT DRAWN DIRECTLY THROUGH SOIL BORINGS. THE SOIL BORINGS PRESENTED ARE OFF-SET FROM THE ALIGNMENTS IN THE DIRECTION AND AT THE DISTANCE PRESENTED IN THE SOIL BORING TAG MARKERS UNDER THE SURFACE ELEVATIONS. IT IS SUGGESTED THAT THE CONTRACTOR REVIEW THESE CROSS SECTIONS IN CONJUNCTION WITH THE SOIL BORING LOGS PROVIDED IN APPENDIX D OF THE RDR TO BETTER UNDERSTAND THE OBSTRUCTIONS IDENTIFIED DURING THE INVESTIGATION PHASE OF WORK.
15. THE INTREPID PEDESTRIAN BRIDGE RECORD DRAWINGS HAVE BEEN INCLUDED IN APPENDIX F OF THE RDR FOR REFERENCE.
16. A PRE-CONSTRUCTION CONDITION SURVEY SHALL BE COMPLETED BY THE CONTRACTOR TO DOCUMENT EXISTING SITE CONDITIONS AND STRUCTURES SO THAT ALL SITE FEATURES THAT ARE PLANNED TO BE OR MAY NEED TO BE REMOVED DURING CONSTRUCTION CAN BE REPLACED IN KIND. THE PEDESTRIAN BRIDGE RECORD DRAWINGS HAVE BEEN PROVIDED IN APPENDIX F OF THE RDR FOR REFERENCE.

SURVEY:

1. BASEMAP PROVIDED BY BORBAS SURVEYING AND MAPPING LLC, INC. DATED NOVEMBER 6, 2023.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88).
4. EXISTING PROPERTY BOUNDARY AND STREET RIGHT-OF-WAY BASED ON A SURVEY BY CHAZEN ENGINEERING, LAND SURVEYING LANDSCAPE ARCHITECTURE CO., P.C. DATE OF LAST SURVEY DOCUMENT REVISION AUGUST 6, 2012.
5. HORIZONTAL AND VERTICAL DATUMS BASED ON GNSS GPS OBSERVATIONS FROM NGS CORS NETWORK AT THE TIME OF FIELD SURVEY.
6. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD.
7. CONTRACTOR SHALL PERFORM ALL SURVEYS USING A NEW YORK STATE LICENSED PROFESSIONAL LAND SURVEYOR.
8. CONTRACTOR SHALL SURVEY ALL EXPOSED UNDERGROUND UTILITIES AND STRUCTURES ENCOUNTERED DURING CONSTRUCTION.

UTILITIES:

1. THE APPROXIMATE LOCATION OF KNOWN UTILITY STRUCTURES ARE SHOWN ON THE DESIGN DRAWINGS. THE ACCURACY OF AND COMPLETENESS OF THIS INFORMATION IS NOT GUARANTEED. CONTRACTOR SHALL FIELD VERIFY THE UTILITY LOCATIONS AND OTHER CONSTRUCTION OBSTACLES PRIOR TO CONSTRUCTION.
2. ALL EXISTING UTILITY MANHOLE RIMS, VALVE BOXES, ETC., ARE TO BE RESET BY THE CONTRACTOR OR APPLICABLE UTILITY COMPANY OR AUTHORITY.
3. CONTRACTOR SHALL NOTIFY NEW YORK 811 AT (800-272-4480) PRIOR TO ANY INTRUSIVE WORK.
4. ANY UTILITY ENCOUNTERED DURING CONSTRUCTION SHALL BE ASSUMED TO BE ACTIVE AND SHALL NOT BE REMOVED, CUT OR OTHERWISE COMPROMISED IN ANY WAY UNLESS DIRECTED BY CON EDISON OR THEIR REPRESENTATIVES.

EROSION AND SEDIMENT CONTROL:

1. CONTRACTOR SHALL INSTALL ALL SOIL EROSION CONTROL MEASURES PRIOR TO THE START OF ANY GROUND INTRUSIVE WORK.
2. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH NYS STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL (NYSDEC 2016) AND ARE SUBJECT TO CON EDISON APPROVAL.
3. THE PROJECT IS SUBJECT TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) STATE POLLUTION DISCHARGE ELIMINATION SYSTEM (SPDES) FOR DISCHARGES FROM CONSTRUCTION ACTIVITY, GENERAL PERMIT. THE CONTRACTOR SHALL IMPLEMENT THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) THAT WAS PREPARED BY THE ENGINEER IN ACCORDANCE WITH THE CURRENT GENERAL PERMIT. THE CONTRACTOR SHALL PROVIDE COMPLETED/SIGNED CONTRACTOR GENERAL PERMIT CERTIFICATIONS FOR ALL CONTRACTORS INVOLVED IN SOIL DISTURBANCE ACTIVITIES PRIOR TO ANY SITE WORK BY THE PARTIES.
4. CONTRACTOR SHALL PROVIDE TEMPORARY DRAINAGE, EROSION AND SEDIMENT CONTROL AND DUST CONTROL MEASURES AS DIRECTED BY CON EDISON (OWNER) AND/OR ENGINEER AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEW YORK CITY (NYC) STORMWATER CONSTRUCTION PERMIT.

GROUNDWATER WELL ABANDONMENT:

1. GROUNDWATER MONITORING WELLS IDENTIFIED FOR ABANDONMENT SHALL BE ABANDONED BY NEW YORK STATE REGISTERED WELL DRILLER AND DOCUMENTED IN ACCORDANCE WITH NYSDEC CP-43: GROUNDWATER MONITORING WELL DECOMMISSIONING POLICY (NYSDEC 2009).

DEMOLITION:

1. DEMOLITION INCLUDES ABOVE AND BELOW GROUND STRUCTURAL CONCRETE, FOUNDATIONS, METALS, MASONRY ATTACHMENTS, APPURTENANCES, PIPING, ELECTRICAL AND MECHANICAL EQUIPMENT, PAVING, CURBS, SIDEWALKS, FENCING, PIPING AND SIMILAR EXISTING FACILITIES WITHIN REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION 01732.
2. THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION CONDITIONS SURVEY AND VERIFICATION OF THE CONDITION OF EXISTING STRUCTURES AND FACILITIES TO BE MAINTAINED. THE PRE-CONSTRUCTION CONDITIONS SURVEY SHALL CONSIST OF PHOTOGRAPHS, AND A BRIEF WRITTEN REPORT.
3. THE CONTRACTOR, AS PART OF THE CONTRACTOR'S CONSTRUCTION PLAN, SHALL SUBMIT A DEMOLITION PLAN THAT ADDRESSES METHODS, EQUIPMENT AND OPERATING SEQUENCES, INCLUDING, BUT, NOT LIMITED TO, COORDINATION FOR SHUT-OFF, CAPPING, TEMPORARY SERVICES, CONTINUATION OF UTILITY SERVICES AND OTHER APPLICABLE ITEMS TO ENSURE NO INTERRUPTION OF SERVICES.
4. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND INCIDENTALS AS INDICATED ON THE PLANS REQUIRED FOR DEMOLITIONS, MATERIAL SIZING AND MATERIAL REMOVAL AND DISPOSAL. WORK SHALL INCLUDE DEMOLITION ASSOCIATED WITH EXISTING STRUCTURES AND FACILITIES AND REMNANT SUBSURFACE STRUCTURES, PROCESS PIPING, AND FACILITIES.
5. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLITION MATERIALS AT A DISPOSAL FACILITY APPROVED BY CON EDISON.
6. THE CONTRACTOR SHALL PERFORM ALL DEMOLITION AND REMOVAL WORK TO PREVENT DAMAGE OR INJURY TO STRUCTURES ADJACENT FEATURES WHICH MAY RESULT FROM FALLING DEBRIS OR OTHER CAUSES, AND WHICH WILL INTERFERE WITH THE USE OF AND FREE AND SAFE PASSAGE TO AND FROM ADJACENT STRUCTURES.
7. THE CONTRACTOR SHALL ERECT AND MAINTAIN BARRIERS, LIGHTS, SHEDS AND OTHER NECESSARY PROTECTIVE DEVICES.
8. CONTRACTOR SHALL SEGREGATE AND MANAGE ALL DEMOLISHED CONCRETE/ASPHALT. DEMOLISHED CONCRETE/ASPHALT SHALL BE DISPOSED OF AS C&D DEBRIS MATERIALS IN ACCORDANCE WITH THE DISPOSAL FACILITIES ACCEPTANCE CRITERIA.

EXCAVATION SUPPORT:

1. THE CONTRACTOR SHALL SUBMIT A EXCAVATION SUPPORT DESIGN, DRAWINGS, AND CALCULATIONS TO THE ENGINEER FOR REVIEW AND COMMENT. EXCAVATION SUPPORT SHALL NOT BE INSTALLED UNTIL THE CONTRACTORS DESIGN SUBMITTAL HAS BEEN REVIEWED AND ACCEPTED BY THE ENGINEER AND CON EDISON. DRAWINGS AND CALCULATIONS IF REQUIRED FOR THE EXCAVATION SUPPORT DESIGN SHALL BE SIGNED AND SEALED BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER.
2. ALL EXCAVATION, TRENCHING, SHEETING, BRACING, AND RELATED ACTIVITIES SHALL FULLY COMPLY WITH THE REQUIREMENTS OF OSHA EXCAVATION SAFETY STANDARDS (29 CFR PART 1926).
3. THE SUBSURFACE SOILS ARE KNOWN TO CONTAIN REMNANT STRUCTURES, CONSTRUCTION DEBRIS AND RUBBLE IN VARYING QUANTITIES AND SIZE ALONG WITH ABANDONED AND ACTIVE SUBSURFACE UTILITIES. THE DESIGN AND INSTALLATION OF THE EXCAVATION SUPPORT MEASURES SHALL CONSIDER THE PRESENCE OF THESE OBSTRUCTIONS.

WASTE MANAGEMENT:

1. CONTRACTOR SHALL PERFORM WASTE CHARACTERIZATION FOR OFF SITE DISPOSAL.
2. TRANSPORT USING CON EDISON APPROVED TRANSPORTERS AND DISPOSAL AT A CON EDISON APPROVED DISPOSAL FACILITY.
3. EXCAVATED SOIL SHALL NOT BE REUSED AS BACKFILL.

IN-SITU STABILIZATION/SOLIDIFICATION TREATMENT

1. STABILIZATION OF SOILS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, AS APPLICABLE:
   - SPECIFICATION 02160 AUGER MIXING
   - SPECIFICATION 02161 EXCAVATOR BASED MIXING
   - SPECIFICATION 02162 JET GROUTING

WATER MANAGEMENT:

1. PRIOR TO THE COMMENCEMENT OF WORK, AS PART OF THE CONTRACTOR'S CONSTRUCTION PLAN, THE CONTRACTOR SHALL PREPARE A CONSTRUCTION WATER MANAGEMENT PLAN IN ACCORDANCE WITH TECHNICAL SPECIFICATION 02145.
2. THE CONTRACTOR SHALL PROVIDE THE PROPER PUMPS, STORAGE FACILITIES, TRANSFER PIPING, HOSES, ETC. WHICH INCLUDE SAFEGUARDS AGAINST LEAKS, FREEZING, PUNCTURES, OR BREAKAGE TO ENSURE EFFECTIVE SITE WATER MANAGEMENT.
3. CONTRACTOR SHALL DIVERT SURFACE WATER TO PREVENT ENTRY INTO THE EXCAVATION AND LIMIT DEWATERING TO THAT WHICH IS NECESSARY TO PROVIDE ADEQUATE ACCESS, A SAFE EXCAVATION IN ACCORDANCE WITH NYC BUILDING CODE REQUIREMENTS, PREVENT THE SPREAD OF CONTAMINATION, AND ENSURE THAT COMPACTION REQUIREMENTS CAN BE MET.
4. ALL DISCHARGES SHALL COMPLY WITH RULES OF THE CITY OF NEW YORK TITLE 15, CHAPTER 19 AND SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS.

RIGGING:

1. CONTRACTOR IS TO PROVIDE DOCUMENTS TO INCLUDE BUT NOT LIMITED TO, PROCEDURE, CALCULATIONS, PLOT PLANS SHOWING CRANE AND/OR EQUIPMENT LAYOUT, AND EQUIPMENT AND SHALL BE SIGNED AND SEALED BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER. THE NEW YORK STATE PROFESSIONAL ENGINEER WHO DESIGNED AND CERTIFIED THE RIGGING DOCUMENTS SHALL BE PRESENT ON SITE EACH DAY OF RIGGING.

WORK SEQUENCE:

1. THE FOLLOWING SEQUENCE OF WORK IS PROVIDED FOR GENERAL PLANNING PURPOSES ONLY, AND IS NOT INCLUSIVE OF ALL WORK TO BE PERFORMED:
   - A. OBTAIN ALL NECESSARY PERMITS
   - B. PREPARE AND SUBMIT ALL REQUIRED SUBMITTALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS
   - C. VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES WITHIN THE PROJECT WORK AREA
   - D. MOBILIZATION
   - E. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES
   - F. PERFORM SITE PREPARATION, GROUNDWATER MONITORING WELL ABANDONMENT, AND DEMOLITION ACTIVITIES
   - G. PERFORM SOIL EXCAVATION
   - H. PERFORM IN-SITU STABILIZATION/SOLIDIFICATION TREATMENT
   - I. PERFORM BACKFILL
   - J. PERFORM SITE GRADING
   - K. PERFORM SITE COVER SYSTEM INSTALLATION
   - L. SITE RESTORATION
   - M. DEMOBILIZATION
2. THE CONTRACTOR SHALL COORDINATE THE SEQUENCING OF ALL WORK ACTIVITIES WITH CON EDISON AND OTHER STAKEHOLDERS.

REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. G-002 - D
DWG. SIZE D | DWG. TYPE COMPANY | SHT. 2
CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	NONE
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
GENERAL LEGEND, NOTES, AND ABBREVIATIONS

SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-G-002
SHEET No. 2 OF 17

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: (\\nysvr04fs01) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\GENERAL\453607-G-002 GENERAL NOTES AND LEGEND.DWG, DATE: 03/27/2026 08:43:20AM, p0015477

LAYOUT POINTS, COORDINATES AND ELEVATIONS						
POINT NUMBER	NORTHING	EASTING	EXISTING GRADE	3.5 FOOT DEPTH	15 FOOT DEPTH	30 FOOT DEPTH
7	217605.61	984780.05	13.5	10.0		-16.5
8	217599.80	984790.29	13.6	10.1		-16.4
9	217597.89	984774.73	13.3	9.8		-16.7
10	217592.97	984763.34	13.1	9.6		-16.9
11	217588.45	984772.45	13.2	9.7		-16.8
12	217577.11	984754.62	12.7	9.2		-17.3
13	217584.18	984733.71	12.4	8.9		-17.6
14	217574.74	984750.89	12.6	9.1		-17.4
15	217576.72	984729.58	12.4	8.9		-17.6
16	217569.49	984742.63	12.5	9.0		-17.5
17	217574.09	984835.52	14.4	10.9		-15.6
18	217552.74	984874.67	14.8	11.3	-0.2	
19	217567.01	984831.40	14.2	10.7	-0.8	-15.8
20	217499.88	984857.75	14.1	10.6	-0.9	-15.9
21	217509.13	984876.95	14.4	10.9	-0.6	
22	217478.61	984860.08	14.0	10.5		-16.0
23	217473.18	984869.46	14.6	11.1		-15.4
24	217459.46	984861.85	14.4	10.9		-15.6
25	217453.50	984856.83	14.3	10.8		-15.7
26	217461.90	984771.29	12.2	8.7	-2.8	-17.8
27	217434.24	984821.20	13.1	9.6	-1.9	-16.9
28	217420.30	984748.22	11.8	8.3		-18.2
29	217370.01	984811.11	12.6	9.1	-2.4	
30	217441.98	984709.12	11.4	7.9	-3.6	
31	217472.82	984726.22	11.5	8.0	-3.5	
32	217510.65	984728.00	11.5	8.0	-3.5	
33	217540.95	984717.88	11.5	8.0	-3.5	
34	217561.64	984680.54	11.2	7.7	-3.8	
35	217546.31	984629.50	10.6	7.1	-4.4	

LAYOUT POINTS, COORDINATES AND ELEVATIONS						
POINT NUMBER	NORTHING	EASTING	EXISTING GRADE	3.5 FOOT DEPTH	15 FOOT DEPTH	30 FOOT DEPTH
36	217527.39	984618.32	10.4	6.9		-19.6
37	217516.06	984662.34	10.8	7.3		-19.2
38	217496.03	984638.28	10.6	7.1		-19.4
39	217504.64	984604.88	10.2	6.7		-19.8
40	217489.53	984595.94	10.2	6.7		-19.8
41	217561.73	984858.19	14.7	11.2	-0.3	-15.3
42	217561.59	984848.67	14.7	11.2		-15.3
43	217545.61	984863.94	14.4	10.9	-0.6	-15.6
44	217533.39	984853.92	14.1	10.6	-0.9	
45	217493.93	984868.55	14.2	10.7		-15.8
46	217450.87	984830.69	13.4	9.9		-16.6
47	217446.02	984839.45	13.6	10.1		-16.4
48	217442.16	984825.77	13.2	9.7		-16.8
49	217437.27	984834.60	13.4	9.9		-16.6
50	217425.65	984816.44	12.9	9.4	-2.1	-17.1
51	217436.79	984780.55	12.3	8.8	-2.7	-17.7
52	217399.36	984827.18	13.4	9.9	-1.6	-16.6
53	217414.90	984768.42	12.0	8.5	-3.0	-18.0
54	217383.55	984800.57	12.5	9.0	-2.5	-17.5
55	217377.67	984797.31	12.4	8.9	-2.6	-17.6
56	217434.14	984720.82	11.5	8.0		-18.5
57	217429.30	984729.56	11.6	8.1		-18.4
58	217425.39	984715.97	11.5	8.0		-18.5
59	217420.55	984724.72	11.6	8.1		-18.4
60	217437.84	984716.58	11.5	8.0	-3.5	-18.5
61	217426.12	984710.09	11.5	8.0	-3.5	-18.5
62	217438.26	984687.74	11.3	7.8	-3.7	-18.7
63	217469.51	984671.50	11.0	7.5		-19.0
64	217464.66	984680.25	11.1	7.6		-18.9

LAYOUT POINTS, COORDINATES AND ELEVATIONS						
POINT NUMBER	NORTHING	EASTING	EXISTING GRADE	3.5 FOOT DEPTH	15 FOOT DEPTH	30 FOOT DEPTH
65	217460.76	984666.66	11.0	7.5		-19.0
66	217455.91	984675.41	11.1	7.6		-18.9
67	217491.42	984726.53	11.5	8.0	-3.5	-18.5
68	217553.85	984691.72	11.3	7.8	-3.7	-18.7
69	217545.01	984628.73	10.6	7.1	-4.4	-19.4
70	217542.20	984627.06	10.6	7.1		-19.4
71	217538.40	984633.92	10.8	7.3		-19.2
72	217533.58	984621.98	10.5	7.0		-19.5
73	217529.65	984629.08	10.7	7.2		-19.3
74	217553.89	984677.37	11.2	7.7	-3.8	
75	217549.04	984686.12	11.2	7.7		-18.8
76	217545.14	984672.53	11.1	7.6		-18.9
77	217540.30	984681.27	11.1	7.6		-18.9

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER

453607

DWG. NO. G-003 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 3

CON EDISON

LOCATION MANHATTAN

TITLE

FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	NONE
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
LAYOUT POINTS

SEAL & SIGNATURE

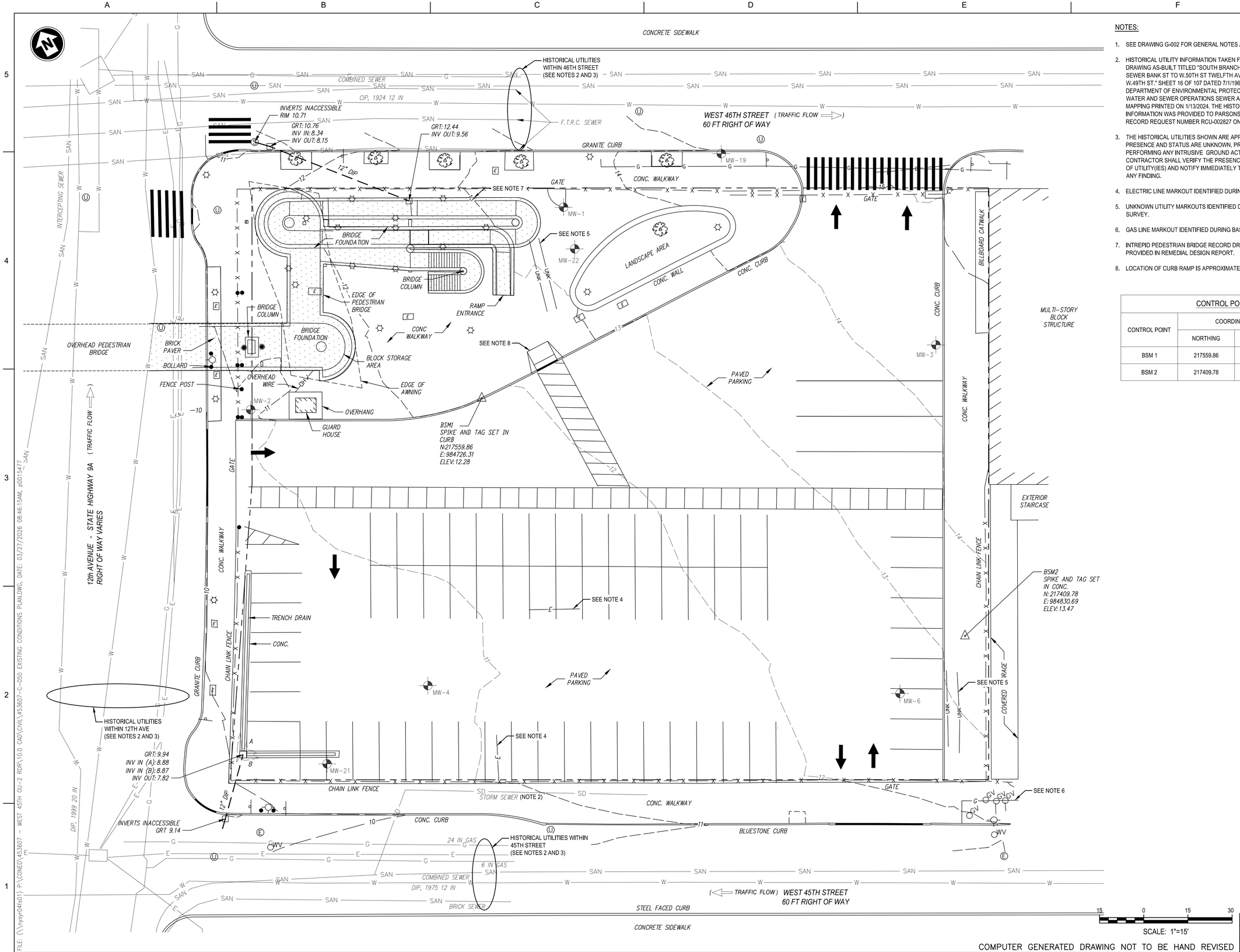
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-G-003
SHEET No. 3 OF 17

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN any WAY.

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: (\\nysvr04fs01) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\GENERAL\453607-G-003 LAYOUT POINTS.DWG, DATE: 03/27/2026 10:58:55AM, p0015477



NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HISTORICAL UTILITY INFORMATION TAKEN FROM RECORD DRAWING AS-BUILT TITLED "SOUTH BRANCH INTERCEPTING SEWER BANK ST TO W.50TH ST TWELFTH AVE - W.45 ST TO W.49TH ST." SHEET 16 OF 107 DATED 7/1/1968 AND THE NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WATER AND SEWER OPERATIONS SEWER AND WATER LINE MAPPING PRINTED ON 1/13/2024. THE HISTORICAL UTILITY INFORMATION WAS PROVIDED TO PARSONS VIA ELECTRONIC RECORD REQUEST NUMBER RCU-002827 ON 1/13/2024.
3. THE HISTORICAL UTILITIES SHOWN ARE APPROXIMATE, PRESENCE AND STATUS ARE UNKNOWN, PRIOR TO PERFORMING ANY INTRUSIVE GROUND ACTIVITIES, CONTRACTOR SHALL VERIFY THE PRESENCE AND CONDITION OF UTILITY(IES) AND NOTIFY IMMEDIATELY THE ENGINEER OF ANY FINDING.
4. ELECTRIC LINE MARKOUT IDENTIFIED DURING BASE SURVEY.
5. UNKNOWN UTILITY MARKOUTS IDENTIFIED DURING BASE SURVEY.
6. GAS LINE MARKOUT IDENTIFIED DURING BASE SURVEY.
7. INTREPID PEDESTRIAN BRIDGE RECORD DRAWINGS ARE PROVIDED IN REMEDIAL DESIGN REPORT.
8. LOCATION OF CURB RAMP IS APPROXIMATE.

CONTROL POINT TABLE

CONTROL POINT	COORDINATES		ELEVATION
	NORTHING	EASTING	
BSM 1	217559.86	984726.31	12.28
BSM 2	217409.78	984830.69	13.47

REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-050 - D
DWG. SIZE D | DWG. TYPE COMPANY | SHT. 4
CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
EXISTING CONDITIONS PLAN

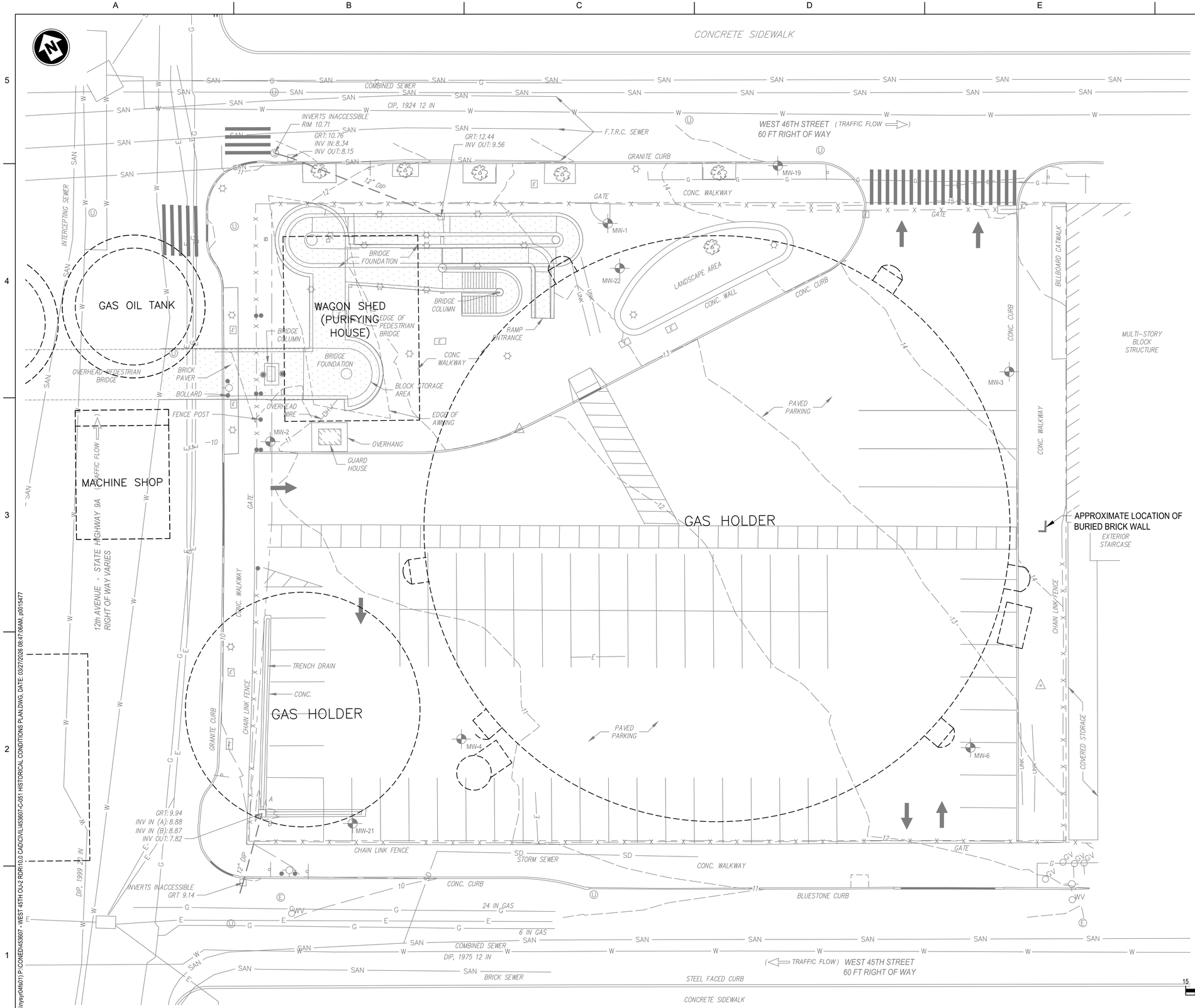
SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-050
SHEET No. 4 OF 17

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FILE: (\\nyeyc04fs01) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-050 EXISTING CONDITIONS PLAN.DWG, DATE: 03/27/2026 08:46:15AM, p0015477_SAN



LEGEND:

HISTORICAL STRUCTURE (NOTE 2)

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. LOCATIONS OF HISTORICAL STRUCTURES SHOWN FOR INFORMATION ONLY, ARE APPROXIMATE AND MAY OR MAY NOT BE PRESENT IN THE SUBSURFACE.
3. STRUCTURES FOUND IN ISS TREATMENT AREAS SHOULD BE ADDRESSED AS AN OBSTRUCTION - EITHER REMOVED IF POSSIBLE OR ISS IN PLACE.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR PRELIMINARY REMEDIAL DESIGN COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR PRELIMINARY REMEDIAL DESIGN COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER 453607

DWG. NO. C-051 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 5

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
HISTORICAL CONDITIONS PLAN

SEAL & SIGNATURE

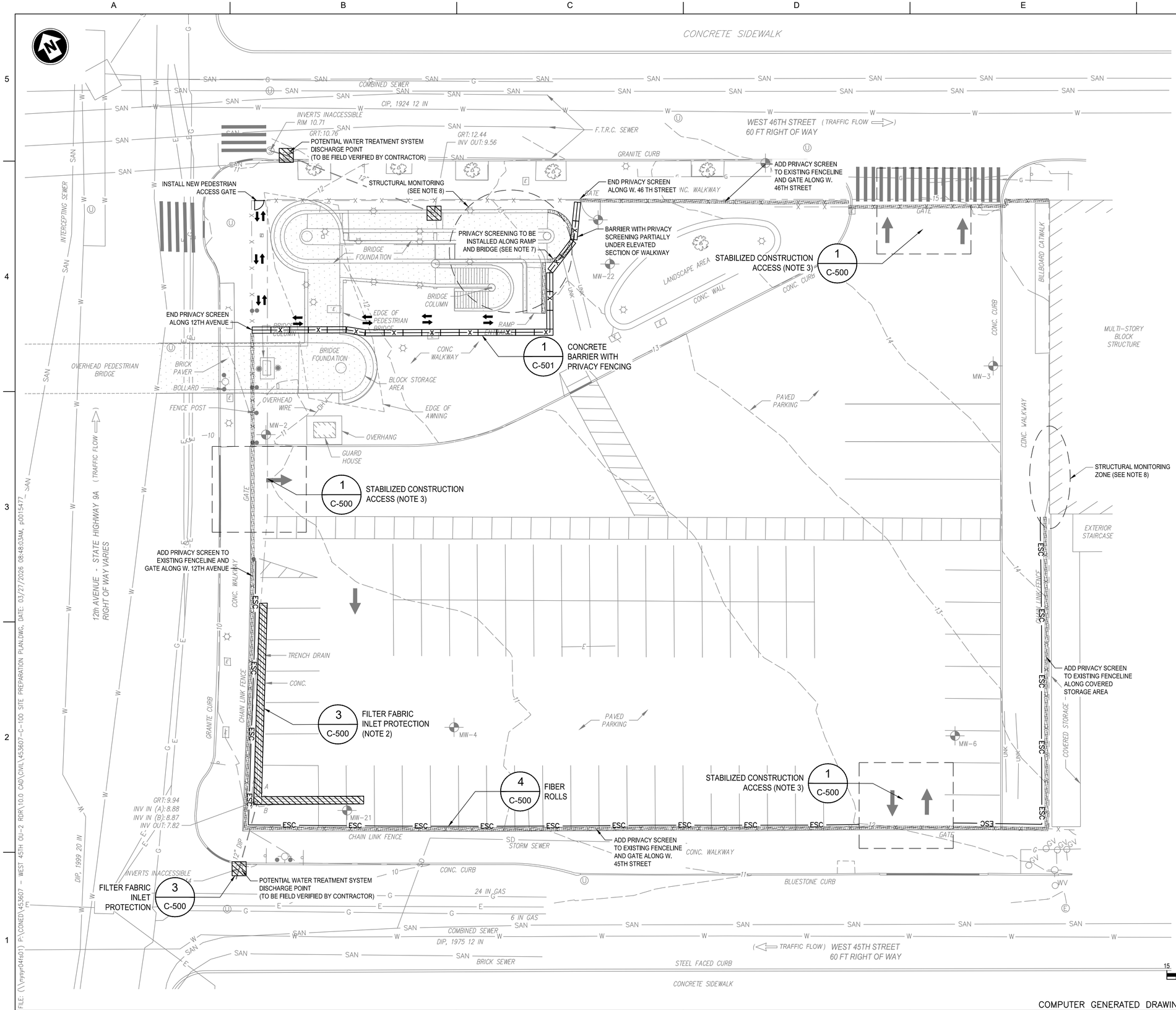
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-051
SHEET No. 5 OF 17

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COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: I:\nyeyor04\601) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-051 HISTORICAL CONDITIONS PLAN.DWG, DATE: 03/27/2026 08:47:08AM, p0015477



LEGEND:

- ESC — EROSION AND SEDIMENT CONTROLS
- PROPOSED INLET PROTECTION
- CONCRETE BARRIER WITH PRIVACY FENCING
- PRIVACY SCREENING
- PEDESTRIAN ACCESS TO BRIDGE RAMP

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. CONTRACTOR TO PROVIDE INLET PROTECTION UNTIL TRENCH DRAIN IS IMPACTED BY THE ACTIVE PHASE OF WORK.
3. STABILIZED CONSTRUCTION ACCESS FEATURES SHALL BE INSTALLED FOLLOWING PAVEMENT REMOVAL AS IDENTIFIED ON DRAWING C-101 DEMOLITION PLAN.
4. CONTRACTOR SHALL CONTROL SITE ACCESS IN ACCORDANCE WITH THE PROJECT TRAFFIC CONTROL PLAN AND IN COORDINATION WITH INTREPID MUSEUM AND CON EDISON. TRAFFIC CONTROLS SHALL INCLUDE DEDICATED FLAGGERS AT ALL ENTRY/EXIT POINTS AT ALL TIMES DURING CONSTRUCTION.
5. A PRE-CONSTRUCTION CONDITION SURVEY SHALL BE COMPLETED BY THE CONTRACTOR TO DOCUMENT EXISTING SITE CONDITIONS AND STRUCTURES SO THAT ALL SITE FEATURES THAT ARE PLANNED TO BE OR MAY NEED TO BE REMOVED DURING CONSTRUCTION CAN BE REPLACED IN KIND.
6. STRUCTURAL MONITORING FOR THE SETTLEMENT, VIBRATION, AND HORIZONTAL MOVEMENT OF THE OFFSITE AND/OR ADJACENT STRUCTURES SHALL BE INSTALLED IN ACCORDANCE WITH NEW YORK CITY BUILDING CODES.
7. CONTRACTOR SHALL INSTALL PRIVACY SCREENING TO THE PROJECT SIDE OF THE RAMP AND BRIDGE. SEE PROJECT SPECIFICATION 01510. PRIVACY SCREEN SHALL BE SUPPLEMENTED WITH TEMPORARY IMPERMEABLE SCREENING WHEN WORK IS BEING CONDUCTED IMMEDIATELY ADJACENT TO PEDESTRIAN ACCESS POINTS TO MITIGATE THE RISK OF INCIDENT OR INJURY FROM SPLASHING OR STRUCK BY HAZARD.
8. PRIOR TO THE START OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION CONDITION SURVEY OF THE ADJACENT BUILDING AND THE PEDESTRIAN BRIDGE. THE ENGINEER WILL BE RESPONSIBLE FOR PERFORMING A POST-CONSTRUCTION CONDITIONS SURVEY AT PROJECT CLOSE. DURING CONSTRUCTION, THE CONTRACTOR SHALL PERFORM STRUCTURAL MONITORING IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION SECTION 13091 - STRUCTURAL INSTRUMENTATION AND MONITORING.
9. CONTRACTOR SHALL ESTABLISH TEMPORARY FACILITIES ON SITE, INCLUDING BUT NOT LIMITED TO, TEMPORARY OFFICE(S), STAGING AREA(S), CONSTRUCTION WATER TREATMENT SYSTEM, AND DECONTAMINATION PAD(S). THE LOCATION OF THESE TEMPORARY FACILITIES WILL BE SELECTED BY THE CONTRACTOR BASED ON THEIR PROPOSED SEQUENCING OF REMEDIATION AND MAY BE REQUIRED TO BE RELOCATED AS NECESSARY BASED ON REMEDIAL OPERATIONS.

REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-100 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 6

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
SITE PREPARATION PLAN

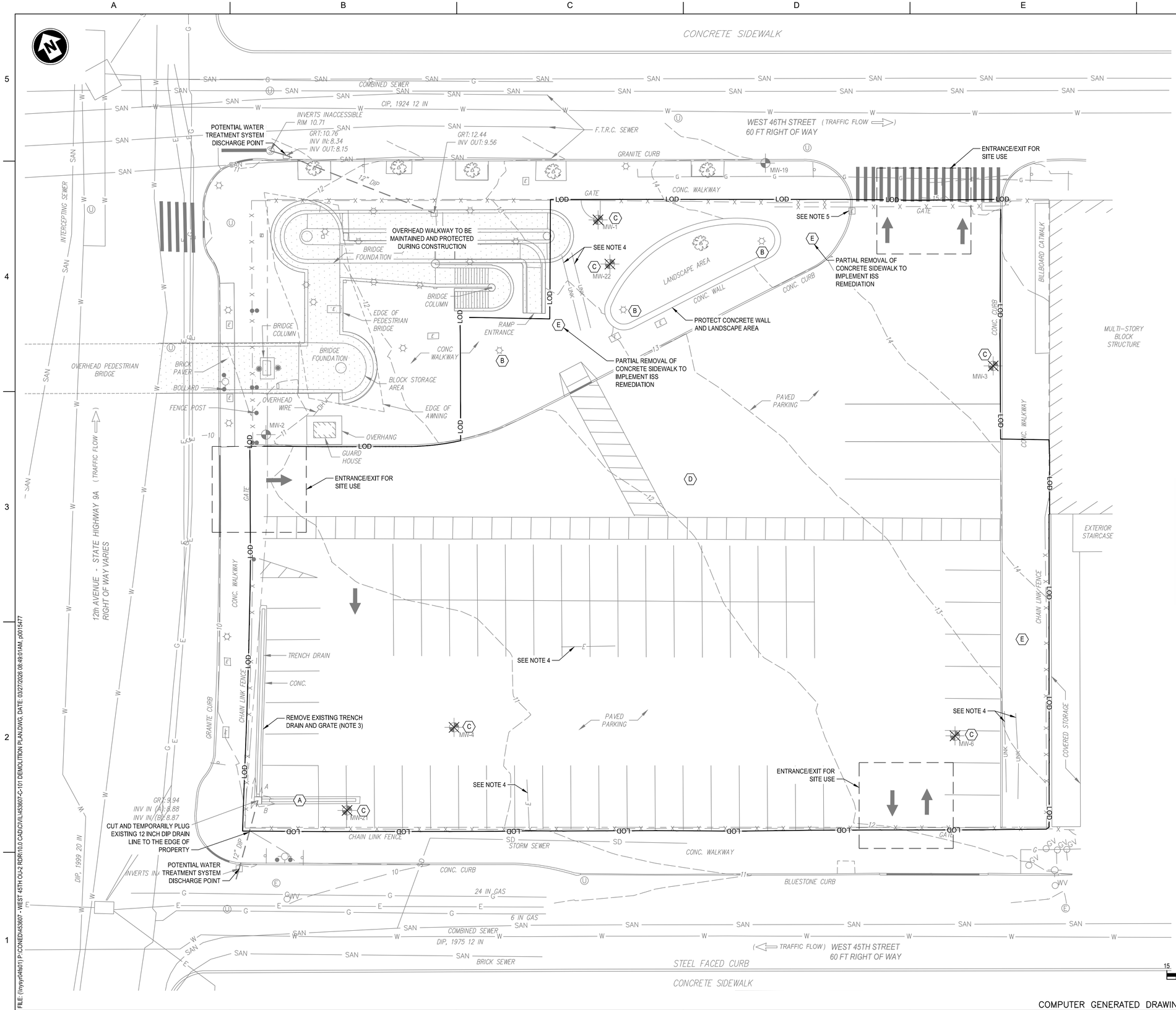
SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-100
SHEET No. 6 OF 17

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COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: I:\Vyspw\04\s01\P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-100 SITE PREPARATION PLAN.DWG, DATE: 03/27/2026 08:48:03AM, p0015477



LEGEND:

- LOD — LIMITS OF DISTURBANCE
- MW-1 — MONITORING WELL TO BE ABANDONED
- MW-2 — MONITORING WELL TO REMAIN
- (A) — DEMOLITION SCHEDULE ID

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. MONITORING WELLS SHALL BE ABANDONED IN ACCORDANCE WITH NYSDEC CP-43: GROUNDWATER MONITORING WELL DECOMMISSIONING POLICY, DATED NOVEMBER 3, 2009.
3. PRIOR TO REMOVAL CONTRACTOR SHALL DOCUMENT EXISTING TRENCH DRAIN INVERTS, DIMENSIONS ETC. FOR LATER RE-INSTALLATION DURING SITE RESTORATION.
4. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL UTILITIES, INCLUDING IDENTIFICATION OF UNKNOWN UTILITIES. CONTRACTOR SHALL COORDINATE RELOCATION OF UTILITIES, AS NEEDED, WITH PROPERTY OWNER AND SERVICE PROVIDER.
5. CONTRACTOR SHALL VERIFY ELECTRIC SOURCE AND LINE WORK FOR GATE SYSTEM.
6. CONTRACTOR SHALL VERIFY ELECTRIC SOURCE AND LINE WORK FOR LANDSCAPE LIGHTING AND IRRIGATION SYSTEM. CONTRACTOR SHALL REMOVE AND STORE LIGHT FIXTURES FOR REINSTALLATION AT TIME OF RESTORATION.
7. CONTRACTOR SHALL REMOVE ASPHALT PAVEMENT LOCATED WITHIN THE LIMITS OF DISTURBANCE. CONTRACTOR SHALL PROVIDE PLANS FOR PARTIAL REMOVAL OF CONCRETE SIDEWALKS TO IMPLEMENT ISS REMEDIATION.
8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY STRUCTURES, SITE FEATURES, OR FACILITIES LOCATED ON THE PROJECT SITE THAT ARE NOT IDENTIFIED IN THE DEMOLITION SCHEDULE.

DEMOLITION SCHEDULE

ITEM NUMBER	ID	DESCRIPTION
1	(A)	TRENCH DRAIN (NOTE 3)
2	(B)	LIGHT POSTS (NOTE 6)
3	(C)	MONITORING WELLS (NOTE 2)
4	(D)	ASPHALT PAVEMENT (NOTE 7)
5	(E)	CONCRETE SIDEWALKS (NOTE 7)

WELL ABANDONMENT

POINT NUMBER	NORTHING	EASTING	DESCRIPTION
1	217603.11	984782.05	MW-1
2	217588.91	984778.51	MW-22
3	217500.98	984869.95	MW-3
4	217403.41	984801.92	MW-6
5	217483.48	984663.05	MW-4
6	217476.82	984620.25	MW-21

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
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ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER 453607

DWG. NO. C-101 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 7

CON EDISON | LOCATION MANHATTAN

TITLE: FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
DEMOLITION PLAN

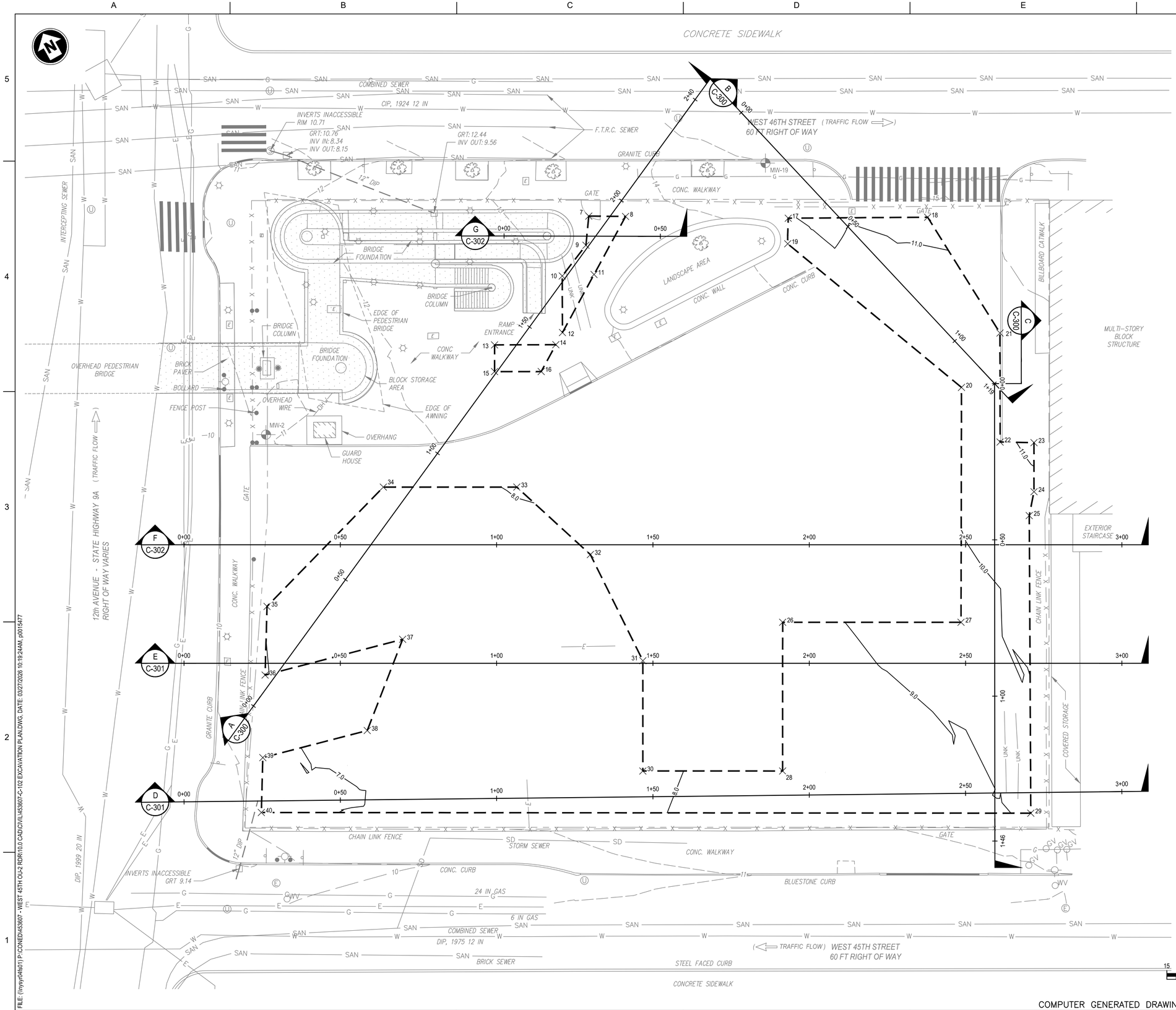
SEAL & SIGNATURE

NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-101
SHEET No. 7 OF 17

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FILE: I:\nyeyn04\601) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-101 DEMOLITION PLAN.DWG, DATE: 03/27/2026 08:49:01 AM, p0015477



LEGEND:

- PROPOSED LIMITS OF EXCAVATION (NOT INCLUDING POTENTIAL SLOPING)
- 7.0 — EXCAVATION CONTOUR FOLLOWING REMOVAL (NOTE 2)
- × 27 — ISS AREA LAYOUT POINT (NOTE 4)

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. EXCAVATION DEPTHS GREATER THAN 4 FEET SHALL BE MANAGED IN ACCORDANCE WITH OSHA REGULATION 29 CFR 1926.
3. SEE DRAWING G-003 FOR LAYOUT POINTS.
4. THE CROSS SECTION ALIGNMENTS PRESENTED ARE NOT DRAWN DIRECTLY THROUGH SOIL BORINGS. THE SOIL BORINGS PRESENTED ARE OFF-SET FROM THE ALIGNMENTS IN THE DIRECTION AND AT THE DISTANCE PRESENTED IN THE SOIL BORING TAG MARKERS UNDER THE SURFACE ELEVATIONS. IT IS SUGGESTED THAT THE CONTRACTOR REVIEW THESE CROSS SECTIONS IN CONJUNCTION WITH THE SOIL BORING LOGS PROVIDED IN APPENDIX D OF THE RDR TO BETTER UNDERSTAND THE OBSTRUCTIONS IDENTIFIED DURING THE INVESTIGATION PHASE OF WORK.
5. CONTOURS SHOWN REPRESENT A 3.5 FOOT EXCAVATION DEPTH FROM EXISTING GRADE.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER 453607

DWG. NO. C-102 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 8

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
EXCAVATION PLAN

SEAL & SIGNATURE

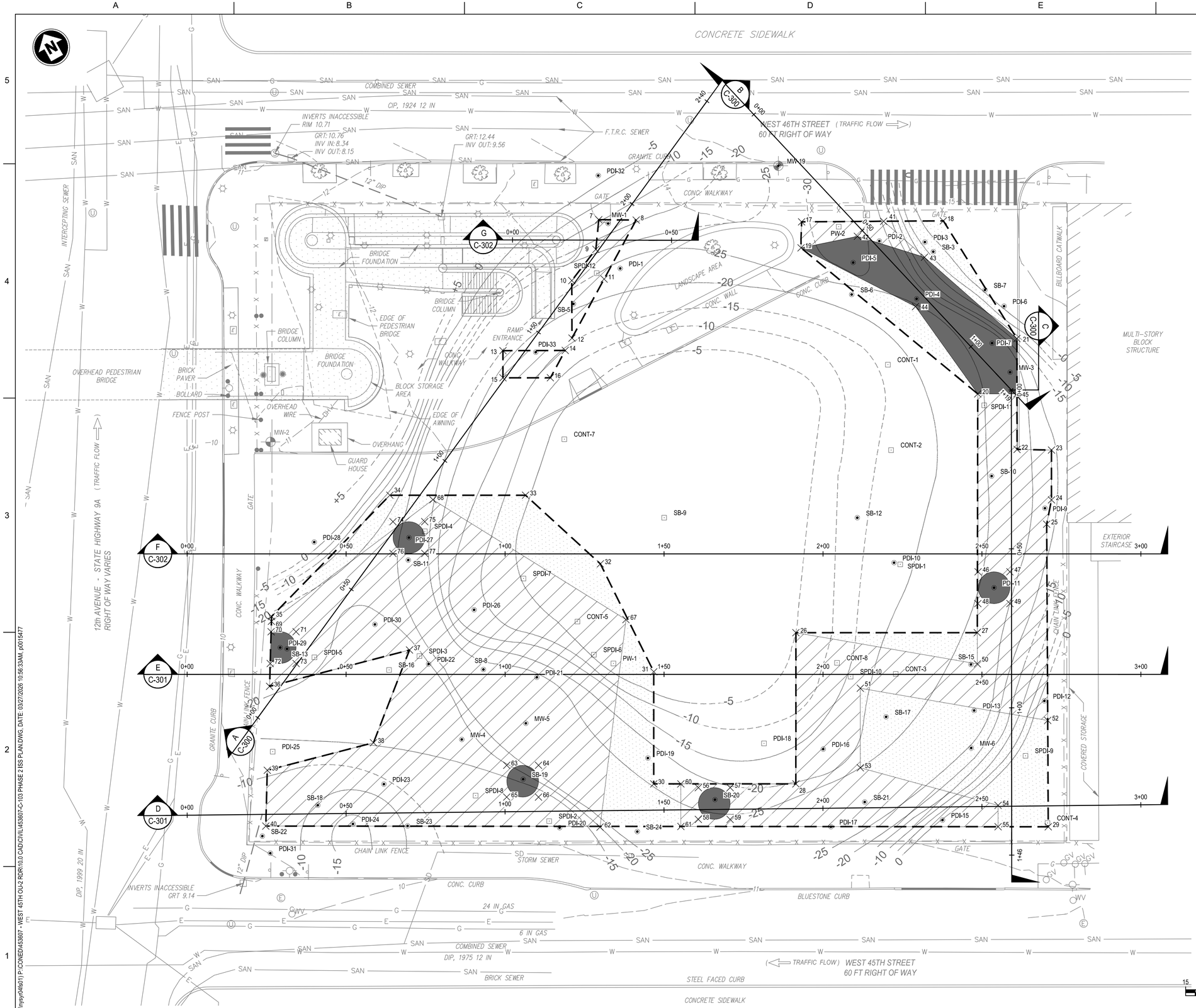
NOT FOR BIDDING OR CONSTRUCTION

DATE:	3/27/26
PROJECT No.:	453607-01000
DRAWING BY:	JN
CHK BY:	MBB
DOB DWG No:	453607-C-102
SHEET No.	8 OF 17

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FILE: I:\nysv\04f491\P:\CONED\453607 - WEST 45TH OU-2 RDR\18.0 CAD\CIVIL\453607-C-102 EXCAVATION PLAN.DWG, DATE: 03/27/2026 10:19:24AM, p0015477



LEGEND:

- PROPOSED LIMITS OF EXCAVATION (NOT INCLUDING POTENTIAL SLOPING)
- PROPOSED ISS TO 15 FT BGS, OR BEDROCK, WHICHEVER IS ENCOUNTERED FIRST (SEE NOTE 6)
- PROPOSED ISS TO 30 FT BGS, OR BEDROCK, WHICHEVER IS ENCOUNTERED FIRST (SEE NOTE 6)
- PROPOSED ISS TO BEDROCK (SEE NOTE 6)
- BEDROCK ELEVATION CONTOUR
- INFERRED BEDROCK ELEVATION CONTOUR
- PDI-3 — BORING LOCATION
- SB-9 — BORING LOCATION (NO SPT DATA)
- 27 — ISS AREA LAYOUT POINT (NOTE 4)

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. BEDROCK ELEVATION CONTOURS ARE APPROXIMATE AND BASED ON SITE CHARACTERIZATION AND PRE-DESIGN INVESTIGATION SOIL BORINGS AND TEST PITS (PRE-DESIGN INVESTIGATION SUMMARY REPORT FOR THE FORMER WEST 45TH STREET GAS WORKS SITE - OPERABLE UNIT NO. 2 SEPTEMBER 2012).
3. CONTRACTOR SHALL FIELD VERIFY BEDROCK ELEVATIONS IN AREAS WHERE ISS IS TO EXTEND INTO BEDROCK, AS PRESENTED IN CONTRACTORS ISS WORK PLAN.
4. SEE DRAWING G-003 FOR LAYOUT POINTS.
5. THE CROSS SECTION ALIGNMENTS PRESENTED ARE NOT DRAWN DIRECTLY THROUGH SOIL BORINGS. THE SOIL BORINGS PRESENTED ARE OFF-SET FROM THE ALIGNMENTS IN THE DIRECTION AND AT THE DISTANCE PRESENTED IN THE SOIL BORING TAG MARKERS UNDER THE SURFACE ELEVATIONS. IT IS SUGGESTED THAT THE CONTRACTOR REVIEW THESE CROSS SECTIONS IN CONJUNCTION WITH THE SOIL BORING LOGS PROVIDED IN APPENDIX D OF THE RDR TO BETTER UNDERSTAND THE OBSTRUCTIONS IDENTIFIED DURING THE INVESTIGATION PHASE OF WORK.
6. THE HORIZONTAL AND VERTICAL LIMITS OF ISS TREATMENT ARE BASED ON THE EVALUATION OF THE NATURE AND EXTENT OF NAPL CONDUCTED DURING THE SITE CHARACTERIZATION (PARSONS 2003, 2006) AND APPROVED BY THE NYSDEC, AS DETAILED IN THE DECISION DOCUMENT (JULY 2021). THE HORIZONTAL AND VERTICAL EXTENTS APPROVED BY THE NYSDEC ADDRESS SOILS THAT WERE IDENTIFIED DURING INVESTIGATION ACTIVITIES TO CONTAIN MGP-RELATED IMPACTS (PRIMARILY IN THE FORM OF NAPL-SATURATED SOIL). REFER TO THE REMEDIAL DESIGN REPORT (PARSONS 2026) FOR MORE INFORMATION.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER

453607

DWG. NO. C-103 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 9

CON EDISON | LOCATION MANHATTAN

TITLE

FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
ISS PLAN

SEAL & SIGNATURE

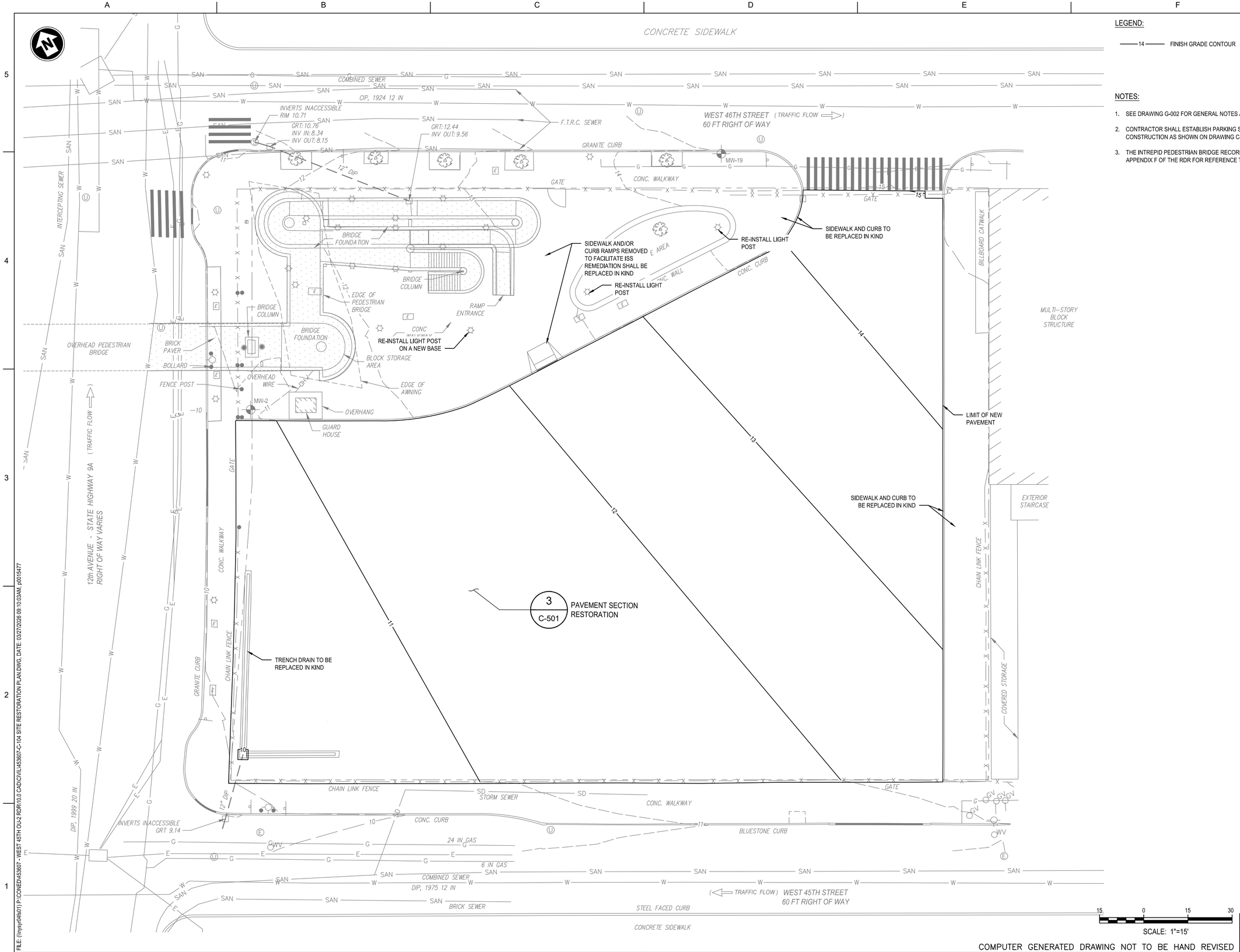
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-103
SHEET No. 9 OF 17

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COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: I:\nysv\04\491\P\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-103 PHASE 2 ISS PLAN DWG, DATE: 03/27/2026 10:56:33AM, p0015477



LEGEND:

14 FINISH GRADE CONTOUR

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. CONTRACTOR SHALL ESTABLISH PARKING SPACE STRIPING UPON COMPLETION OF CONSTRUCTION AS SHOWN ON DRAWING C-105.
3. THE INTREPID PEDESTRIAN BRIDGE RECORD DRAWINGS HAVE BEEN INCLUDED IN APPENDIX F OF THE RDR FOR REFERENCE TO AS-BUILT CONDITIONS.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER

453607

DWG. NO. C-104 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 10

CON EDISON | LOCATION MANHATTAN

TITLE

FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
SITE RESTORATION PLAN

SEAL & SIGNATURE

NOT FOR BIDDING OR CONSTRUCTION

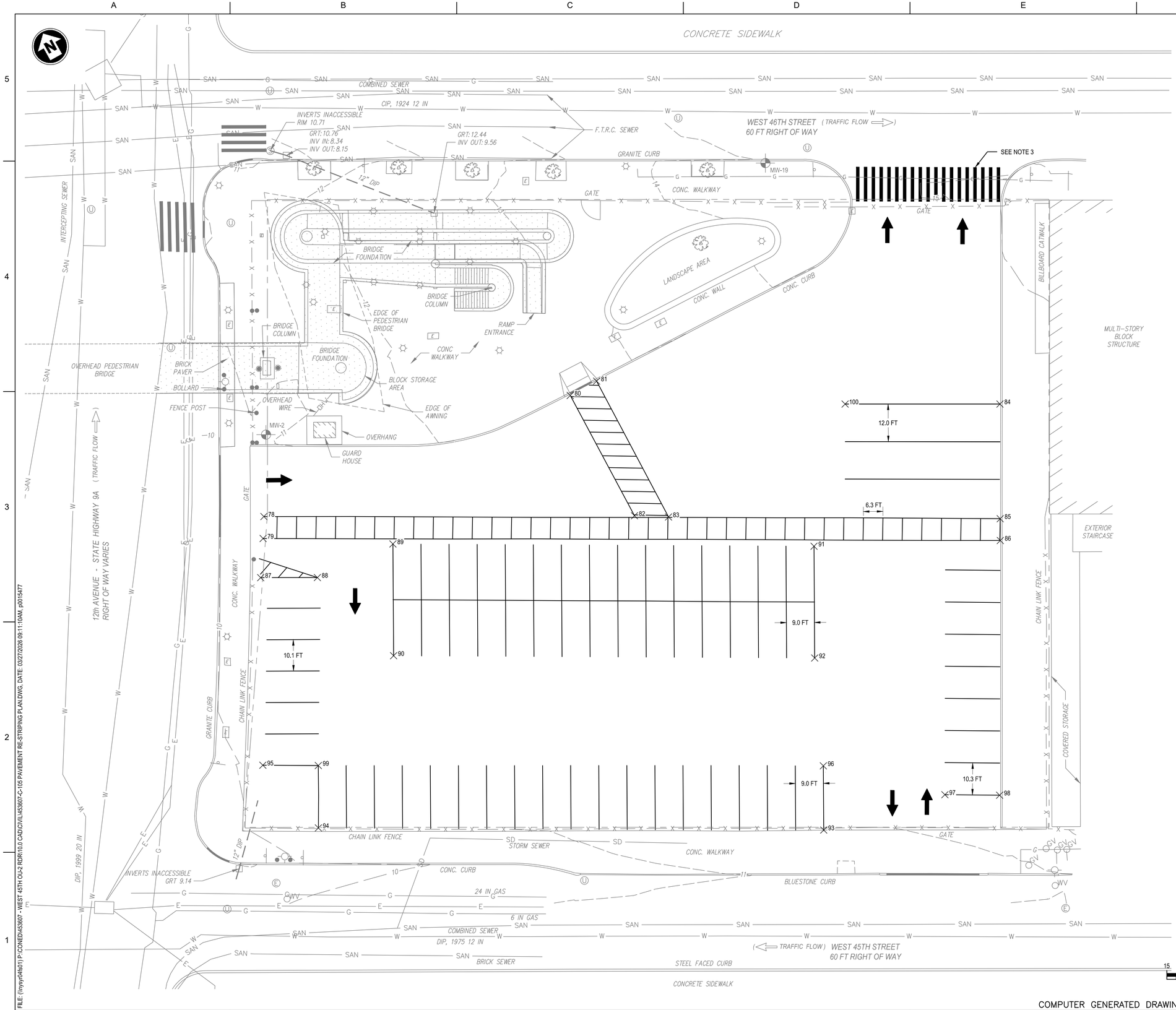
DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-104
SHEET No. 10 OF 17

SCALE: 1"=15'

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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FILE: I:\nysv\04f491\P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-104 SITE RESTORATION PLAN.DWG, DATE: 03/27/2026 09:10:03AM, p0015477



LEGEND:

- ✕ 78 — STRIPING LAYOUT POINT
- → — WHITE ARROW PAVEMENT SYMBOL

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. CONTRACTOR SHALL RE-ESTABLISH PARKING LOT STRIPING AND WHITE ARROW PAVEMENT SYMBOLS UPON COMPLETION OF CONSTRUCTION WITH EXTRUDED THERMOPLASTIC REFLECTORIZED MARKINGS 727-01 SOURCED FROM NYSDOT APPROVED LIST - PAVEMENT MARKING MATERIALS.
3. CONTRACTOR SHALL RE-PAINT CROSSWALK STRIPING FOLLOWING COMPLETION OF CONSTRUCTION.

STRIPING LAYOUT TABLE

POINT NUMBER	NORTHING	EASTING
78	217571.93	984642.56
79	217565.91	984638.93
80	217558.31	984747.04
81	217558.22	984756.64
82	217514.68	984746.37
83	217509.04	984755.70
84	217489.26	984865.94
85	217457.14	984848.22
86	217451.02	984844.88
87	217555.33	984632.19
88	217546.57	984648.06
89	217544.25	984674.40
90	217512.88	984657.26
91	217478.31	984791.86
92	217446.94	984774.72
93	217397.40	984750.56
94	217476.37	984609.52
95	217502.52	984603.69
96	217415.43	984760.42
97	217388.50	984789.94
98	217379.87	984805.18
99	217493.83	984619.17
100	217513.27	984822.61

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER 453607

DWG. NO. C-105 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 11

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	1" = 15'
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
PAVEMENT RE-STRIPING PLAN

SEAL & SIGNATURE

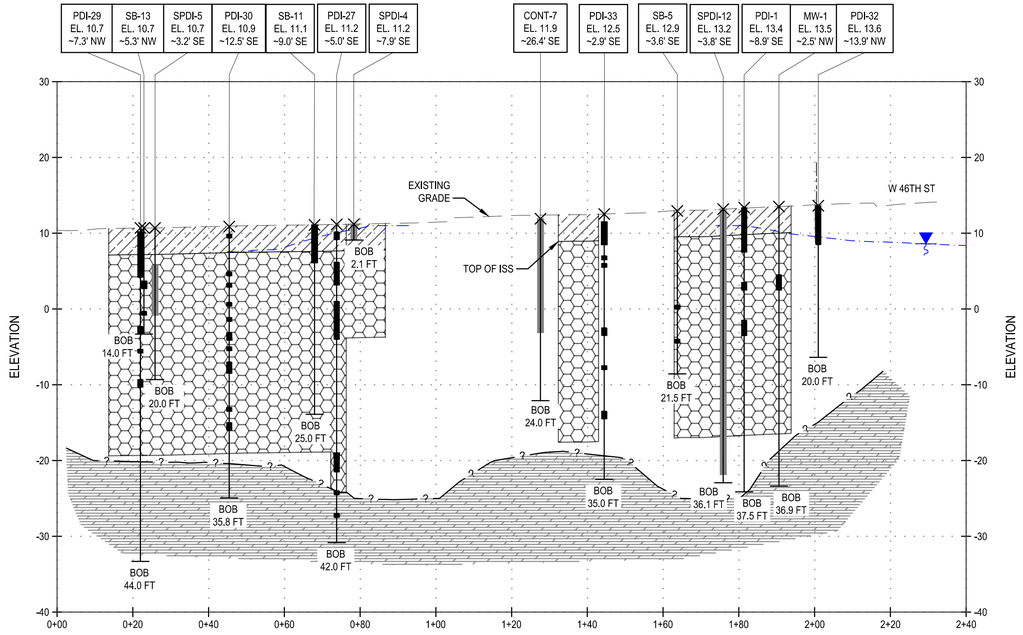
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-105
SHEET No. 11 OF 17

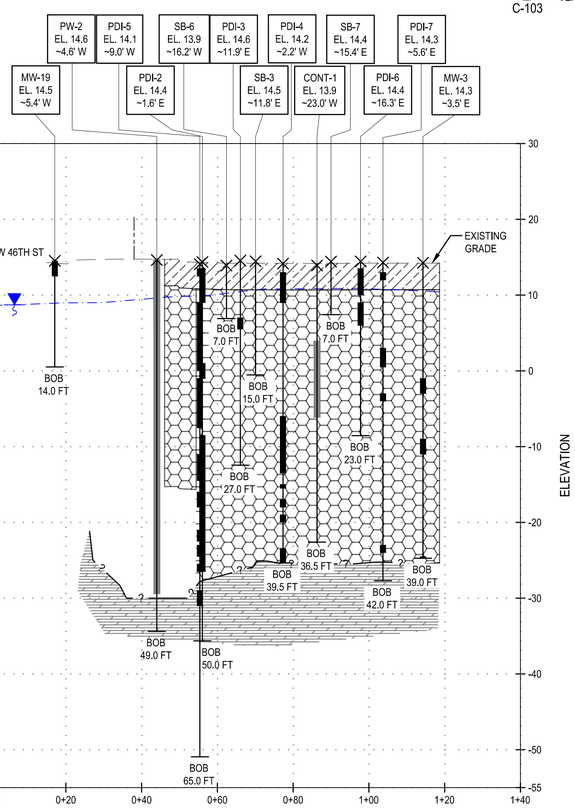
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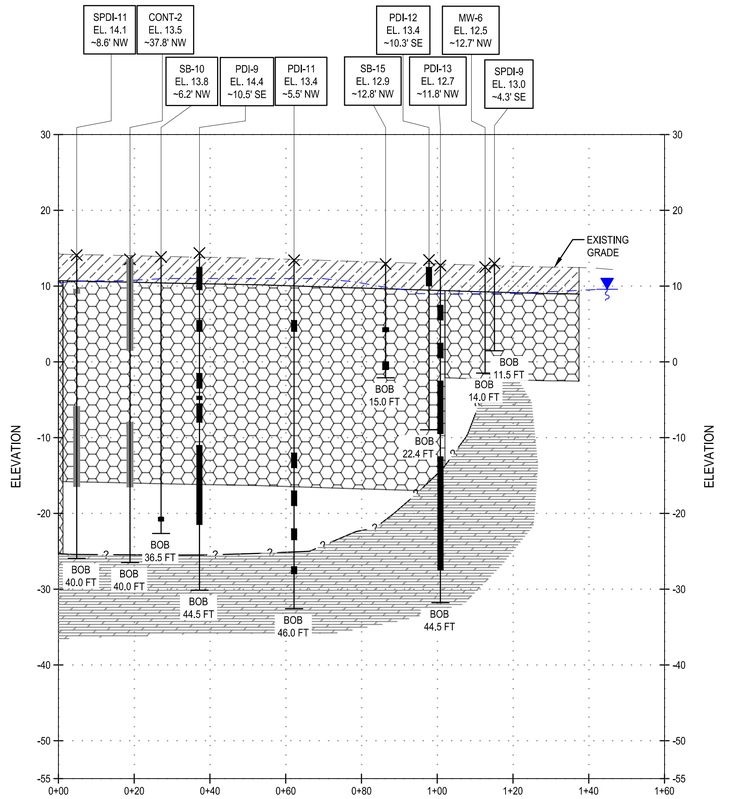
FILE: I:\nyeyn04\601) P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-105 PAVEMENT RE-STRIPING PLAN.DWG, DATE: 03/27/2026 09:11:10AM, p0015477



A
C-102
C-103
CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



B
C-102
C-103
CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



C
C-102
C-103
CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'

LEGEND:

- EXISTING GRADE
- GROUNDWATER (MARCH/JULY 2012)
- APPROXIMATE TOP OF BEDROCK (NOTE 3)
- 3.5 FOOT EXCAVATION
- ISS TREATMENT ZONE
- BEDROCK
- PROPERTY LINE
- PDI-33 EL. 12.5 ~2.9' SE — BORING DESIGNATION, GROUND ELEVATION AT BORING LOCATION, DIRECTION FROM STATIONING LINE
- TOP OF BORING
- BOB 44 FT — BOTTOM OF BORING, DEPTH BELOW GROUND SURFACE
- OBSTRUCTIONS OBSERVED IN BORINGS (BASED ON SPT DATA)
- DEBRIS OBSERVED IN BORINGS (BASED ON VISUAL OBSERVATION [NO SPT DATA])

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. DEBRIS AND OBSTRUCTION OBSERVATIONS WERE OBTAINED FROM SOIL BORINGS COLLECTED FROM SITE INVESTIGATION ACTIVITIES REPORTED IN THE REMEDIAL DESIGN REPORT (PARSONS, 2025). THE LOCATIONS AND DEPTHS OF THE OBSERVED DEBRIS AND OBSTRUCTIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. BEDROCK SURFACE AS SHOWN IS INTERPOLATED DUE TO APPROXIMATE OFFSET DISTANCE TO BORING RELATIVE TO THE CROSS SECTION LINE.
4. THE CROSS SECTIONS DETAIL THE NYSDEC APPROVED LIMITS OF ISS TREATMENT BASED ON THE LATERAL AND VERTICAL EXTENT OF NAPL IDENTIFIED DURING SITE INVESTIGATION ACTIVITIES. ADDITIONAL INFORMATION RELATING TO THE SITE INVESTIGATION ACTIVITIES IS PROVIDED IN THE REMEDIAL DESIGN REPORT (PARSONS, 2026).
5. THE CROSS SECTION ALIGNMENTS PRESENTED ARE NOT DRAWN DIRECTLY THROUGH SOIL BORINGS. THE SOIL BORINGS PRESENTED ARE OFF-SET FROM THE ALIGNMENTS IN THE DIRECTION AND AT THE DISTANCE PRESENTED IN THE SOIL BORING TAG MARKERS UNDER THE SURFACE ELEVATIONS. IT IS SUGGESTED THAT THE CONTRACTOR REVIEW THESE CROSS SECTIONS IN CONJUNCTION WITH THE SOIL BORING LOGS PROVIDED IN APPENDIX D OF THE RDR TO BETTER UNDERSTAND THE OBSTRUCTIONS IDENTIFIED DURING THE INVESTIGATION PHASE OF WORK.

10 5 0 10 20
SCALE: 1"=10'

20 10 0 20 40
SCALE: 1"=20'

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-300 - D
DWG. SIZE D | DWG. TYPE COMPANY | SHT. 12
CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	AS SHOWN
DISCIPLINE CODE	SA

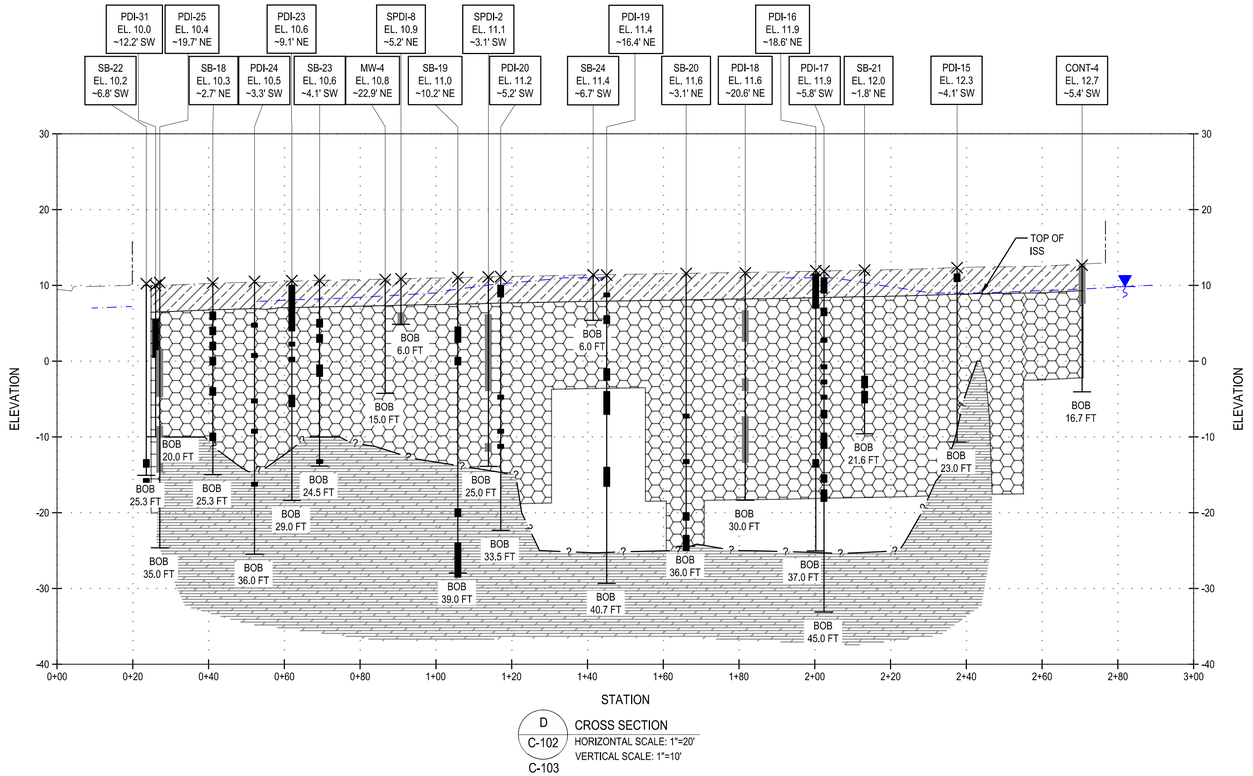
PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
CROSS SECTIONS (SHEET 1 OF 3)

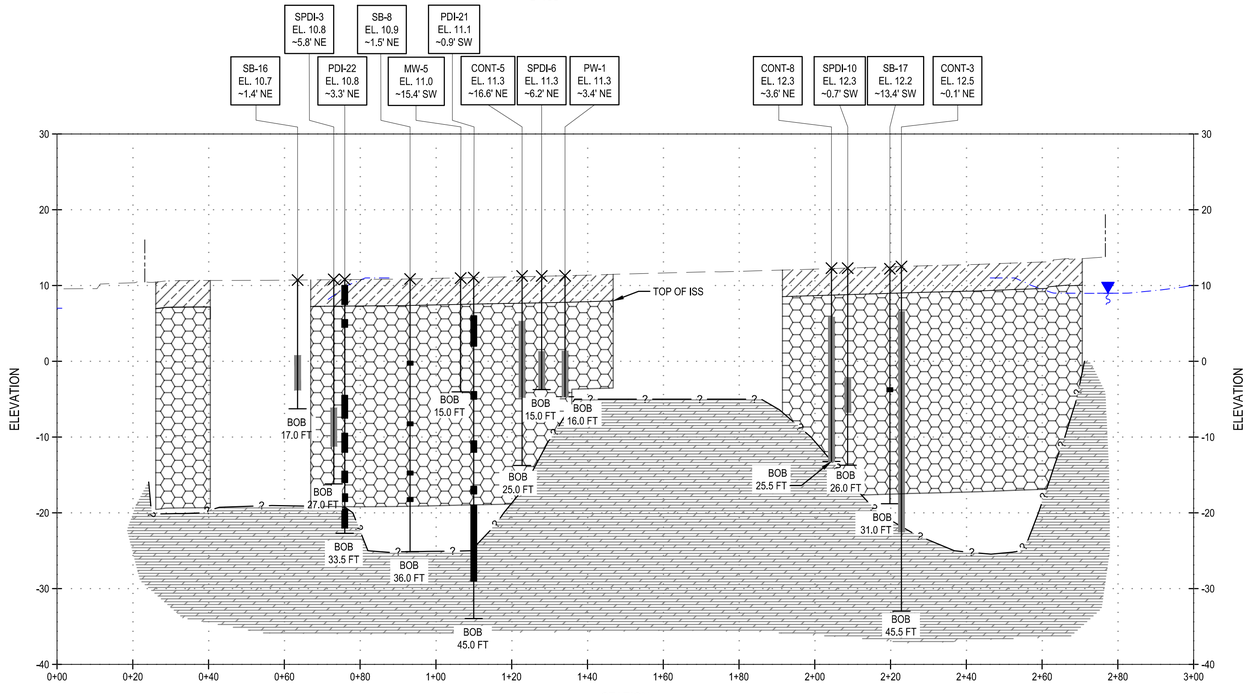
SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-300
SHEET No. 12 OF 17

FILE: \\nysvr04fs01\ P-\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-300 CROSS SECTIONS.DWG, DATE: 03/27/2026 10:09:52AM, p0015477



D
C-102
C-103
CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



E
C-102
C-103
CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'

LEGEND:

- EXISTING GRADE
- GROUNDWATER (MARCH/JULY 2012)
- APPROXIMATE TOP OF BEDROCK (NOTE 3)
- 3.5 FOOT EXCAVATION
- ISS TREATMENT ZONE
- BEDROCK
- PROPERTY LINE
- PDI-33 EL. 12.5 ~2.9' SE — BORING DESIGNATION; GROUND ELEVATION AT BORING LOCATION; DIRECTION FROM STATIONING LINE
- TOP OF BORING
- BOB 44 FT — BOTTOM OF BORING; DEPTH BELOW GROUND SURFACE
- OBSTRUCTIONS OBSERVED IN BORINGS (BASED ON SPT DATA)
- DEBRIS OBSERVED IN BORINGS (BASED ON VISUAL OBSERVATION [NO SPT DATA])

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
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3. BEDROCK SURFACE AS SHOWN IS INTERPOLATED DUE TO APPROXIMATE OFFSET DISTANCE TO BORING RELATIVE TO THE CROSS SECTION LINE.
4. THE CROSS SECTIONS DETAIL THE NYSDEC APPROVED LIMITS OF ISS TREATMENT BASED ON THE LATERAL AND VERTICAL EXTENT OF NAPL IDENTIFIED DURING SITE INVESTIGATION ACTIVITIES. ADDITIONAL INFORMATION RELATING TO THE SITE INVESTIGATION ACTIVITIES IS PROVIDED IN THE REMEDIAL DESIGN REPORT (PARSONS, 2026).
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SCALE: 1"=10'

SCALE: 1"=20'

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-301 - D
DWG. SIZE D | DWG. TYPE COMPANY | SHT. 13

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	AS SHOWN
DISCIPLINE CODE	SA

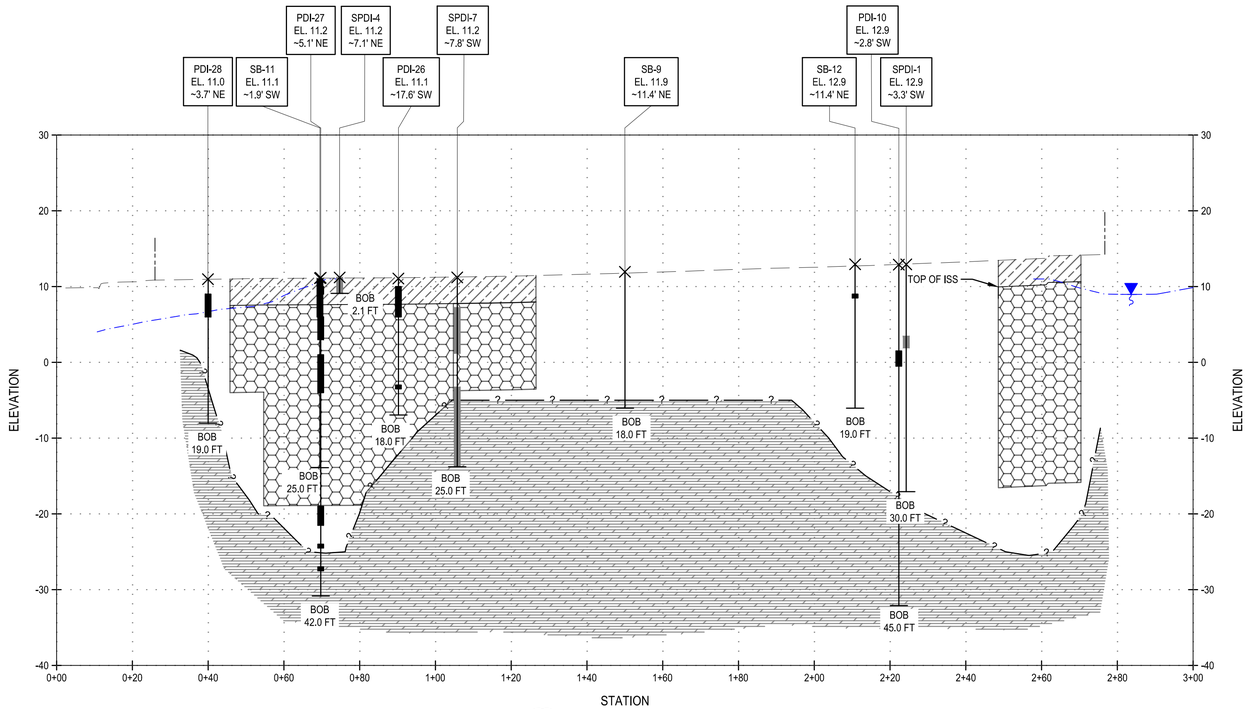
PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
CROSS SECTIONS (SHEET 2 OF 3)

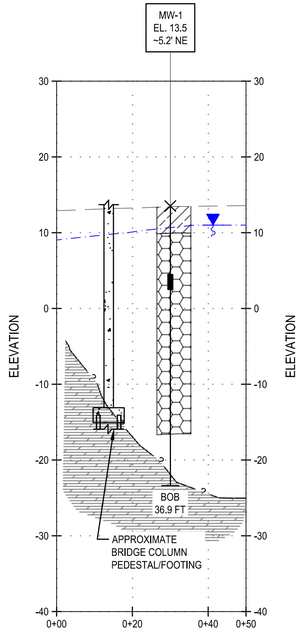
SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-301
SHEET No. 13 OF 17

FILE: I:\nysv\04f491 P:\CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-300 CROSS SECTIONS.DWG, DATE: 03/27/2026 10:10:46AM, p0015477



F / C-102 / C-103 CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



G / C-102 / C-103 CROSS SECTION
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'

LEGEND:

- EXISTING GRADE
- GROUNDWATER (MARCH/JULY 2012)
- APPROXIMATE TOP OF BEDROCK (NOTE 3)
- 3.5 FOOT EXCAVATION
- ISS TREATMENT ZONE
- BEDROCK
- PROPERTY LINE
- PDI-33 / EL. 12.5 / ~2.9' SE — BORING DESIGNATION, GROUND ELEVATION AT BORING LOCATION, DIRECTION FROM STATIONING LINE
- TOP OF BORING
- BOB 44 FT — BOTTOM OF BORING, DEPTH BELOW GROUND SURFACE
- OBSTRUCTIONS OBSERVED IN BORINGS (BASED ON SPT DATA)
- DEBRIS OBSERVED IN BORINGS (BASED ON VISUAL OBSERVATION [NO SPT DATA])

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. DEBRIS AND OBSTRUCTION OBSERVATIONS WERE OBTAINED FROM SOIL BORINGS COLLECTED FROM SITE INVESTIGATION ACTIVITIES REPORTED IN THE REMEDIAL DESIGN REPORT (PARSONS, 2025). THE LOCATIONS AND DEPTHS OF THE OBSERVED DEBRIS AND OBSTRUCTIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. BEDROCK SURFACE AS SHOWN IS INTERPOLATED DUE TO APPROXIMATE OFFSET DISTANCE TO BORING RELATIVE TO THE CROSS SECTION LINE.
4. THE CROSS SECTIONS DETAIL THE NYSDEC APPROVED LIMITS OF ISS TREATMENT BASED ON THE LATERAL AND VERTICAL EXTENT OF NAPL IDENTIFIED DURING SITE INVESTIGATION ACTIVITIES. ADDITIONAL INFORMATION RELATING TO THE SITE INVESTIGATION ACTIVITIES IS PROVIDED IN THE REMEDIAL DESIGN REPORT (PARSONS, 2026).
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10 5 0 10 20
SCALE: 1"=10'

20 10 0 20 40
SCALE: 1"=20'

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-302 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 14

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	AS SHOWN
DISCIPLINE CODE	SA

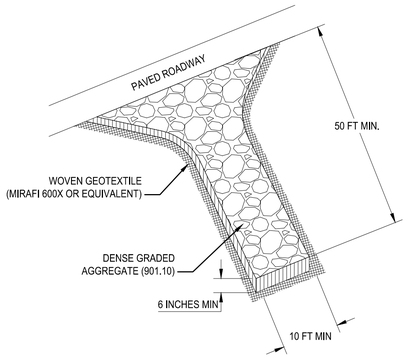
PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
CROSS SECTIONS (SHEET 3 OF 3)

SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-302
SHEET No. 14 OF 17

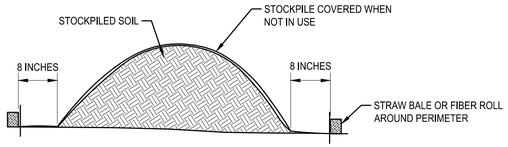
FILE: \\nysvr04fs01\ P-CONED\453607 - WEST 45TH OU-2 RDR\10.0 CAD\CIVIL\453607-C-300 CROSS SECTIONS.DWG, DATE: 03/27/2026 10:11:30AM, p0015477



NOTES:

1. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
2. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
4. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
5. ALL TRUCKS LEAVING SITE SHALL BE WASHED AT THE DECONTAMINATION PAD PRIOR TO EXITING SITE.

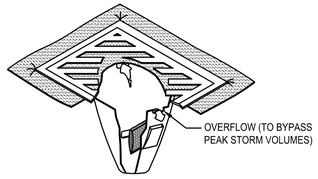
1 C-100 STABILIZED CONSTRUCTION ACCESS
NOT TO SCALE



NOTE:

1. DETAIL APPLIES TO IMPORTED FILL MATERIALS TO BE TEMPORARILY STAGED ON SITE FOR BACKFILL PURPOSES. EXCAVATED MATERIALS SHALL BE STAGED IN AN AREA PER DETAIL 5 PROVIDED ON THIS DRAWING OR AS OTHERWISE SPECIFIED.

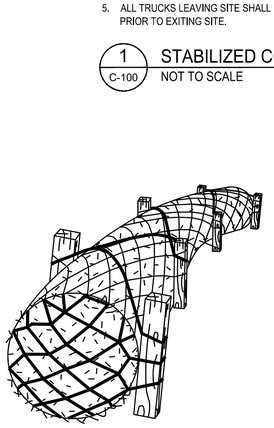
2 – IMPORTED FILL MATERIALS STOCKPILE AREA DETAIL
NOT TO SCALE



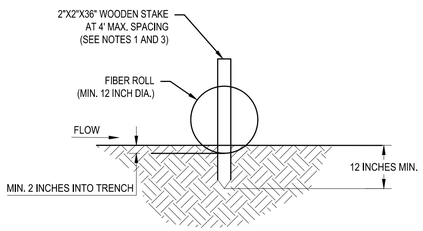
NOTES:

1. DETAIL APPLIES FOR PROTECTION OF EXISTING STORM DRAIN STRUCTURES INCLUDING TRENCH DRAINS.
2. STORM DRAIN INLET PROTECTION SHALL BE REMOVED AT THE COMPLETION OF THE WORK.
3. STORM DRAIN INLETS ARE ONLY TO BE INSTALLED IN DRAINAGE DEVICES PER THE MANUFACTURER'S RECOMMENDATIONS. CATCH BASIN INSERTS ARE NOT TO BE INSTALLED IN CURB INLETS.
4. INSERTS SHALL BE INSPECTED AND MAINTAINED WHEN A 1/2 INCH RAIN ACCUMULATES WITHIN A 24 HOUR PERIOD. CLEAN AND/OR REPLACE INSERT WHEN HALF OF THE TRAP IS FILLED WITH SEDIMENTS.

3 C-100 FILTER FABRIC INLET PROTECTION
NOT TO SCALE



TYPICAL ANCHORAGE OF FIBER ROLL

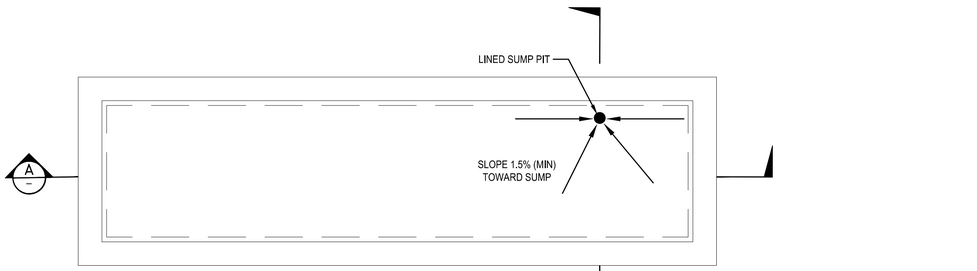


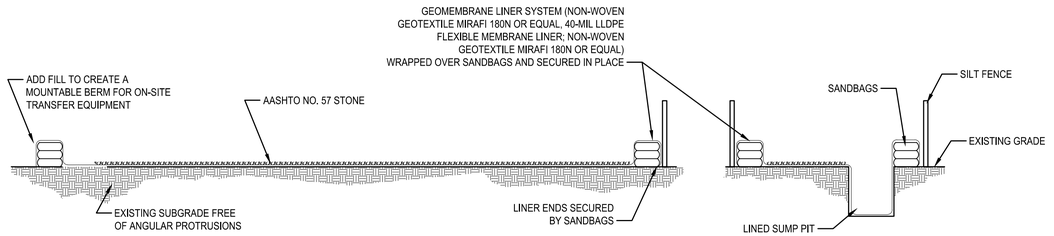
EMBEDMENT DETAIL

NOTES:

1. ALTERNATE TWO (2) 2"X2"X36" WOODEN STAKES ON SIDES OF FIBER ROLL WITH HEMP ROPE HOLDING ROLL DOWN.
2. FIBER ROLL SHALL BE MADE OF COIR (COCONUT FIBER), STRAW OR EXCELSIOR. THE MATERIAL SHALL BE ENCASED IN A NETTING OF JUTE, NYLON, OR BURLAP UNLESS THE MATERIAL HAS INHERENT STRUCTURAL STABILITY.
3. ON PAVED OR COMPACTED GRAVEL SURFACES, THE FIBER ROLL CAN BE PLACED IN INTIMATE CONTACT WITH THE SURFACE WITHOUT TRENCHING. REBAR DRILLED INTO THE PAVEMENT OR SAND/GRAVEL BAGS/TUBES (40 LB. MIN) MAY BE SUBSTITUTED FOR THE WOODEN STAKES.
4. THE FIBER ROLL MAY BE ENCASED IN PLASTIC SHEETING IN LOCATIONS WHERE RUN-OFF IS EXPECTED.
5. FIBER ROLL ENDS SHALL BE BUTTED OR OVERLAPPED TO PREVENT GAPS.

4 C-100 TYPICAL FIBER ROLL DETAIL
NOT TO SCALE





SECTION A

SECTION B

NOTES:

1. DAILY INSPECTION AND MAINTENANCE OF ARE REQUIRED FOR THE DURATION OF THE PROJECT.
2. WHEN ONE-HALF (1/2) FULL, THE STORMWATER COLLECTION SUMP IS TO BE PUMPED OUT. COLLECTED STORMWATER TO BE CONTAINED AND DISPOSED OF AT THE DIRECTION OF THE ENGINEER.
3. SOLIDS ACCUMULATED IN THE SUMP WILL BE EXCAVATED PERIODICALLY AND CONTAINED AND DISPOSED OF AT THE DIRECTION OF THE ENGINEER.
4. WASH/BRUSH STATIONS WILL BE PLACED AT EACH DECONTAMINATION PAD FOR EACH SITE EXIT.

5 – CONTAINMENT PAD FOR EXCAVATED SOIL STOCKPILING, WATER TREATMENT SYSTEM AND DECONTAMINATION PAD
NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.

NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-500 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 15

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	N.T.S.
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
DETAILS (SHEET 1 OF 2)

SEAL & SIGNATURE

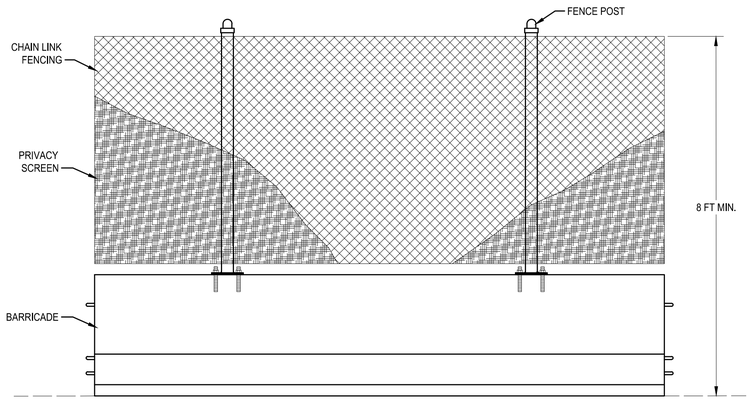
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-500
SHEET No. 15 OF 17

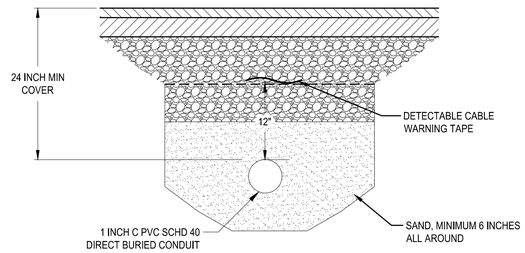
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.

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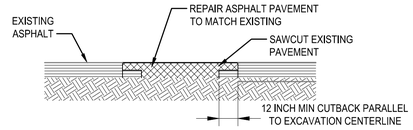
1 / C-101 CONCRETE BARRIER WITH PRIVACY FENCING
NOT TO SCALE



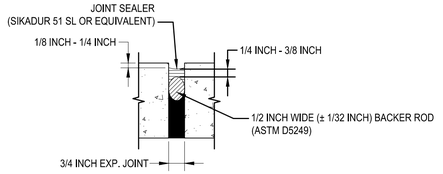
NOTES:

1. DIRECT-BURIED CONDUIT SHALL BE PVC SCHEDULE 40 UL LISTED, OR OTHERWISE INSTALL DIRECT BURIAL CONDUIT IN ACCORDANCE WITH NEC ARTICLE 300, TABLE 300.5 'MINIMUM COVER REQUIREMENTS' TO CONFORM WITH EXISTING COVER.

2 / – DIRECT BURIED CONDUIT (TYP.)
NOT TO SCALE



3 / – PAVEMENT TRANSITION (TYP.)
NOT TO SCALE



4 / - EXPANSION JOINT DETAIL
NOT TO SCALE

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.

NOTES:

1. LAYER THICKNESS IS APPROXIMATE. MATCH EXISTING PAVEMENT SECTION AT TIE-IN POINT.
2. LAYER THCIKNESS TOLERANCE +/- $\frac{1}{2}$ INCH FOR ALL MATERIALS.
3. A MINIMUM OF 31.5 INCHES OF STONE SHALL BE INSTALLED TO MEET THE MINIMUM 3.5 FOOT COVER THICKNESS OVER THE ISS AS APPROVED BY THE NYSDEC. FINAL STONE THICKNESS SHALL BE DEPENDENT ON THE FINAL SURVEY OF THE TOP OF ISS TO MATCH EXISTING GRADE.

5 / C-104 PAVEMENT SECTION RESTORATION (TYP.)
NOT TO SCALE

REVISION
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ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER
453607

DWG. NO. C-501 - D
DWG. SIZE D | DWG. TYPE COMPANY | SHT. 16

CON EDISON | LOCATION MANHATTAN

TITLE
FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE N.T.S.	DISCIPLINE CODE SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
DETAILS (SHEET 2 OF 2)

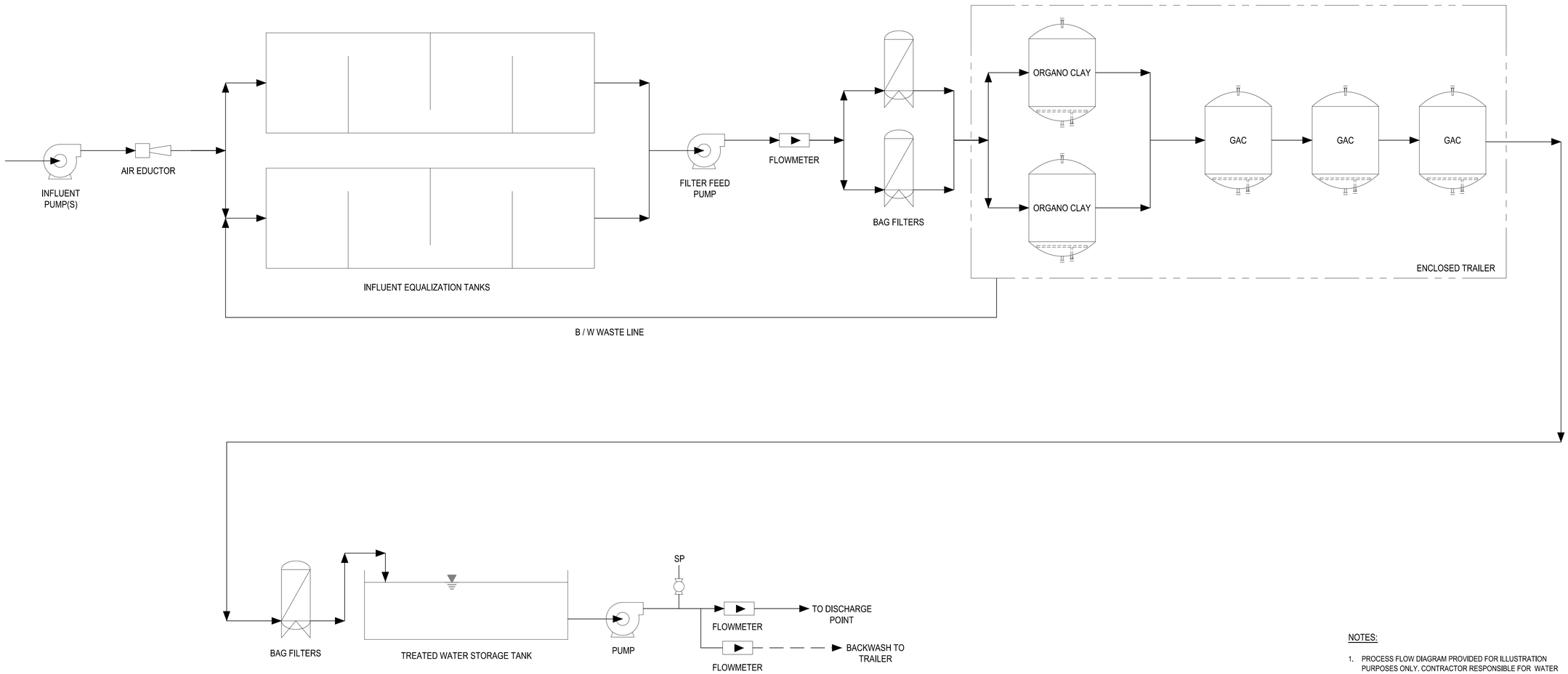
SEAL & SIGNATURE
NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-501
SHEET No. 16 OF 17

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NOTES:

1. PROCESS FLOW DIAGRAM PROVIDED FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR RESPONSIBLE FOR WATER TREATMENT SYSTEM DESIGN, INCLUDING EQUIPMENT SELECTION AND SIZING NECESSARY TO MEET THE PERMITTED DISCHARGE REQUIREMENTS.

REVISION

USE .1 SIZE TEXT ONLY

ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 6/28/2024	A
ISSUED FOR REMEDIAL DESIGN REPORT COMMENTS SUBMISSION P.N. 453607 PARSONS 1/17/2025	B
ISSUED FOR NYSDEC REVIEW P.N. 453607 PARSONS 3/7/2025	C
ISSUED FOR FINAL REMEDIAL DESIGN REPORT P.N. 453607 PARSONS 3/27/2026	D

PROJECT NUMBER

453607

DWG. NO. C-600 - D

DWG. SIZE D | DWG. TYPE COMPANY | SHT. 17

CON EDISON | LOCATION MANHATTAN

TITLE

FORMER WEST 45TH STREET GAS WORKS SITE OPERABLE UNIT 2 REMEDIAL DESIGN

CURRENT ENGINEERING APPROVALS

ENGINEERING MANAGER	K. PARKER
ENGINEER	M. BROSCHART
DESIGNER	J. NASSIMOS
DESIGN CHECKER	D. MARTOCCIA
SCALE	NONE
DISCIPLINE CODE	SA

PROJECT:
FORMER WEST 45TH STREET
GAS WORKS SITE REMEDIAL DESIGN
621 W. 45TH STREET, NEW YORK, NY 10036

TITLE:
PROCESS FLOW DIAGRAM
CONSTRUCTION WATER
TREATMENT SYSTEM

SEAL & SIGNATURE

NOT FOR BIDDING OR CONSTRUCTION

DATE: 3/27/26
PROJECT No.: 453607-01000
DRAWING BY: JN
CHK BY: MBB
DOB DWG No: 453607-C-600
SHEET No. 17 OF 17

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APPENDIX B
TECHNICAL SPECIFICATIONS

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 IDENTIFICATION

The Work shall be performed within Tax Block 1093 Lot 9R, within a parking area associated with the Intrepid Sea, Air, and Space Museum in Manhattan, New York (the Site) bounded by roadways: West 45th Street, West 46th Street and the Hudson River Greenway (aka, Route 9A) and by commercial properties to the east.

1.2 SUMMARY OF WORK

A. This section is intended to provide a summary of the various elements of work related to the implementation of the NYSDEC selected remedy for the OU-2 portion of the Former West 45th St. MGP Site. This section does not provide the technical detail of the referenced sections for work activities, but describes the general work, providing an overall perspective to the separate tasks and their interrelationships. This summary should be read in conjunction with Con Edison's supplemental contract requirements, the Technical Specifications, the Construction Drawings, the Remedial Design Report, and all other sections to establish the total requirements of the work.

B. The NYSDEC-selected remedy for OU-2, as presented in the NYSDEC Decision Document (July 27, 2021), consists of the removal and disposal of surface material and subgrade soils, In-Situ Stabilization and Solidification (ISS) of soils that exceed Commercial Use Soil Cleanup Objectives (SCOs) and/or NAPL-impacted soils from 5 feet to 30 feet bgs or bedrock, installation of a site cover system, and establishment of institutional controls (ICs) and engineering controls (ECs) for remaining Site contamination.

C. Perform all Work in accordance with the Contract Documents, the New York State Department of Environmental Conservation (NYSDEC) approved Remedial Design Report, and with all applicable federal, state, and local regulations and guidance documents.

D. The overall scope of work is divided into several activities as outlined below. The referenced sections for each work category represent the primary construction elements only.

1. Pre-mobilization
    a. Contractor plan submittals and approved Project Plans
2. Site Preparation
    a. Mobilization
    b. Surveys and Pre-Construction Surveys
    c. Temporary site facilities and controls including dust and odor control measures
3. Site Demolition
    a. Selective demolition (above-grade)
    b. Demolition of subsurface structures within work area(s)

4. Excavation
    a. Excavation, segregation, waste characterization and disposal of excavated material
5. In Situ Stabilization/Solidification
    a. Dewatering (as required)
    b. Debris/obstruction management
    c. Supplying and metering of reagents and water
    d. Mixing of reagent with impacted soils and swell management
    e. Layout, sequencing, and overlapping of ISS areas
    f. Curing
    g. Quality control including sample collection, testing, and coring (as required)
6. Decontamination and management of decontamination fluids
7. Restoration
    a. Backfilling and restoration of surfaces within the work area(s)
    b. Restoration of site utilities (as required)
    c. Restoration of site services (as required)
    d. Site restoration and repairs (as required)
8. Final Survey and as-built documentation
9. Demobilization

C. Unless otherwise specified, all scope of work and/or responsibilities within the Technical Specifications and Construction Drawings are the responsibility of the Contractor. Responsibilities of the Owner and the Engineer are specifically noted. If the Technical Specifications are unclear or responsibilities are assigned to the wrong party, seek clarification from the Engineer during the bid process.

1.2 CONTRACTOR MEANS AND METHODS AND SUBMITTALS

A. Means and Methods: The Contractor shall determine the means and methods for executing the remedy at the Site while achieving the established remedial goals and remedial action objectives as approved by Owner and the Engineer. In general, the Contractor shall propose its means and methods to Owner and Engineer via submittals that will be reviewed by Owner and/or Engineer for compliance with the Contract Documents.

B. Contractor Submittals: The required submittals include but are not limited to the following:

1. Project Schedule
2. Schedule of Values and Cash Flow Diagram
3. Site-Specific Health and Safety Plan (SSHASP)
4. Pre-Construction Surveys
5. Contractor Construction Plan
6. Traffic Control Plan

7. Field Office Submittal
8. Pre-construction Condition Surveys and Structural Monitoring Submittals
9. Comprehensive Submittal Schedule
10. Construction Work Plan
11. ISS Work Plan
12. Contractor's Quality Control Plan (CQCP)
13. Name, Address, and Qualifications of Independent Testing Laboratory, (ITL) and/or alternate sampling and testing staff
14. Borrow Source Information

1.3 DEFINITIONS

A. Contract - The contract between Owner and Contractor consisting of: (a) the Owner purchase order; (b) the relevant Owner invitation for bids or request for proposals including answers and clarifications to bidder questions and requests; (c) Con Edison Standard Terms and Conditions; and (d) any and all plans, schedules, specifications, addenda drawings, and other documents, to the extent that they are directly or indirectly incorporated by reference in (a), (b) and (c) above. The words "hereof," "herein," "hereto" and "hereunder" as used in these Standard Terms and Conditions all refer to the Contract.

B. Contract Documents - All documents which, when combined, form the basis of the Contract. Includes, but is not limited to: Executed agreements, supplementary conditions, Construction Drawings, Technical Specifications, Con Edison standard specifications, and the Remedial Design Report, NYSDEC Decision Document.

C. Contractor - The individual or entity with whom the Owner has entered into an agreement for performance of the Work

D. Construction Drawings - Engineering drawings depicting the Work that are issued for construction

E. Engineer - Parsons Environment & Infrastructure Group Inc.

F. Hazardous Waste - The term hazardous waste shall have the meaning provided in section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended and as defined in the New York State Department of Environmental Conservation (NYSDEC), Hazardous Waste Management Regulations

G. Owner - Consolidated Edison Company of New York, Inc. (Con Edison), Owner of the project

H. Site - Lands or areas indicated in the Contract Documents as being furnished by the Owner upon which Work is to be performed, and such other lands furnished by the Owner which are designated for the use of the Contractor

I. Subcontractor - Any company or person, other than an employee of the Contractor that furnishes any of the Work on behalf of the Contractor

J. Technical Specifications - The sections provided herein, as well as Con Edison standard specifications which make up a portion of the Contract Documents.

K. Work - The remediation project executed by the Contract and all labor and supervision; materials, equipment, and tools; and other things of any nature necessary or proper for the completion of the project, whether or not expressly specified herein.

1.4 FEDERAL, STATE, AND CITY CODES, STANDARDS, AND REGULATIONS

A. Refer to Technical Specifications and Con Edison Standard Specifications for applicable federal, state, and New York City codes, regulations, and standards.

1. Building Code, City of New York, current version
2. New York City, Department of Buildings (NYCDOB)
3. New York City Department of Transportation (NYCDOT)
4. New York State Department of Environmental Conservation (NYSDEC)
5. New York State Department of Transportation (NYSDOT)
6. New York City Plumbing Code
7. United States Environmental Protection Agency (USEPA)

1.5 EXECUTION

B. Contractor

1. The Contractor is advised that the Work is performed on a site that may contain hazardous waste. The Contractor is responsible for developing and implementing a site-specific CHASP for its operations. Implement this plan taking precautions as necessary to protect the public and work force personnel from potential hazards. Utilize personnel with approved hazardous waste training as specified in Specification Section 01100 – Health and Safety Requirements.
2. The Contractor shall coordinate all Work with Owner and Engineer.
3. Utilize every precaution to protect the property, utility lines, trees, walls, and other above ground or underground structures and/or utilities from damage on site and on adjacent property on the east side and adjacent roadways. Repair or replace any damage inflicted in a prompt manner as directed by the property owner at no additional cost to the property owner or Owner.
4. Take all measures required to minimize adverse impacts from execution of the Work. Coordinate road closures and vehicular and pedestrian traffic control plans, as necessary, with property owner, Owner, and other applicable local authorities, as required. Implement traffic and pedestrian traffic control in accordance with the requirements of the local authorities and Owner.

C. Contractor's Use of Premises

1. Contractor storage areas located outside of the proposed work areas must be agreed upon by the Owner. All storage and lay down areas are to be agreed upon and accepted by the Owner.
2. Be responsible for the protection and safe keeping of products, equipment, materials, etc., under this Contract that are stored during construction activities.

D. Other Requirements of the Contractor

1. Notify owners and operators of underground utilities when construction, excavation, or other work may affect such utilities.
2. Comply with the requirements of the Contract Documents and use special care and/or special considerations that may be necessary for proper execution of the Work, but which may not be specifically identified in this section.

3. Obtain known utility information from NYCDOB and Owner.

4. Comply with all the requirements of all permits that have been obtained, or applied for, by the Owner and Engineer.

E. Compensation

1. Compensation for the execution of the intended Work as defined by the Contract Documents is specified in Specification Section 01025 – Measurement and Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

*** END OF SECTION 01010 **

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers the methods and procedures that will be used to measure the Contractor's work and to provide payment. This general outline of the measurement and payment features will not limit the responsibility of the Contractor for making a thorough review of the Contract Documents and Site to determine the scope of the work included in each bid task.

B. Payment will be made to the Contractor in accordance with the specified methods of measurement and the unit or lump sum prices stipulated in the accepted bid. Payment will constitute complete compensation for all work required by the Contract Documents including all costs of accepting the general risks, liabilities and obligations, expressed or implied. Payment under all tasks will include, but not necessarily be limited to, compensation for furnishing all supervision, labor, equipment, material, and services; for obtaining required permits and performing all other related work required; and for overhead, profit, and applicable taxes. No other payment will be made.

C. No payment shall be made for work performed by the Contractor to replace defective work, work which is not required by the Contract Documents, work outside the limits of the Contract or for any additional work necessary due to actions of the Contractor, unless ordered by the Engineer in writing.

1.2 INCIDENTAL ITEMS

A. Except for the items designated hereunder for measurement and payment, the costs of items necessary to complete the work as specified are considered incidental to the items specified for measurement and payment. The costs of incidental items shall be included in the prices of items specified for measurement and payment.

1.3 QUANTITIES

A. The quantities indicated in the Bid Form are the quantities estimated for the evaluation of bids. The actual quantities of items to be paid on a unit price basis may vary from the quantities indicated in the Bid Form.

1.4 RELATED PROVISIONS SPECIFIED ELSEWHERE

A. Payment to Contractor: Refer to Contract Terms and Conditions and Owner Construction Contract Management Procedures.

B. Changes in Contract Price: Refer to Bid Form, Owner Construction Contract Management Procedures and Contract Terms and Conditions. The estimated quantities of unit price

work are not guaranteed and are solely for the purpose of comparing bids and determining the initial contract price.

1.5 MEASUREMENT AND PAYMENT SUBMITTALS

A. Schedule of Values: Submit two copies of the Schedule of Values to Owner and the Engineer for approval 14-days after Notice of Award. Revise and resubmit the Schedule of Values as required. The Schedule of Values shall show a breakdown of labor, materials, equipment and other costs for each bid item, when appropriate. When requested by Owner or the Engineer, support values with data that will substantiate the submitted costs.

B. Cash Flow Diagram: Submit a Cash Flow Diagram 14-days after Notice of Award showing the anticipated monthly expenditures for the project. The Cash Flow Diagram shall be based on the Schedule of Values and the Progress Schedule as per Specification Section 01310 – Progress Schedules.

PART 2 - MEASUREMENT

2.1 TOTAL JOB BASIS

A. Measurement of all lump sum items will be on a total job basis.

2.2 VOLUME BASIS

A. Where items are specified to be measured on a volume basis, the volume will be determined on an in-place basis (prior to excavation or after placement and compaction of materials/ imported fill) between the existing and final ground surfaces or grade lines shown on the Construction Drawings.

B. Over-excavation, defined as excavation beyond the specified or approved limits indicated on the Construction Drawings, will not be measured for payment.

C. The volume of soil treated via in-situ stabilization/solidification (ISS), not including column overlap, will be determined by comparing the pre-ISS ground elevation (i.e., ground elevation after removal of top 5 feet of existing materials) and the bottom elevation of each ISS column.

D. The volume of soil treated via ISS beyond the specified or approved areas will not be measured for payment.

2.3 WEIGHT BASIS

A. Where items are specified to be measured on a weight basis, the weight will be determined by the sum of printed certified truck scale tickets or automated certified mixing plant scales. Scale tickets must be cross-referenced with the number of trucks and must be signed by the Owner or the Engineer once per day.

B. Lost scale tickets may be replaced by the vendor invoice only upon approval by the Owner or the Engineer.

2.4 AREA BASIS

A. Where items are specified to be measured on an area basis, the area will be determined by a field survey of the quantity installed that are certified by a Professional Land Surveyor licensed and registered in the State of New York. The area will be calculated on a plan view with no adjustment for grade changes or slopes.

B. Quantities installed beyond the specified or approved limits will not be measured for payment.

C. No adjustments will be made for the required overlap of materials.

2.5 LENGTH BASIS

A. Where items are specified to be measured on a length basis, the length will be determined by a field survey of the length installed (measured along the centerline) that are certified by a Professional Land Surveyor licensed and registered in the State of New York. The length will be calculated on a plan view with no adjustment for grade changes or slopes.

B. Quantities installed beyond the specified or approved limits will not be measured for payment.

C. No adjustments will be made for the required overlap of materials.

2.6 UNIT BASIS

A. Where items are specified to be measured on a unit basis, excluding unit price items measured on a volume, area or length basis, measurement will be of each unit as specified.

PART 3 – BID ITEMS

3.1 ITEM 1 – MOBILIZATION/SITE PREPARATION

A. Work Included: Furnish and install all materials, equipment, and labor for all work specified in the Contract Documents that is not included in other bid items, inclusive, but not limited to: Project Plans (e.g., statement of methods, Construction Work Plan, Construction Water Management Plan, and CHASP); office furniture and supplies; temporary utilities; pre-and post-construction condition surveys; structural instrumentation and monitoring; soil erosion and sediment control measures; staging areas; removal and disposal of existing fencing, signs, and landscaping; temporary fencing; permits; collection and disposal of miscellaneous wastes; decontamination services and temporary decontamination pad; health and safety items (including but not limited to related monitoring, analysis, clothing, equipment, PPE disposal, facilities, required personnel, medical surveillance program including physical examinations); New York 811 utility mark out (Code 753); preliminary testing of materials; project photographs; all project records and documents; and mobilization of construction crews and equipment.

B. Measurement: Lump Sum payments for each mobilization item based on the approved Schedule of Values.

C. Payment: Payment shall be made on a progress basis, based on the percentage of mobilization completed, in accordance with the approved Schedule of Values. No payment shall be made until:

1. The Contractor has physically occupied the site;
2. Temporary facilities are operational;
3. Submittals have been approved by the Engineer; and
4. Sufficient equipment is available to start work.

3.2 ITEM 2 – CONTRACTOR SITE MANAGEMENT

A. Work Included: All Contractor on- and off-site management employees required to perform the contract work including, but not limited to, executives, attorneys, project managers, superintendents, project engineers, estimators, purchasing agents, schedulers, health and safety personnel, accounting staff, clerks, and receptionists.

B. Measurement: Lump Sum.

C. Payment: On a percent complete basis.

3.3 ITEM 3 – UTILITY REMOVAL/REPLACEMENT

A. Work Included: All costs related to utility removal, temporary by-pass, temporary relocation and permanent replacement as shown on the Construction Drawings including water, sewer, gas, electric, telecommunication, and roof drains.

B. Measurement: Lump Sum.

C. Payment: On a percent complete basis.

3.4 ITEM 4 – GROUND WATER MONITORING WELL DECOMMISSIONING AND ABANDONMENT

A. Work Included: All costs related to decommissioning and abandoning of monitoring wells as indicated on the Construction Drawings and in accordance with Specification Section 33011 – GW Monitoring Well Abandonment.

B. Measurement: Length of well casing as measured prior to decommissioning and abandonment.

C. Payment: Unit price per foot.

3.5 ITEM 5 – DEMOLITION – CONCRETE STRUCTURES

A. Work Included: All costs related to the demolition of concrete structures and buildings as shown on the Construction Drawings and detailed on the as-built drawings provided with the bid documents, in accordance with Specification Section 01732 – Selective Demolition.

B. Measurement: Lump Sum.

C. Payment: On a percent complete basis

3.6 ITEM 6 – SURVEYS

A. Work Included: All costs related to surveying in accordance with Specification Section 01050 – Surveys.

B. Measurement: Lump Sum.

C. Payment: On a percent complete basis

3.7 ITEM 7 – ISS TREATMENT

A. Work Included: All costs related to ISS in accordance with Specification Sections 02160 – ISS – Using Auger Mixing, 02161 – ISS Using Bucket Mixing, and 02162 – ISS Using Jet Grouting.

B. Measurement: In-place volume of soil treated via ISS, not including column overlap, as determined by comparing the pre-ISS ground elevation (i.e., ground elevation after removal of top 5 feet of existing materials) and the bottom elevation of each ISS column within the limits specified in the Contract Documents. This payment includes management of ISS swell material.

C. Payment: Unit price per in-place cubic yard separately for Auger Mixing ISS, Bucket Mixing ISS and Jet Grouting ISS.

3.8 ITEM 8 – EXCAVATION OF OVERBURDEN SOILS

A. Work Included: All costs related to the excavation and management of overburden soil in accordance with Specification Section 02315 – Excavation.

B. Measurement: The quantity shall be based on the weight of disposed materials as measured at the disposal facility scale as per Bid Items 11A and 11B.

C. Payment: Unit price per ton.

3.9 ITEM 9 – EXCAVATION SHORING AND PROTECTION

A. Work Included: Providing all labor, materials, equipment, and incidentals required for the shoring and protection of on-site and off-site features, including but not limited to installation, maintenance and removal of bracing, shoring, sheet piles, tiebacks, etc.; sloping of excavation sidewalls; the removal of surface and subsurface obstructions (not already removed as part of Bid Item 6) that may impede the installation of this shoring system, and de-tensioning of tiebacks.

B. Measurement: Unit per square foot.

C. Payment: Unit price per square foot.

3.10 ITEM 10A – DISPOSAL – HAZARDOUS

A. Work Included: Loading, transportation, and disposal of excavated hazardous soil and debris to an Owner-approved off-site disposal facility in accordance with Specification

Section 02120 – Off-Site Transport and Disposal.

B. Measurement: The quantity shall be based on the weight of disposed materials as measured at the disposal facility scale.

C. Payment: Unit price per ton.

3.11 ITEM 10B – DISPOSAL – NON-HAZARDOUS

A. Work Included: Loading, transportation and disposal of excavated non-hazardous soil and debris, including all ISS spoils, to an Owner-approved off-site disposal facility in accordance with Specification Section 02120 – Off-Site Transport and Disposal.

B. Measurement: The quantity shall be based on the weight of disposed materials as measured at the disposal facility scale.

C. Payment: Unit price per ton.

3.12 ITEM 10C – DISPOSAL – CONCRETE / DEBRIS

A. Work Included: Loading, transportation, and disposal of demolished concrete and other debris to an Owner-approved off-site disposal facility in accordance with Specification Section 02120 – Off-Site Transport and Disposal.

B. Measurement: The quantity shall be based on the weight of disposed materials as measured at the disposal facility scale.

C. Payment: Unit price per ton

3.13 ITEM 10D – DISPOSAL – ASBESTOS-CONTAINING MATERIAL

A. Work Included: Loading, transportation and disposal of asbestos-containing material (ACM) generated as part of the demolition to a Owner-approved off-site disposal facility as per Specification Section 02120 – Off-Site Transport and Disposal.

B. Measurement: The quantity shall be based on the weight of disposed materials as measured at the disposal facility scale.

C. Payment: Unit price per ton.

3.14 ITEM 11 – CONSTRUCTION WATER MANAGEMENT

A. Work Included: All costs related to construction water management in accordance with Specification Section 02145 – Water Treatment and Disposal.

B. Measurement: Lump sum.

C. Payment: On a percent complete basis.

3.15 ITEM 12 – DUST, VAPOR, AND ODOR CONTROL

A. Work Included: Provide dust, vapor, and odor control measures in accordance with Specification Section 01110 – Environmental Protection Procedures.

B. Measurement: Lump Sum.

C. Payment: On a percent complete basis.

3.16 ITEM 13 – SITE RESTORATION

A. Work Included: Furnish and install all restoration items shown on the Construction Drawings and in accordance with Specification Section 01780 – Demobilization and Site Restoration, including drainage system; stone subbase; curbing; asphalt paving; asphalt striping; site lighting; chain link fencing; and landscaping.

B. Measurement: Lump Sum

C. Payment: On a percent complete basis.

3.17 ITEM 14 – BACKFILL

A. Work Included: Furnish and install backfill in accordance with Specification Section 02310 – Rough Grading and Backfill.

B. Measurement: The quantity shall be based on the weight of backfill as measured by truck delivery tickets.

C. Payment: Unit Price per ton.

3.18 ITEM 15 – DEMOBILIZATION

A. Work Included: Furnish all materials, equipment and labor to demobilize and remove from the site in accordance with Specification Section 01780 – Demobilization and Site Restoration, including, but not limited to all equipment, unused supplies; temporary facilities; office furniture and supplies; temporary utilities; staging areas; health and safety facilities; temporary fencing; PPE disposal; waste disposal; decontamination pads and equipment; and submission of all project closeout documents.

B. Measurement. Lump sum.

C. Payment: On a percent complete basis.

*** END OF SECTION 01025 ***

SECTION 01050

SURVEYING

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes, but is not limited to the following:

1. Provide all materials, items, operations, or methods specified, listed, or scheduled on the Construction Drawings, Technical Specifications, or Project Plans including all materials, supervision, labor, equipment, and incidentals necessary and required to conduct proper surveys required to stake and layout the work.
2. Perform surveys, layouts, and related work under the supervision of and certified by a Professional Land Surveyor (PLS) licensed and registered in the State of New York.
3. Be solely responsible for all locations, dimensions, and other levels. No data other than written directions from the Owner shall justify departure from the dimensions and levels required by the Contract Documents.
4. Provide such facilities and assistance as necessary for the Engineer to check line and grade points.
5. Maintain a transit and leveling instrument on site at all times and a skilled instrument operator available when necessary for the layout of the work.

1.2 SUBMITTALS

A. Submit to Engineer, for review and acceptance, the name, address, telephone number, and New York registration number of the PLS before starting work.

B. Submit surveys in accordance with the requirements of Specification Section 01783 – Project Record Documents and this Section. Surveys to include:

1. Pre-Construction Survey, depicting the pre-construction horizontal and vertical limits for the site, including the subareas, utilities, and structures (on Site and adjacent) as shown on the Construction Drawings, including spot elevations and topographic contours.
2. Interim Survey(s), depicting the installation of any support components, including alignment and spot elevations.
3. Post-Excavation Survey, depicting the horizontal and vertical limits of material removal from the site including spot elevations and topographic contours.
4. ISS Survey, depicting the horizontal and vertical limits of the ISS activities completed.
5. Final As-Built Survey, depicting the final grades and surface conditions for the site, including the subareas, as shown on the Construction Drawings, including spot elevations and topographic contours.

C. Immediately bring to the attention of the Owner and the Engineer any discrepancies found between the Construction Drawings and the pre- or post-construction surveys.

D. Submit an updated monthly site plan that includes as-built excavation and grading details and calculations prepared by the PLS.

E. Submit all as-built drawings (hardcopies and AutoCAD files in '.dwg' format using AutoCAD 2013 or later for all the surveys noted above) to the Owner and the Engineer at the conclusion of Work.

1.3 REQUIREMENTS

A. Provide all materials as required to properly perform the surveys, including, but not limited to, instruments, tapes, rods, measures, mounts and tripods, stakes and hubs, nails, ribbons, other reference markers, and all else as required. Use material of good professional quality and in first-class condition.

B. Calibrate and maintain lasers, transits, and other instruments in accurate calibration throughout the execution of the work. Make available calibration certificates for Owner or Engineer review upon request.

C. Conduct surveying in accordance with Owner requirements and the following requirements, whichever is more stringent.

1. The precision of horizontal and vertical controls shall meet or exceed Third-Order Class I and Third-Order accuracies, respectively, as defined by the National Geodetic Survey Standards.
2. Surveys shall be contoured in 1.0-foot intervals.
3. The monthly site plan with as-built excavation and ISS details shall have a maximum grid of 25 feet.
4. Conformance check surveys for elevation shall be ±0.1 feet and for horizontal, control angles shall be to the nearest twenty (20) seconds ±10 seconds and measured distances shall be to ±0.1 feet.
5. All measurement surveys for elevation shall be to the nearest 0.1 feet ±0.05 feet and for horizontal distances shall be to ±0.1 feet.
6. Surveys shall be performed in the North American Vertical Datum 1988 (NAVD88) vertical datum and in North American Datum 1983 (NAD83) New York State Plane (Long Island Zone) horizontal datum.

D. General Requirements for all Survey Deliverables:

1. Submit surface digital terrain models (DTM) compatible with AutoCAD/Civil 3D for each topographic survey.
2. Submit AutoCAD files in version 2018, AutoCAD Civil 3D version 2018 dwg, and portable document format (.pdf).
3. Submit survey point files in .csv, .xyz, and/or .txt format, as requested by Engineer.

4. Submit survey surface files in .xml format.
5. Submit an unsigned and unsealed draft .pdf and .dwg for review and approval.
6. Submit a final signed and sealed .pdf, .dwg, and D-size hardcopy upon the approval of the draft submission by the Engineer.
7. Smallest scale of submitted survey plans shall be 1" = 40'.
8. Show locations of found survey control points.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 SURVEY REFERENCE POINTS

A. Reference survey and site reference points to the existing survey control points and record locations of survey control points, with horizontal and vertical data, are indicated on Contract Documents.

B. Protect survey control points prior to starting site work and preserve permanent reference points during construction. Do not relocate site reference points without prior written acceptance from the Engineer.

C. Promptly report to the Engineer the loss, damage, or destruction of any reference point or relocation required for any reason. Replace dislocated survey control points based on original survey control at no additional cost to the Owner. Perform replacement of dislocated survey control points previously accepted by the PLS.

3.2 SURVEY REQUIREMENTS

A. Establish lines and levels, locate and layout by instrumentation and similar appropriate means:

1. Site features to be constructed including necessary stakes for cut, fill, placement, and grading operations and stakes for utility locations, slopes, and invert elevations.
2. When necessary to remove a grade marker for construction operations, maintain the grade lines parallel and extending at least one (1) grade marker adjacent on each side.

B. Preserve all marks provided and, if destroyed or removed without Owner's acceptance, reset at the Contractor's expense.

C. The cost of all work and delays caused by providing of lines and grades, or making other necessary measurements, will be considered as having been included in the unit and lump sum prices for items of work.

D. Remove and replace all work not performed with the methods and equipment as approved by the Engineer at no cost to the Owner, unless instructed otherwise by the Engineer.

E. Keep the Owner and Engineer informed of the intended times and places for work in order that they may have ample opportunity to furnish and/or verify the lines and elevations with a minimum of inconvenience or delay.

3.3 SURVEYS FOR MEASUREMENT AND PAYMENT

A. Perform certified surveys, in a manner acceptable to the Engineer, to determine quantities of unit cost work and percent of completed lump sum work including surveys to establish measurement reference lines.

B. At the completion of the work, prepare a final Certificate of Cost based upon the surveyed as-built drawings and reconcile with the Owner any quantity discrepancies for unit cost work. The Final Payment will provide any adjustment that may be necessary.

C. Provide as-built drawings showing the final surveyed locations of all newly installed site features (including drainage components, concrete, asphalt pavement, curbing, paint markings, etc.). Provide additional drawings with utility locations and site features as required in the Construction Drawings.

*** END OF SECTION 01050 ***

SECTION 01100

HEALTH AND SAFETY PLAN REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Scope:

1. Prepare and maintain a written, Site-specific, health and safety plan (SSHASP), and conduct construction activities in a safe manner that avoids:

   a. Injuries to employees, Subcontractors, and other persons with an interest at or near the Site;

   b. Exposure of the public to air contaminants above levels established for public exposure by the U.S. Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), and by other authorities having jurisdiction at the Site;

   c. Significant increases in concentrations of contaminants in soil, water, or sediment near the Site; or

   d. Violations of OSHA Regulations, or other Laws or Regulations.

2. The Contractor shall be solely responsible and liable for the health and safety of onsite personnel and off-site communities potentially impacted by the remediation.

3. This section describes the minimum health and safety requirements for this project including the requirements for the development of a written SSHASP. Onsite workers shall comply with the requirements of the SSHASP. The Contractor's SSHASP must comply with applicable federal, state, and local regulations protecting human health and the environment from the hazards posed by activities during this Site remediation. The SSHASP is a required deliverable for this project. The SSHASP will be reviewed by Con Edison EH&S Safety representatives for acceptability. Resubmit the SSHASP, addressing review comments. Onsite work in contaminated areas shall not initiate until an acceptable SSHASP addressing comments has been developed.

4. Consistent disregard for the provision of the health and safety specifications herein shall be deemed just and sufficient cause for immediate stoppage of work and/or termination of the Contract or Subcontract without compromise or prejudice to the rights of the Owner or the Engineer.

5. The safety and health of the public and project personnel and the protection of the environment will take precedence over cost and schedule considerations for project work. Additional costs will be considered only after the cause for suspension of operations is addressed and work is resumed. The Owner and Engineer's on-site representatives and the Contractor's Superintendent will be kept apprised, by the Safety Officer (SO), of conditions which may adversely affect the safety and health of project personnel and the community. The Owner may stop work for health and safety reasons. If work is suspended for health and/or safety reasons, it shall not resume until approval is obtained from the Owner. The

cost of work stoppage due to health and safety is the responsibility of the Contractor under this Contract.

6. Comply with applicable laws, ordinances, rules, regulations, and orders for public bodies having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss, including, without limitation, the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Administration (OSHA) of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54) and amendments thereto. The Contractor shall comply with the requirements set forth under 29 CFR 1910 and 29 CFR 1926. The Contractor shall comply with applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America.

   In addition, the Contractor is to comply with Owner's Corporate Environmental, Health and Safety Procedures (CEHSP) such as A32.00 – Rules We Live By (Revised March 30, 2022: Effective May 4, 2022 and STKY (Stuff That Kills You) and the Energy Wheel for Hazard Identification and Mitigation

1.02 QUALITY ASSURANCE

A. Qualifications:

1. Preparer of SSHASP:

   a. Engage a Certified Industrial Hygienist (CIH), accredited by the American Board of Industrial Hygiene, or Certified Safety Professional certified by the Board of Certified Safety Professionals, to prepare or supervise preparation of SSHASP. The CIH must have a minimum of two years of experience in hazardous waste site remediations or related industries and have a working knowledge of federal and state occupational health and safety regulations.

   b. SSHASP preparer shall be thoroughly familiar with: (i) laws and regulations and industry standards of safety and protection relating to health and safety pertaining to the Work; (ii) the requirements of the Contract Documents relative to health, safety, and protection; (iii) health and safety hazards associated with the Work and appropriate protections therefore; and (iv) the Engineer's and Owner's safety programs.

   c. Submit preparer's qualifications with SSHASP.

2. Fulltime Dedicated Safety Officer:

   a. Engage a CSP, a safety professional certified by the Board of Certified Safety Professionals, to manage, oversee, and enforce the Contractor's health and safety program at the Site, and ensure compliance with the Contractor's SSHASP and applicable laws and regulations during the Project. The designated SO must have at a minimum, five years of experience in the remediation of hazardous waste sites or related field experience. The SO must have formal training in health and safety and be conversant with federal and state regulations governing occupational health and safety. The SO must be certified in CPR and first aid and have experience and training in the implementation of personal protection and air monitoring programs. The SO must have "hands-on" experience with the operation and maintenance of real-time air monitoring equipment.

b. The Contractor's dedicated safety representative shall be present at the Site at all times when Work is being performed and shall be dedicated solely to the supervision of the Contractor's health and safety program.

c. Responsibilities include, but are not necessarily limited to, the following:

1) Supervising the implementation of the Contractor's SSHASP.

2) Providing health and safety orientation training to the Contractor's employees, Subcontractors, and Site visitors.

3) Attending pre-construction conference, progress meetings, and other Project meetings, as required.

4) Preparing and maintaining health and safety records and statistics.

5) Leading and documenting daily job safety briefings.

6) Preparing and submitting incident reports in accordance with Article 1.06 of this Section.

7) Leading incident investigations on the Contractor's behalf.

8) Preparing and submitting daily health and safety field reports in accordance with Article 1.07 of this Section.

3. Health and Safety Technicians (as required):

a. Health and Safety Technicians (HST) utilized to supplement the SSO must have one year of hazardous waste site or related experience and be knowledgeable of applicable occupational health and safety regulations. The HST must be certified in CPR and first aid. The HST will be under direct supervision of the SO during on-site work. The HST must be familiar with the operations, maintenance and calibration of monitoring equipment used in this remediation. An HST will be assigned to each work crew or task in potentially hazardous areas.

B. Regulatory Requirements: Laws and regulations applying to the Work under this Section include, but are not limited to:

1. 29 CFR 1904 (OSHA), Recording and Reporting Occupational Injuries and Illnesses.

2. 29 CFR 1910 (OSHA), Occupational Safety and Health Standards.

3. 29 CFR 1926 (OSHA), Safety and Health Regulations for Construction.

4. 49 CFR 171.8, Transportation, Definitions and Abbreviations.

5. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).

1.03 SUBMITTALS

A. Informational Submittals:

1. The Contractor's SSHASP, in accordance with this Section. Submit within times indicated in Article 1.04 of this Section.

2. Job Safety Analyses (JSA) submittals for each action required for the Work that is not covered in the Contractor's SSHASP.

3. Reports:
    a. Daily Health and Safety Reports: submit in accordance with Article 1.07 of this Section.
    b. Accident Reports: submit in accordance with Article 1.06 of this Section.
4. Qualifications Statements:
    a. Qualifications for SSHASP preparer and SO, including copy of valid, applicable certifications.
5. Submit the following valid training certificates, as required:
    a. Initial 40-hour HAZWOPER training
    b. Initial 24-hour HAZWOPER training
    c. 8-hour HAZWOPER supervisor training
    d. Current 8-hour HAZWOPER annual refresher training

1.04 SSHASP AND JSA SUBMITTALS

A. Timing of Submittals:
1. Submit SSHASP the sooner of seven days prior to pre-construction conference, or 30 days prior to the Contractor's scheduled mobilization at the Site.
2. Do not perform Work at the Site until written SSHASP has been accepted by the Owner.
3. When an element of the Work or work activity is not covered by the SSHASP, prepare, and submit a JSA and obtain the Owner's acceptance of JSA before performing the work activity or activities covered by such JSA.
4. Delays in the Work Associated with Submittal or Review of SSHASP and JSAs:
    a. Notwithstanding other provisions of the Contract Documents, changes in the Contract Price or Contract Times will not be authorized due to delay by the Contractor in developing, submitting, revising, or obtaining acceptance of the SSHASP.

B. Limitations of the Owner's Review of SSHASP and JSAs:
1. The Engineer's review and acceptance of SSHASP and JSAs (if any) will be only to determine if the topics covered in SSHASP comply with the Contract Documents and specific requirements of safety documents referenced therein (e.g., Owner's safety programs, if any).
2. The Owner's review and acceptance will not extend to safety measures, means, methods, techniques, procedures of construction, or whether representations made in the SSHASP and JSAs (if any) comply with laws and regulations, or standards of good practice.
3. The Owner is not responsible for the Contractor's safety obligations under the Contract Documents.

1.05 CONTRACTOR'S HEALTH AND SAFETY PROGRAM

A. General:

1. Known prior use(s) of the Site are indicated.
2. Presence of Constituents of Concern (if any), where known to the Engineer and Owner, are indicated in the reports and drawings.
3. Each employer working at the Site shall adopt the prime Contractors SSHASP or develop and implement their own written SSHASP for their employees and other individuals for whom such employer is responsible.
4. When applicable (including when the Site includes one or more Hazardous Environmental Conditions), SSHASP shall comply with 29 CFR 1904, 29 CFR 1910, 29 CFR 1926, and other laws and regulations.
5. Include in the SSHASP requirements for complying with the Owner's Site-specific hazard/emergency response plans, if any. During the Project, comply with the Owner's hazard/emergency response plans.
6. Include in the SSHASP requirements for a Hazard Communication Program as required for the project scope.
7. The SSHASP is a deliverable product of this project. The Owner will review and comment on the Contractor's SSHASP. Agreed upon responses to comments will be incorporated into the final copy of the SSHASP. The SSHASP shall govern work performed for this contract. The SSHASP shall address, at a minimum, the items in accordance with 29 CFR 1910.120(I)(2).

B. Location:

1. Retain at the Site a copy of complete and accepted SSHASP, JSAs (if any), and related information.
2. Retain copy of SSHASP, JSAs (if any), and related information at the Contractor's project office.
3. Throughout the Project, update as necessary copies of SSHASP, JSAs, and related information.
4. Copies of SSHASP, JSAs, and other related information shall be made available to the Contractor's employees, Subcontractors, Suppliers, Owner, and Engineer immediately upon request.

C. SSHASP Content: SSHASP shall address and include the following:

1. Safety and health hazards of each phase of operations at the Site, including tasks to be performed adjacent to or on the water shall include requirements and procedures for employee protection.
2. The Contractor's organizational structure and other information required by Article 1.05.D of this Section.
3. Site description, history and comprehensive work plan.
4. Job safety and health risk or hazard analysis for each task and operation found in the work plan, including tasks to be performed adjacent to or on the water.
5. Employee training assignments including copies of current OSHA HAZWOPER 40-hour, 24-hour supervised field activities, 8-hour supervisors, and 8-hour refresher training certificates (as required) for each Contractor and Subcontractor employee assigned to the Project. Include initial training requirements for Site

workers and supervisors, exceptions to initial training requirements, Site briefings for visitors and workers, and refresher training requirements.

6. Personal protective equipment (PPE) to be used by employees for each task and activity performed, including PPE selection criteria, Site- and task-specific PPE ensembles, training in the use of PPE, respiratory protection, hearing conservation, and PPE maintenance and storage. It should be noted that the color of hard hats shall not be white or red as those colors are reserved for only Owner personnel.

7. Medical Surveillance Requirements: Medical clearance certificates for the Remedial Contractor and Subcontractor employees assigned to the Project. Provisions of the Site medical surveillance program, communication protocols between the Site, physicians, and workers, and medical recordkeeping procedures.

8. Exposure Monitoring Program: Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

    a. Monitoring procedures to detect the presence of hazardous substances.

    b. Monitoring procedures to determine worker exposures to hazardous substances and physical hazards.

    c. Action level and required responses for known and expected hazardous substances and physical hazards.

9. Site control measures, including procedures for:

    a. Preventing trespassing;

    b. Provide 24-hour Site security to prevent unqualified or unprotected workers from entering restricted areas;

    c. Preventing “tracking” of contaminants out of the Site;

    d. Maintaining log of employees at the Site and visitors to the Site;

    e. Communicating routes of escape and gathering points.

    f. Ensuring safe handling of Constituents of Concern during the Work, including excavating, handling, loading, and transporting activities. Include procedures for ensuring safety when working in or in proximity to Hazardous Environmental Conditions,

    g. Delineating “hot”/exclusion (e.g., contaminated), “cold”/contamination reduction, and support zones;

    h. Locating personnel and equipment decontamination zones; and

    i. Decontamination.

    j. First aid facilities including fully equipped first air station, and routine replenishment of supplies.

    k. Sanitary facilities including potable drinking water, washing facilities, and portable toilets.

l. Maintain a log of security incidents and visitor access granted.

m. Provide Site sign-in and sign-out for personnel having access to the project and maintain a record of Site access.

n. Approved visitors to the Site shall be briefed by the SO on safety and security, provided with temporary identification and safety equipment, and escorted throughout their visit.

o. Site visitors shall not be permitted to enter the hazardous work zone unless approved by the Engineer.

p. Project Site shall be posted, "Warning Hazardous Work Area, Do Not Enter Unless Authorized," and access restricted by the use of a snow fence or equal at a minimum. Warning signs shall be posted at a minimum of every 100 feet.

10. Heat stress prevention program.

11. Decontamination Program, in accordance with Section 02125 – Decontamination:

a. Location and type of temporary decontamination facilities.

b. General and specific decontamination procedures for personnel and PPE.

c. General and specific decontamination procedures for equipment and vehicles.

d. Disposal of residual waste from decontamination.

e. Decontamination of equipment and materials.

f. Monitoring procedures used to evaluate the effectiveness of decontamination.

12. Emergency Response Plan: Plan for safe and effective responses to emergencies, including necessary PPE and other equipment.

a. Potential emergencies that may occur at the Site.

b. Pre-emergency planning.

c. On-site emergency response equipment, materials, and PPE.

d. Emergency Maps: Evacuation routes, gathering points, and route to nearest hospital.

e. Emergency roles and responsibilities.

f. Emergency alerting and evacuation procedures for Site personnel.

g. Procedures for notifying, and list of emergency contact information for:

1) Emergency responders, including fire officials, ambulance service, poison control, police, and local hospitals.

2) Authorities having jurisdiction.

3) Owner and Engineer.

4) Contractor's project manager, Site superintendent, SO, and foreman.

5) Other entities, as required.

h. Emergency response procedures.

i. Emergency decontamination, medical treatment, and first-aid.

j. Emergency response training.

13. Community Protection Plan consisting of the following:

a. Develop, as part of this SSHASP, a Community Protection Plan (CPP). The CPP shall outline those steps to be implemented to protect the health and safety of surrounding human population and the environment, including, but not limited to, coordination with local firefighters/hazmat teams.

b. Air Monitoring consistent with applicable laws, ordinances, rules, regulations, and orders.

c. Off-Site Spill Response consisting of the following:

1) Produce as part of the SSHASP a Spill Response Plan, also coordinated with local officials, in case of an off-site spill of either liquid or solid wastes. The plan shall include transportation routes and times, as well as the minimum requirements set forth in the Subpart titled “On-Site Spill Containment Plan.” The driver shall be supplied with Material Safety Data Sheets (MSDSs), a 24-hour emergency phone number, and instructions for reporting emergencies to local agencies and the Site.

14. Spill containment program. Comply with Section 01110 – Environmental Protection Procedures.

15. Requirements for complying with Section 01110 – Environmental Protection Procedures.

16. Requirements for a Hazard Communication Program as required for the project scope. The program shall include the following, at a minimum:

a. Orientations that include the details of the project hazard communication plan.

b. Determination of training needs and coordination of training for affected employees.

c. Providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations, and ensuring that JSAs are performed.

d. Identify and address chemical safety issues during site inspections and JSAs, assist and oversee the designated personnel in conducting a hazardous substance inventory, maintaining SDSs, and labeling, review the need for further assessment of SDS for hazardous chemicals, exchange hazard communication documentation with subcontractors, and coordinate hazard communication training.

D. Contractor’s Organizational Structure:

1. Organizational structure portion of the SSHASP shall refer to or incorporate information on specific chain of command and specify the overall responsibilities of supervisors and employees, and shall include the following:
    a. Name and contact information for Contractor's "competent person(s)" for various work-related activities.
    b. Name and contact information for Contractor's safety representative.
    c. Designation of general supervisor who has responsibility and authority to direct operations involving handling of Constituents of Concern and work in or near Hazardous Environmental Conditions.
    d. Other personnel required for operations involving Constituents of Concern and Hazardous Environmental Conditions and emergency response, and general functions and responsibilities of each.
    e. Lines of authority, responsibility, and communication.
2. Review and update organizational structure as necessary to reflect current status of work activities on the Project and status of personnel.

E. Work Plan:

1. Comprehensive work plan portion of SSHASP shall refer to or incorporate information on the following:
    a. Tasks and objectives of work activities, onsite operations, and logistics and resources necessary to achieve such tasks and objectives.
    b. Anticipated activities and Contractor's normal operating procedures.
    c. Personnel and equipment requirements for implementing the work plan.

1.06 INCIDENT REPORTING AND INVESTIGATION

A. Immediately notify Owner and Engineer of incidents that:

1. Result in bodily injury, illness, and property damage.
2. Affect the environment.
3. Involve the public.

B. Comply with 29 CFR 1904.29, including using OSHA Forms 300, 300A, and 301 (or equivalent) to document accidents that result in bodily injury.

C. Accident Report Submittals:

1. Submit copies of completed accident reports to the Owner and Engineer within 24 hours of the accident. Include in each report the following:
    a. Date, time, and location of incident.
    b. Names of Site personnel involved in or affected by incident.
    c. Description of incident and activities being performed when incident occurred.
    d. Medical treatment administered, if any.
    e. Nature and seriousness of injury or damage.

2. By the tenth day of each month, submit monthly summary of accident reports from the prior month. Monthly summary report shall indicate for each accident the root cause and descriptions of corrective actions to reduce the probability of similar accidents.

3. Submit to the Owner and Engineer a copy of accident and health or safety hazard reports received from OSHA or other authority having jurisdiction within 24 hours of the Contractor's receipt.

D. Revise the SSHASP by modifying tasks or procedures to prevent the recurrence of accidents based on the findings of the accident investigation, if any.

E. Post current copy of the Contractor's OSHA 300A report, Summary of Work-related Injuries, and Illnesses, at a conspicuous place at the Site during period of February 1 through April 30 of each year.

1.07 DAILY HEALTH AND SAFETY FIELD REPORTS

A. Submit to the Owner and Engineer daily health and safety field reports signed by the Contractor's safety representative.

B. Content of the Contractor's Daily Health and Safety Field Reports: Reports shall include, but not necessarily be limited to, the following:

1. A summary of the work activities for that day
2. Weather conditions
3. Delays encountered in construction
4. Acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies.
5. Daily health and safety air monitoring results (when air monitoring is performed).
6. Documentation of instrument calibrations performed.
7. New hazards encountered.
8. PPE utilized.
9. Description of problems, real or anticipated, encountered during the Work that should be brought to attention of the Owner and Engineer and notification of deviations from planned Work shown in previously submitted daily health and safety field report(s).
10. Deviations from planned Work described in previously submitted daily health and safety field report(s).
11. A sign off from attendees

1.08 RECORDS

A. Retain at the Site complete and accurate health and safety records for the Contractor and Subcontractor employees assigned to the project. Records shall include, at a minimum, the following:

1. Valid training certificates, as required:
   a. Initial 40-hour HAZWOPER training.
   b. Initial 24-hour HAZWOPER training.

c. 8-hour HAZWOPER supervisor training.

d. Annual 8-hour HAZWOPER refresher training.

e. 10-hour construction safety training.

f. First-aid/CPR training.

g. Other training required by the Contractor's SSHASP.

2. Valid medical clearance certificates.

3. Valid respirator fit test certificates.

4. Incident reports, prepared in accordance with Article 1.06 of this Section.

5. Daily health and safety field reports, prepared in accordance with Article 1.07 of this Section.

6. Other records required by Laws and Regulations.

B. Keep records up-to-date throughout the project.

C. Contractor's SO shall meet at least monthly with the Owner and Engineer to review the Contractor's health and safety records and verify compliance with this Section.

D. Retain at an off-site location complete health and safety records as outlined under Article 1.08.A. of this Section for a period of no less than three (3) years after completion of Site work, unless a longer period is required by a regulatory agency. The Contractor shall explain the recordkeeping and document retention program. At a minimum, the Contractor's recordkeeping and document retention program shall describe the following:

1. The information recorded for inspection, audit, and incident investigation findings.

2. How inspection, audit, and incident investigation findings are accessed and preserved, and how corrective actions are tracked to closure, and how closure records are accessed and preserved.

3. The information contained in training records

4. How training records are accessed and preserved.

5. The information contained in industrial hygiene and medical monitoring records.

6. How industrial hygiene and medical monitoring records are accessed and preserved.

7. How compliance programs and other programmatic documents (including safety data sheets) are accessed and preserved.

1.09 STANDARD OPERATING PROCEDURES

A. The following are Standard Operating Procedures (SOPs) that should be employed as part of the H&S program:

1. Footwear used on Site will be covered by rubber over boots or booties when entering or working in the Exclusion Zone area or Contamination Reduction Zone. Boots or booties will be washed with water and detergents to remove dirt and contaminated soil before leaving the Exclusion Zone or Contamination Reduction Zone.

2. The Contractor will ensure that project personnel shall have vision or corrected

vision to at least 20/40 in one eye.

3. Eating, drinking, chewing gum or tobacco, smoking, etc., will be prohibited in the hazardous work zones and neutral zones.

4. Alcohol, firearms, or drugs (without prescriptions) are prohibited on Site.

5. Personnel who are on medication should report it to the SO, who will determine whether or not the individual will be allowed to work and in what capacity. The SO may require a letter from the individual's personal physician stating what limitations (if any) the medication may impose on the individual.

6. Provide equipment and personnel necessary to monitor and control air emissions. The determination of the proper level of protection for each task and safety equipment shall be the responsibility of the Contractor. These task specific levels of protection shall be stated in the Contractor's SSHASP.

7. Provide a portable decontamination station, commonly referred to as a "Boot Wash" facility for each hazardous work zone requiring decontamination for project personnel. These facilities shall be constructed to contain spent wash water, contain a reservoir of clean wash water, a power supply to operate a pump for the wash water, a separate entrance and exit to the decontamination platform, with the equipment being mobile, allowing easy transport from one hazardous work zone to the next. Such wash water shall be disposed of at the dewatering facility. An appropriate detergent such as trisodium phosphate shall be used.

8. Provide full decontamination facilities at hazardous zones. Decontamination facilities must be described in detail in the SSHASP.

9. Contaminated clothing, used respirator cartridges, and other disposable items will be put into drums/containers for transport and proper disposal in accordance with applicable requirements.

10. Equipment and material used in this project shall be thoroughly washed down in accordance with established federal and state procedures before it is removed from the project. Certify, in writing, that each piece of equipment has been decontaminated prior to removal from the Site.

11. Site personnel have stop work authority if unsafe conditions are observed.

12. A master telephone list will be developed and prominently posted at the field office. At minimum, the list will have telephone numbers of project personnel, emergency services including hospital, fire, police, and utilities. In addition, two copies with telephone numbers are to be given to the Owner for emergency reference purposes.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

** END OF SECTION 01100 **

SECTION 01350

DOCUMENT SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. The purpose of this Section is to define the roles and responsibilities of the Contractor, Engineer, and Owner in the submittal process and to present the procedures for review, approval, and final disposition of Contractor submittals during the construction phase.

B. This specification applies to all incoming or outgoing documentation originated by the Contractor throughout the duration of the project.

C. The Contractor is responsible for submitting the various work plans, drawings, and analysis as indicated within these specifications and drawings. Submittals include (but are not limited to) the following work plans, major design submittals, and other work plans as indicated within these specifications and drawings:

1. Comprehensive Submittal Schedule
2. Project Staffing Chart
3. Submittal Register
4. Construction Progress Schedules
5. Pre-Condition survey
6. Construction Work Plan
7. ISS Work Plan
8. Contractor Health and Safety Plan
9. Waste Management Plan
10. Proposed Products List
11. Shop Drawings
12. Design Data (as required)
13. Test Reports
14. Certificates
15. As-Builts

1.2 SUBMITTAL REQUIREMENTS

A. General: The submittal of all documentation will include:

1. Dimensions and calculations are to be in standard units
2. Language Requirements: English
3. All documents must be numbered appropriately (See Paragraph 1.04.B)
4. Submittals shall include a document transmittal form

B. Documents shall contain sufficient information to enable the Owner and Engineer to provide adequate review.

C. Project Management and Documentation Software

1. Project Collaboration Portal/SharePoint Site/Project Website – The Engineer and Contractor may utilize, as appropriate, a Microsoft SharePoint Site which is accessible through the internet and allows for uploading and downloading of files while working in the field. Documents uploaded by the Contractor will not be accessible by any other group other than the Engineer and Owner. If outside parties are required to review the documents, then the files will be transferred appropriately.

2. Project Software Access

   a. Receive permission from the Website Administrator to access the Project Website. Permission will be assigned based on the intended use and activity of the Contractor.

   b. Receive an email from the Website Administrator that provides a username, password, and appropriate instructions for access.

D. Submittals shall be labeled with the submittal number which shall also be included on the Document Transmittal Form.

1.3 SCHEDULE OF SUBMITTALS

A. Schedule of Submittals: The Contractor shall submit within (15) fifteen business days after award of contract or as specified in special conditions, a schedule for the submission of shop drawings, samples, concrete design mixes and other data. Contractor shall identify all of the submittal items required by the Contract Documents on the Comprehensive Submittal Schedule. At a minimum, the schedule shall show necessary submission dates, Con Edison and/or Engineer review time, revision time, re-submittal time, and final deliverable date for the approval of all plans, shop drawings, samples, product data, schedules, etc.

B. In preparing the Comprehensive Submittal Schedule, Contractor shall consider the nature and complexity of each submittal item and shall allow ample time for review, revision or correction. Submittals (including re-submittals) will typically be returned to Contractor within 10 business days following receipt of the submittal. Contractor shall schedule to have all submittals approved at least 10 business days prior to mobilization of the submitted item to the Site.

C. Con Edison will review the Comprehensive Submittal Schedule to determine its completeness and compatibility with the project schedule. A Submittal Schedule that is incompatible with the project schedule or a review schedule that places extraordinary manpower demands on Con Edison will be sufficient reason(s) to reject the Comprehensive Submittal Schedule.

1.4 SUBCONTRACTOR LIST

A. The contractor shall submit electronically for Con Edison's approval, a complete list of subcontractors, with name, address, OSHA incident rate, EMR, and experience prior to start of construction or sooner. (See SCCR figure 4 for the subcontractor list form)

B. No work on the Contract shall commence until Con Edison in writing has approved all the proposed subcontractors.

C. If the Contractor plans to use a subcontractor that is not on the original subcontractor list submittal, the Contractor may propose in writing (electronically), alternative or additional subsidiary subcontractors for Con Edison's approval. The same information identified above shall be provided for the alternative subcontractors or additional subcontractors.

1.5 CONSTRUCTION WORK PLAN

A. Submit three (3) copies of the Construction Work Plan for review and acceptance, two (2) weeks prior to the Pre-Construction meeting. Sign and seal the final engineered designs required by Contract Documents by a Professional Engineer licensed to practice engineering in the State of New York.

B. Perform no work at the site, with the exception of site inspections and surveys, until the Construction Work Plan is approved. Allow thirty (30) calendar days in the schedule for Con Edison review and approval. No adjustment for time or money will be made if re-submittals of the Plan are required due to deficiencies.

C. The Construction Work Plan submittal shall contain at a minimum:

1. Project Plan
    a. Proposed Project Schedule in Microsoft Project and Adobe pdf;
    b. Project Staffing Chart for Personnel
    c. List of Subcontractors
    d. Resumes and qualifications for key personnel:
        1) Contractor's Project Manager
        2) Contractor's Project Superintendent
        3) Contractor's Professional Engineers and Surveyor
            a) Excavation and Earth Support System Design (as required)
            b) Pre-, Post-Construction Survey, Excavation Survey, As-Built Survey and Monitoring Plan
            c) Water Treatment System Design
        4) Contractor's Quality Control Manager
        5) Contractor's Site Safety Officer
        6) Any major Subcontractor's Superintendents
    e. Training Certificates of key personnel
        1) Applicable Certificates from key personnel above
    f. Material Safety Data Sheets for all chemicals brought on site
2. Pre and Post Construction Condition Survey
    a. Provide the required submittals as described in Section 13091 – Structural Monitoring.
3. Site Preparation Plan
    a. Mobilization and general layout,
    b. Temporary facilities,
    c. Utilities,
    d. Equipment and materials staging areas,

e. Layout of water treatment system/construction water storage area

f. Contaminated materials segregation and storage areas.

4. Selective Demolition Plan

a. Provide the required submittals as described in Section 01732—Selective Demolition

5. Sequencing Plan

a. Temporary Sedimentation and Erosion Controls

b. Ingress and egress

c. Personnel and equipment decontamination facilities

d. Proposed sequence, equipment and methods for the performance of the following:

1) Noise Mitigation Plan as described in Section 01110—Environmental Protection Procedures.

2) Method of excavation and equipment to be used:

a) Excavation and Earth Support Designs, Monitoring Plans, Pre-Construction Surveys, and dewatering designs as required by the NYC Building Code

b) Earth support system design (if applicable) signed and sealed by a Professional Engineer licensed in the State of New York.

c) Dewatering design and temporary water treatment system (if applicable) signed and sealed by a Professional Engineer licensed in the State of New York.

3) Removal of asphalt/concrete surfaces and excavation of material, including:

a) Management of concrete and asphalt for disposal as construction and demolition debris

b) Demolition and removal of subsurface structures and debris;

c) Excavation, segregation, stockpiling, waste characterization and disposal of material

d) Decontamination procedures for personnel and equipment

4) Installation of proposed stormwater management system

5) ISS

6. Materials Management Plan

a. Details on methods for managing each material resulting from the demolition and excavation. Include detail on the segregation, storage methods, containers, stockpiles, locations, etc.

b. Include a section pertaining to soil rendering and moisture conditioning, as necessary, to make the excavated material suitable for both transportation and for ultimate treatment or disposal.

7. Construction Water Treatment/Disposal Plan
   a. If Contractor elects to treat and dispose of construction water on site, a description of the on-site water treatment system, including process flow diagram, general arrangement drawings, process and instrumentation diagrams, operation and maintenance plan, sampling and analysis plan to ensure NYCDEP treatment standards are met as required.
   b. Alternately, description of the method for storage, waste characterization, transfer to transporters and off-site disposal of construction water.
8. Contractor Quality Control Plan, as described in Section 01450 Quality Control
9. Noise Mitigation Plan
   a. Prepare a plan for monitoring and controlling noise created during construction, as described in section 01110 - Environmental Protection Procedures.
10. Dust and Odor Control Plan
    a. Compliance with Community Air Monitoring Plan (CAMP) action limits.
    b. Contingency methods to control odor and dust
11. Spill Prevention and Contingency Plan, including:
    a. Refueling and servicing of equipment.
    b. On site storage of fuels and oils.
    c. Stored liquids from excavations, stockpiles or roll offs.
    d. Water treatment unit/construction water related storage
12. Decontamination Plan
    a. Details on Decontamination procedures for equipment and materials used within the work area.
    b. Details on preventing cross contamination between equipment and tools during various phases of work
13. Site Security Plan
    a. Site security procedures for personnel and Subcontractors
    b. Temporary barriers, fencing and restricted zones for both vehicular and pedestrian traffic
    c. Site traffic flow pattern
    d. Maintenance of site access to emergency vehicles
14. Proposed Products List
    a. As described in this Section.
15. Proposed Project Staffing Chart
    a. As described in this Section.
16. Proposed Subcontractors
    a. As described in this Section.

1.6 SUBMITTAL PROCEDURES

A. Email or upload the required documents to the Project Collaboration Portal.

B. Distribute the submittal documents to the Engineer/Owner for appropriate management, engineering/ design, and project control document review.

C. Incomplete or inadequate submittals will be returned without review.

D. Following the Engineer/Owner document review, submittal will be returned with the disposition based on the review.

1. The submittal response will be uploaded to the Project Collaboration Portal.

2. The Contractor will be notified that the submittal has been reviewed via email.

3. The Engineer will provide a disposition to each reviewed submittal.

a. Action Submittals: Each submittal will be given one of the following dispositions:

1) No Exceptions
2) Exceptions as Noted
3) Revise and Resubmit
4) Submittal Incomplete/Resubmit
5) Not Subject to Review

b. Informational Submittals:

1) The following types of Informational Submittals, when acceptable to the Engineer, will not receive a written response from the Engineer. Disposition as “Accepted” will be recorded in the Engineer’s submittal log. When submittals of the following are not acceptable, the Engineer will provide a written response to the Contractor:

a) Safety data sheets.
b) Manifests and other shipping documents.
c) Delivery tickets.
d) Compaction testing reports.
e) Concrete testing reports.
f) Manufacturer's instructions.

c. Closeout Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Closeout Submittals will not receive a written response from the Engineer. Disposition as “Accepted” will be recorded in the Engineer’s submittal log. When Closeout Submittal is not acceptable, the Engineer will provide written response to the Contractor.

d. Maintenance Material Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Maintenance Material Submittals will not receive a written response from the Engineer. Disposition as “Accepted” will be recorded in the Engineer’s submittal log. When Maintenance Material Submittal is not acceptable, the Engineer will provide written response to the Contractor, and the Contractor is responsible for costs associated with transporting and

handling of maintenance materials until compliance with the Contract Documents is achieved.

4. If comments or revisions are provided by the Engineer, the Document Control Coordinator shall return redlined submittals showing changes, and/or comments to the Contractor either electronically or on hardcopy, as appropriate for the document submittal.

5. A document transmittal shall be included identifying disposition, comments, and include the statement "*Action taken hereon does not supersede requirements of applicable design drawings, specifications, orders, codes or regulations, or relieve the Contractor or Supplier from responsibility for errors or omissions*."

6. Resubmit revised documents when the "Resubmit" disposition is indicated. Do not proceed with work unless the "Proceed with Work" disposition is indicated.

1.7 TRANSMITTAL PROCEDURES

A. Include a document transmittal form with the submittal.

B. Document transmittal forms must include:

1. The Project or Purchase Order Number., and reference for the submittal (i.e., specification number, drawing number, health safety requirements).

2. The transmittal will also include a statement indicating that the document(s) provided for review meet all requirements of the Contract Documents or will explicitly indicate exceptions and/or substitutions.

1.8 REVIEW PROCEDURE

A. Submit documentation in accordance with the agreed dates. Contractor is responsible for planning the work and providing the submittals allowing for the review and resubmittal time frames listed below without causing delays in the work.

B. The Engineer/Owner shall review the documentation within two (2) weeks following the submittal.

C. The Contractor shall have up to one (1) week to revise and make any necessary comments. The Contractor may request additional revision time if needed based on the extent of comments. The Engineer/Owner must acknowledge and confirm extension in writing to the Contractor.

D. The Engineer/Owner shall have one (1) week to review and return any resubmitted documents.

E. Subsequent reviews and resubmittals will follow the guideline of a one (1) week review cycle.

F. At the request of the New York State Department of Environmental Conservation (NYSDEC), Contractor submittals will be made available for NYSDEC information.

1.9 REQUEST FOR INFORMATION

A. The Contractor may request additional information/clarification from the Engineer through a Request for Information (RFI) process and submittal of the RFI Form.

B. Email or upload a completed RFI form to the Project Collaboration Portal and notify the Engineer/Owner and Document Control Coordinator via email.

C. RFI Forms shall be numbered sequentially.

1. Example: RFI-01; RFI-02.

*** END OF SECTION 01350 ***

SECTION 01450

QUALITY CONTROL

PART 1 – GENERAL

1.1 SUMMARY

A. This section covers the general quality control (QC) requirements for equipment, materials, and services supplied by the Contractor during construction.

B. Ensure the Work meets the requirements of the Contract Documents. Perform construction Work in the presence of Owner and the Engineer. Cooperate with Owner and the Engineer in regard to inspection, sampling/testing, analysis, and monitoring.

C. QC testing includes, but is not limited to, inspection of the following construction-related activities and laboratory and materials testing related thereto:

1. Survey equipment calibration verification.
2. Excavation limits verification.
3. Imported fill materials testing.
4. Metering of reagents for in-situ stabilization/solidification at the specified quantities and/or weights.
5. In-situ stabilization/solidification performance testing and verification of overlap with prior, adjacent stabilized soil masses.
6. Waste characterization testing.
7. Excavation support/protection installation and steel welding inspections (if needed).
8. Fill, compaction, and grading requirements.
9. Asphalt pavement and concrete testing.
10. Site restoration.

D. Include procedures for controlling activities related to inspection, testing, and documentation, including those of all subcontractors, suppliers, laboratories, and purchasing agents.

1.2 REFERENCES AND STANDARDS

A. For products or workmanship specified by association, trade, or other consensus standards comply with the requirements of the standard, except when more conservative requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

1.3 SUBMITTALS

A. Construction Quality Control Plan (CQCP) to be submitted as part of the Construction Plan and in accordance with Specification Section 01350 – Document Submittal Procedures. CQCP shall include, at a minimum:

1. Provide a qualified QC engineer to perform and/or oversee all QC procedures performed during construction.

    a. Required qualifications of the QC engineer are a minimum five (5) years of experience as a QC engineer on projects of similar scope and size.

    b. Provide the resume of the QC engineer for review by Engineer and Owner.

2. Authorities and responsibilities of inspection and testing personnel.

3. Experience and qualifications of inspection and testing personnel to be assigned and name and location of the third-party testing facility to be used, including resumes.

4. Description of the testing facilities and information on when and where each of the required materials tests will be performed.

5. Testing plan including frequency, reference American Society of Testing Materials (ASTM) or other applicable standards, acceptance criteria and data validation procedure.

B. Provide Engineer with copies of chain-of-custody forms along with test results and laboratory quality assurance documentation.

C. Mark all submittals in accordance with provisions of Specification Section 01350 – Document Submittal Procedures.

D. Submit finalized copies of all documents relating to the QC of construction activities to the Engineer and Owner in a timely fashion for final reviews to be made without interrupting schedule of work.

E. Provide Engineer with test results and certifications from manufacturers as part of the QC Plan for review prior to delivery of materials to the Site.

F. Provide Engineer with the opportunity to collect duplicates for any samples a minimum of ten (10) business days prior to installation of materials on Site.

1.4 EQUIPMENT CALIBRATION CERTIFICATION:

A. Within three (3) business days prior to commencing with work requiring testing, provide Engineer with certification of laboratory equipment calibration to meet appropriate ASTM standards.

1.5 CONSTRUCTION QUALITY CONTROL

A. QC engineer responsibilities:

1. Responsible for management of QC activities in the field. All other QC personnel employed by either the Contractor or his Subcontractors report to the QC engineer.
2. Physically on-site whenever the Work is in progress.
3. Possess adequate skills and training to be knowledgeable about the QC work specified in the CQCP and capable of implementing the CQCP.

B. Actively monitor QC over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

C. Comply with manufacturers' instructions, including performance of each step in sequence.

D. Should a manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements apply.

F. Perform work by persons qualified to produce specified quality.

G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

1.6 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable work. Do not permit tolerances to accumulate and compound.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.7 CONSTRUCTION QUALITY CONTROL TESTING SERVICES

A. Appoint, employ, and pay for specified services of an independent testing laboratory (ITL) qualified to perform QC testing in accordance with the testing requirements of the Technical Specifications.

B. Have ITL perform QC tests and other services specified in individual specification sections.

C. Arrange for collection of duplicate samples with Engineer a minimum of 24 hours prior to sample collection. Collection of duplicate samples shall be at the discretion of the Engineer.

D. Testing and source QC may occur on or off the project site. Notify Engineer of all in situ sampling or other tests at least 24 hours prior to testing activities.

E. Submit reports by the ITL to Engineer in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

F. Coordinate Work with the ITL; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested:

1. Notify Engineer 24 hours prior to expected time for operations requiring services.

2. Any test, or other services provided by the ITL, performed without prior knowledge of the Engineer, will be automatically rejected and materials tested subject to rejection and removal. Re-testing on these materials will be performed at no cost to the Owner.

G. Construction QC testing does not relieve Contractor from performing work to Contract requirements.

H. Maintain a log of all test and samples conducted: Indicate date, time location (on-site tests), reference specification method and personnel present at time of sampling/testing.

I. Maintain accurate, thorough files of sample and material disposal chain-of-custody forms.

1.8 CONSTRUCTION QUALITY ASSURANCE TESTING SERVICES

A. The Engineer will, at its discretion, appoint, employ, and pay for specified services of an independent laboratory qualified to perform the required construction QA testing.

B. Cooperate with the Engineer's QA testing laboratory; furnish duplicate samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested:

C. Construction QA testing by the Engineer does not in any way relieve Contractor to perform Work to Contract requirements including, but not limited to, QC tests and documentation.

D. Tests results by the Engineer's QA testing laboratory will be compared with those prepared by the Contractor's ITL. Test results that indicate variance of more than 5 percent, or non-conformance with the specified requirements may require retesting at the Engineer's discretion. Costs for all retesting, both QC and QA, will be the responsibility of the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EQUIPMENT CALIBRATION

A. All equipment utilized for QC field testing, QC testing, and laboratory tests are to be calibrated according to the applicable and appropriate ASTM standards within the immediate twelve (12) months prior to use for this project. If applicable and appropriate ASTM standards are not available, use of the equipment manufacturer's recommended methods is acceptable.

B. Certification of equipment calibration by the QC engineer is to be submitted to the Engineer a minimum of three (3) business days prior to use for this project.

C. Should significant variance, as determined by the Engineer, in test data or measurement occur, and there is reason to believe that it may be attributed to the equipment rather than to the material or test procedures, recalibration will be required, and subsequent documentation of satisfactory calibration activities will be submitted.

D. Documentation is required for all re-calibration efforts performed on equipment used for this project.

E. Engineer may review both the sampling and testing procedures prior to implementation for this work. The testing laboratory (including equipment and personnel) should be fully operational and available for review at least 48 hours (two business days) prior to utilization for on-site QC testing support.

3.2 EXAMINATION

A. Verify that existing site conditions and work surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in individual Technical Specification sections.

C. Immediately notify Engineer of discrepancies or unacceptable site conditions prior to commencing with new Work.

3.3 PROTECTION

A. Protect completed work elements from damage during ongoing construction operations.

B. Protect completed work from sediment, debris, or other materials found on-site.

C. Store and handle products in accordance with the manufacturer's instructions.

3.4 INSPECTIONS

A. Provide inspections of Work as specified in the Technical Specifications.

3.5 TESTING

A. Provide testing of Work as specified in the Technical Specifications.

*** END OF SECTION 01450 ***

SECTION 01510

TEMPORARY UTILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. This section includes the requirements to provide temporary utilities and facilities for required for the Work, including the following:
    a. Electricity
    b. Lighting
    c. Communications
    d. Heating, cooling, ventilating, and temporary enclosures
    e. Water
    f. Fire protection
2. Arrange with utility owners for temporary utilities and with others as appropriate for temporary facilities. Obtain required permits and approvals for temporary utilities and temporary facilities.
3. Service costs for utilities and facilities indicated in this Section is the Contractor's responsibility.
4. At minimum, provide and maintain temporary utilities and temporary facilities through Substantial Completion unless otherwise approved in writing by the Engineer.
5. Maintain, including cleaning, temporary utilities, and temporary facilities, and continuously provide consumables (i.e., potable water, soap, paper towels, toilet paper, etc.) as required.
6. Temporary utilities and temporary facilities shall be adequate for personnel using the Site and the needs of the Project.
7. Provide temporary utilities and temporary facilities in compliance with Laws and Regulations and, when applicable, requirements of utility owners.
8. Provide and maintain methods, equipment, materials, and temporary construction as required to control environmental conditions at the Site and adjacent areas. Maintain temporary controls until no longer required. Temporary controls include, but are not limited to, the following:
    a. Erosion and sediment controls
    b. Control of surface water, including stormwater run-on and run-off
    c. Sheen controls
    d. Odor, vapor, and dust controls
    e. Pollution controls

f. Noise controls

9. Comply with applicable federal, state, and local codes, ordinances, regulations, statutes, and standards.

10. Exclusion Zones will be defined and operated as described in 29 CFR 1910.210 Hazardous Waste Operations.

1.2 REQUIREMENTS FOR TEMPORARY UTILITIES AND TEMPORARY FACILITIES

A. Electrical:

1. Provide temporary electrical service required for the Work, including continuous power for temporary field offices and sheds. Provide temporary outlets with circuit breaker protection and ground fault protection.

2. Provide written plan for electrical service including approved service requests and work orders, as applicable.

3. Provide materials that comply with applicable NEMA, NECA, and UL standards and governing regulations of temporary electrical services.

4. Provide grounded extension cords with waterproof connectors and GFCI protection. Use "hard service" cords where there is exposure to abrasion and traffic.

5. Provide general service lamps and guard cages or tempered glass enclosures where lamp is exposed to breakage by removal operations. Use liquid-tight enclosures or boxes for the devices.

6. Provide a weatherproof, grounded temporary electrical power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of the work.

7. Install overload protection and disconnect switches for each temporary circuit at the power source.

8. Install cable or extension cords in the work area in such a manner that visual surveillance is easily accomplished.

B. Lighting:

1. Provide lighting at the Site of not less than five foot-candles for open areas and not less than ten foot-candles for stairs and shops. Provide not less than one, 300-watt equivalent lamp every 15 feet in indoor work areas. Provide night security lighting of not less than five foot-candles within 50 feet of the perimeter of the Site during hours of darkness, controlled by photocell.

2. Do not work in areas with insufficient lighting. Where lighting is insufficient for the work activities to be performed, provide additional temporary lighting.

3. Provide temporary lighting sufficient for observation of the Work by the Engineer and inspection by authorities having jurisdiction. Where required by the Engineer, provide additional temporary lighting.

4. Provide temporary lighting for Engineer's field office in accordance with Specification Section 01521 – Temporary Field Offices and Structures.

C. Communications:

1. Provide temporary telephone and communications for Engineer's field office in accordance with Specification Section 01521 – Temporary Field Offices and Structures.

D. Heating, Ventilating, and Enclosures:

1. Provide sufficient temporary heating, cooling, ventilating, and enclosures to ensure safe working conditions and prevent damage to existing facilities and the Work.

2. Maintain temperature of areas occupied by Owner's personnel or electronic equipment, including offices, lunchrooms, and rooms containing computers, microprocessors, and control equipment, between 65°F and 80°F with relative humidity less than 75 percent.

3. Required temperature range for storage areas and certain elements of the Work, including preparation of materials and surfaces, installation or application, and curing as applicable, shall be in accordance with the supplementary conditions for the associated Work and/or the Supplier's recommended temperature range for storage, application, or installation, as appropriate.

4. Provide temporary ventilation sufficient to prevent accumulation in construction areas and areas occupied by Site personnel of hazardous and nuisance levels or concentrations of dust and particulates, mist, fumes or vapors, odors, and gases, associated with construction.

5. Provide temporary enclosures and partitions required to maintain required temperature and humidity.

6. Provide temporary heating, ventilating, and cooling for the Engineer's field office in accordance with Specification Section 01521 – Temporary Field Offices and Structures.

E. Water:

1. General:

a. Provide temporary water facilities including piping, valves, meters if not provided by Owner of existing waterline, backflow preventers, pressure regulators, and other appurtenances. Provide freeze-protection as required.

b. Ensure that adequate water flow and pressure is maintained to support Work during the Project, until removal of temporary water systems.

2. Water for Construction Purposes:

a. Provide water for Site maintenance and cleaning, water necessary for construction activities, and water for disinfecting and testing of systems.

3. Water for Human Consumption and Sanitation:

a. Provide potable water in accordance with New York State Department of Health (NYSDOH) Laws and Regulations for consumption by personnel at the Site, for field offices, and for sanitary facilities.

b. Provide potable water for use and consumption by personnel at the Site, including the Contractor, Engineer and visitors to the Site.

c. Provide temporary water for the Engineer's field office in accordance with Specification Section 01521 – Temporary Field Offices and Structures.

d. Provide separate sanitary facilities for males and females.

e. Provide and maintain portable hand wash stations.

F. Fire Protection:

1. Provide temporary fire protection, including portable fire extinguishers rated not less than 2A or 5B in accordance with NFPA 10, Portable Fire Extinguishers, for each temporary building

2. Provide Class A (ordinary combustibles), Class B (combustible liquids and gases), and Class C (electrical equipment) fire extinguishers, as necessary.

3. Comply with NFPA 241, Standard for Safeguarding Construction, Alternation, and Demolition Operations, and requirements of fire marshals and authorities having jurisdiction at the Site.

4. Provide temporary fire protection for the Engineer's field office in accordance with Specification Section 01521 – Temporary Field Offices and Structures.

G. Staging Areas:

1. Staging areas shall be located on the Site in areas (exclusion zone) approved by the Engineer in order to minimize possible cross contamination.

2. Where practicable, excavated waste materials shall be direct loaded into off-site waste transportation vehicles.

3. Where waste materials must be stockpiled, they shall be stockpiled on prepared, bermed, and lined pads, or alternative, as approved by the Engineer; and include sump installation to intercept runoff and prevent dispersal of sediments.

4. Waste materials shall remain covered with a minimum 6-mil sealed, watertight, polyethylene liner to prevent contaminated runoff. Remove the liners when the staging area is no longer needed and dispose of off-site.

5. Individual stockpiles shall not exceed 500 cubic yards and shall be separated based on waste material type (i.e., TSCA PCB material and non-TSCA PCB material). Excess soil shall be stockpiled and managed onsite or disposed of offsite, as directed by the Engineer.

6. Staging areas shall be constructed to prevent the spread of contamination to the surrounding soils, surfaces, and/or groundwater.

7. Water spray or equivalent shall be utilized as necessary to prevent dust generation. Monitoring shall be provided to ensure that unacceptable levels of dust generated from the movement and handling of soil do not migrate from the Site.

8. Shop Drawings of staging areas shall be submitted by the Contractor to the Engineer for review and approval prior to the start of work.

9. Decontaminate staging areas on temporary decontamination pads, as directed by the Engineer, and in accordance with Specification Section 02125 – Decontamination.

10. Clean soil staging areas: can be located outside the exclusion zone over non-remedial areas, as applicable, erosion controls shall be maintained at the perimeter of piles. Stockpiles shall be covered when not in use with a minimum of 6-mil poly liner. Long-term storage of piles may require additional stabilization measures, as directed by the Engineer or required in the Supplementary Conditions.

11. Materials staging area: provide and maintain material staging areas as needed in locations indicated on the Contractor's work site layout, or as approved by the Engineer.

12. Store tools and materials on an elevated platform when not in use to prevent damage due to standing water or surface water runoff. Keep storage areas covered, protected, and maintained.

H. Temporary (Work Zone) Security Fencing:

1. Work Zone Security Fencing, unless otherwise detailed in the Supplementary Conditions, provide temporary privacy screening on existing chain link fencing around the site. Provide supplemental temporary chain link fencing around the operations and work areas to control access as shown on the Drawings. Fence posts shall be adequately supported to prevent leaning or overturning due to wind loading. Fence posts shall be set a maximum 10 feet apart.

2. Elevated structure privacy screening, unless otherwise detailed in the Supplementary Conditions, provide a temporary 7' high privacy screen on elevated portions of the pedestrian walkway exposed to construction. Privacy screening shall be adequately supported to handle wind loading.

3. Supplement fencing and privacy screen with temporary impermeable screening adjacent to pedestrian access points to mitigate potential for splash and/or "struck by" hazards.

4. Perimeter/Security Fencing, unless otherwise detailed in the Supplementary Conditions, shall consist of existing chain link fencing with temporary privacy screening.

I. Water Control:

1. Conform to erosion and sedimentation control measures established by the New York City Department of Environmental Protection, standards contained in the New York State Department of Environmental Conservation Standards and Specifications for Erosion and Sediment Control (November 2016 or most recent version); the Storm Water Pollution Prevention Plan (SWPPP), the Contract Documents and Technical Specifications, Specification Section 01110 – Environmental Protection Procedures, and applicable federal, state, or local regulations.

J. Pollution Control:

1. Maintain work areas on and off-site free from further environmental pollution that would be in violation of federal, state, or local regulations.

2. Prohibited Construction Practices include, but are not limited to, the following:

a. For stream corridors, wetlands, surface waters or unspecified locations:

1) Dumping of spoil material

2) Indiscriminate, arbitrary, or capricious operation of equipment

3) Pumping of silt-laden water from trenches or other excavations

4) Disposal of trees, brush, and other debris.

b. Unspecified alteration of the flow line of streams.

c. Explosive blasting.

d. Burning of refuse and debris at the project Site.

e. Disposal of construction water without treatment as per Specification Section 02145 – Water Treatment and Disposal.

3. Minimize air pollution by wetting down bare soils with clean water, requiring use of properly operating combustion emission control devices on construction vehicles and equipment used by the Contractor, and requiring shutdown of motorized equipment not actually in use.

4. Suppress emissions during Site activities that may have an adverse health effect on workers or the community to the extent possible.

5. Chemicals used, whether herbicide, pesticide, disinfectant, polymer, reactant, or other classification, must be approved by the New York Department of Environmental Conservation (NYSDEC) or other applicable regulatory agency and the Engineer and be used in a manner as their original purpose was intended.

6. Use of such chemicals and disposal of residues shall be in conformance with manufacturers' instructions.

7. Use of chemicals must be approved in advance by the Engineer.

8. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer system or into streams or waterways is not permitted.

9. Volatile wastes generated will be handled as hazardous wastes and reported to NYSDEC.

10. Ensure that the generated project hazardous waste (if applicable) and existing hazardous waste to be removed under this project are transported, manifested, and disposed of in accordance with the current regulations.

11. Comply with procedures outlined in Specification Section 02120 – Off-Site Transport and Disposal.

K. Traffic Control:

1. Maintain on-site temporary roads necessary for performance of the Work. Temporary access roads will be repaired as necessary to insure unimpeded daily operations. This may include at a minimum, routine grading and repairs to areas subject to settling resulting from site-related traffic.

2. Park vehicles in areas designated and approved in the Work Plan.

3. Keep the designated parking areas clear of dirt and debris resulting from the Work.

L. Rubbish Control (Noncontaminated)

1. Clean up the debris resulting from the Work at the end of each day and leave work areas clean. Locate containers where directed.

2. Remove debris from the Site at least once a week or more often if it presents a fire hazard or becomes excessive. Burning of waste material is prohibited.

3. Containers shall have secure tops.

M. Protection of Natural Resources:

1. General:

a. Preserve the natural resources within the project Site that are not specified for removal or change or in accordance with supplementary permit conditions.

b. Preserve the natural resources outside the project Site impacted by the Work.

c. Conform to federal, state, and local permitting requirements.

d. Restore disturbed resources to an equivalent or improved condition upon completion of work.

e. Vehicles, equipment, and machinery delivered or used at the Site that have visible oil or hydraulic leaks will not be allowed on Site. Clean up oil or hydraulic fluid spills immediately.

2. Land Resources:

a. Except in areas specified to be cleared, do not remove, cut, deface, injure, or destroy existing vegetation.

b. Protect vegetation, that is to remain, from damage by construction operations.

c. Vegetation, intended to remain, that is scarred or damaged by construction operations shall be removed and replaced with equivalent undamaged vegetation.

d. Removal of scarred or damaged vegetation shall be in accordance with the specifications.

e. Trees or shrubs with 30 percent or more of their root systems damaged shall require removal and replacement.

f. Replacement vegetation shall be approved by the Engineer before replacement.

3. Water Resources:

a. Prevent oily or hazardous substances from entering the ground, drainage areas, or local bodies of water.

b. Provide secondary containment of temporary fuel oil, petroleum, or hazardous substance storage tanks of sufficient size and strength to contain the contents of the tanks.

c. Cover and protection from vandalism will be provided at the Site for petroleum products or other materials that have the potential to pose a threat to human health or the environment.

d. Pumps located within 100 feet of waters of the U.S. will be on an impervious surface or plastic liner with absorbents capable of containing leakage of petroleum products.

e. Equipment to be used adjacent to waters of the U.S. shall be equipped with environmentally friendly (i.e., vegetable based) hydraulic fluids.

4. Fish and Wildlife Resources:

a. Do not alter or significantly disturb water flows on or adjacent to the project Site, except as indicated or specified.

b. Do not alter or significantly disturb native habitat on or adjacent to the project Site, except as indicated or specified.

c. Conformance with supplementary permit conditions, as applicable.

N. Noise, Vibration, Vapor, Odor, and Dust Control:

1. Conduct operations in compliance with applicable local noise ordinance.

2. Vapor, odor, and dust shall be controlled in compliance with the approved Contractor's Health and Safety Plan (CHASP) and site-specific Community Air Monitoring Plan (CAMP).

3. Equip compressors, hoists, and other apparatus with such mechanical devices as may be necessary to minimize noise, vibration, and dust. Equip compressors with silencers on intake lines.

4. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.

5. Provide unpaved roads, detours, or haul roads used in construction areas with water treatment to minimize dust. No visible dust, as determined by the Engineer, will be permitted beyond the limits of the exclusion zone.

6. Provide sound barriers needed to meet the requirements of these specifications.

7. Control noise levels associated with Site operations in accordance with local noise ordinances.

8. Measure noise levels in decibels with a sound level meter conforming to the American National Standard Specification. ANSI 12.9-2005/ Part 4

9. Measurements shall be made at Site perimeter.

10. Measurements shall be continuous during the first week of construction activities. Additional measurements may be directed by the Engineer throughout the course of the project.

11. Measurements shall be documented and reported to the Engineer.

12. If the noise levels are not maintained in compliance with federal, state, and local noise ordinances, take appropriate measures to bring the noise under control at no additional cost to the Owner.

13. Additional specific requirements are given in Specification Section 01110 – Environmental Protection Procedures.

1.3 REFERENCES

A. 29 CFR 1910.210 Hazardous Waste Operations

B. American National Standards Institute (ANSI) 12.9-2005/Part 4

C. National Electrical Contractors Association (NECA)

D. National Electrical Manufacturers Association (NEMA)

E. National Fire Protection Association (NFPA) 10 Standard for Portable Fire Extinguishers (2022 or most recent version)

F. NFPA 241, Standard for Safeguarding Construction, Alternation, and Demolition Operations (2022 or most recent version)

G. New York State Department of Environmental Conservation Standards and Specifications for Erosion and Sediment Control (November 2016 or most recent version)

H. NYSDEC DER-10

I. New York City Department of Environmental Protection

J. New York State Department of Health (NYSDOH) Laws and Regulations

K. Underwriters Laboratories (UL) Standards

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for temporary utilities and temporary facilities may be new or used but shall be adequate for purposes intended and shall not create unsafe conditions and shall comply with Laws and Regulations.

B. Provide required materials, equipment, and facilities, including piping, cabling, controls, and appurtenances.

C. Provide equipment to perform the activities associated with temporary environmental controls including, but not limited to:

1. Pumps, hoses, and other water handling equipment used for dust control;
2. Water truck(s) or other equipment needed to provide dust suppression independent of moisture conditioning activities; and
3. Equipment for deploying environmental controls.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install temporary utilities and temporary facilities in neat, orderly manner, and make structurally, mechanically, and electrically sound throughout.

B. Location of Temporary Utilities and Temporary Facilities:

1. Locate temporary systems for proper function and service.
2. Temporary systems shall not interfere with or provide hazards or nuisances to: the Work under this and other contracts, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, or work of utility owners and others.

3. Do not install temporary utilities on the ground, with the exception of temporary extension cords, hoses, and similar systems in place for short durations.

C. Modify and extend temporary systems as required by progress of the Work.

3.2 USE

A. Maintain temporary systems to provide safe, continuous service as required.

B. Properly supervise operation of temporary systems:

1. Enforce compliance with Laws and Regulations
2. Enforce safe practices
3. Prevent abuse of services
4. Prevent nuisances and hazards caused by temporary systems and their use
5. Prevent damage to finishes
6. Ensure that temporary systems and equipment do not interrupt continuous progress of construction

C. At end of each workday check temporary systems and verify that sufficient consumables are available to maintain operation until work is resumed at the Site. Provide additional consumables if the supply on hand is insufficient.

3.3 REMOVAL

A. Completely remove temporary utilities, temporary facilities, equipment, and materials when no longer required. Repair damage caused by temporary systems and their removal and restore the Site to condition required by the Contract Documents; if restoration of damaged areas is not specified, restore to preconstruction condition.

B. Where temporary utilities are disconnected from existing utility, provide suitable, watertight, or gastight (as applicable) cap or blind flange, as applicable, on service line, in accordance with requirements of utility owner.

C. Where permanent utilities and systems were used for temporary utilities, upon Substantial Completion replace consumables such as filters and light bulbs and parts used during the Work.

*** END OF SECTION 01510 ***

SECTION 01521

TEMPORARY FIELD OFFICES AND STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. This Section includes requirements for Contractor provided field offices, with furnishings, equipment, and consumables, for use by Owner, Engineer, Contractor and NYSDEC.
2. Provide and maintain field office for Owner's sole use.
3. Provide and maintain field office for Engineer's sole use.
4. Provide field office at location approved by Owner and Engineer, near Contractor's field office.
5. Field office shall be complete and fully functional within 10 days after date on which the Notice To Proeed is issued or within approved mobilization date unless the schedule is otherwise modified in accordance with the Special Conditions.
6. Obtain required permits for field offices, as applicable.

1.2 SUBMITTALS

A. Action Submittals: Obtain Engineer's approval of the following prior to staging field office to the Site:

1. Field Office Submittal: Submit the following under one submittal cover:
   a. Site plan indicating proposed location of field offices, parking for field offices, facilities related to the field offices, and material of both field office parking and sidewalk or walkway to field office.
   b. Information on proposed field office size, construction, exterior appearance, interior finishes, and field office security measures.
   c. Proposed layout of field office interior, showing location of offices, common areas, restroom, closet, other areas specified (if any), with dimensions indicated for each.
   d. Proposed layout of field office exterior identifying sign, showing text, font, colors, and graphics (if any).
   e. Proposed type of Internet service; name of proposed Internet service provider; and product data and technical information on equipment (if any) required for Internet service.
   f. Office Equipment: Product data and technical information for copier, telephones, and other office equipment.

PART 2 – PRODUCTS

2.1 FIELD OFFICE CONSTRUCTION AND SITE REQUIREMENTS

A. Site at Field Office:

1. Provide four reserved parking spaces for use by Owner and Engineer in close proximity to field offices. Parking area shall be paved with crushed stone or other material approved by Engineer. Parking area shall be suitably drained and free of standing water during wet weather.

B. Three (3) Field Offices:

1. Structurally sound foundation and superstructure.
2. Skirting.
3. Shall have a floor area of not less than 460 square feet, and not less than 10 feet wide.
4. Completely weather-tight and insulated, with minimum R-19 insulation.
5. Exterior finish approved by Engineer.
6. New interior finishes approved by Engineer, including resilient floor covering in good condition.
7. Field Office Ingress and Egress:
   a. Two doors for ingress and egress for the Engineer and Contractor trailers, each with landing, stairs, and railing complying with building codes and other Laws and Regulations in effect at the Site.
   b. Landing and stairs shall have slip-resistant walking surfaces, and be metal, pressure-treated wood, fiberglass, or concrete.
   c. Railing shall be metal, wood, or fiberglass.
   d. Door Security:
      1) Doors shall be secure and lockable.
      2) Furnish each door with suitable, lockable security bar or knob.
8. Windows:
   a. Window area equal to not less than 10 percent of floor area.
   b. Windows shall each have insect screen and operable sash.
   c. Provide each window with lock and exterior security bars approved by Engineer.
9. One lockable closet for storage.
10. Keys:
    a. Furnish to Engineer two identical sets of keys suitable for operating keyed locks, including ingress/egress door locks, security bars for doors, window locks, closets, and office furnishings.
    b. Permanently label each key to indicate its associated lock.
11. Restroom:
    a. Provide separate in-trailer sanitary facilities for males and females including one lavatory, one toilet, and soap dispenser.

12. Exterior Sign:

a. Field office identifying exterior sign, approved by Engineer. Sign shall be durable, weatherproof, and suitable for long-term exposure to sunlight.

b. Exterior sign shall be not less than 1.5 feet high by 4 feet wide, installed at location determined in field and acceptable to Engineer.

c. Sign shall be in color.

d. Sign layout and general proportions shall be furnished by Engineer as a JPG file graphic for use by Contractor in preparing the sign.

C. Field Office Construction:

1. Provide mobile office trailer in first-class condition approved by Engineer, specifically designed for use as construction field office and complying with requirements of this Section.

2. Provide skirting around perimeter of each mobile field office trailer.

3. Supplier: Provide field office by one of the following:

a. Pac-Van, Inc.

b. Modular Space Corporation (ModSpace)

c. Mobile Mini Solutions/Williams Scotsman, Inc.

d. Or equal

2.2 FIELD OFFICE UTILITIES

A. Comply with Specification Section 01510 - Temporary Utilities and Controls.

B. Provide the following for the Owners and Engineer's field office trailers:

1. Electrical:

a. Provide continuous, temporary electrical service for temporary field offices and sheds. Provide temporary outlets with circuit breaker protection and ground fault protection.

b. Provide written plan for electrical service including approved service requests and work orders, as applicable.

c. Provide materials that comply with applicable NEMA, NECA, and UL standards and governing regulations of temporary electrical services.

d. Provide temporary lighting for Engineer's field office.

2. Internet Access:

a. Obtain and pay for Internet service until removal of the field office, with unlimited (untimed) Internet access, for Engineer's sole use.

b. Set up system and appurtenances required and verify functionality in the field office.

c. Internet service shall be one of the following, listed in order of preference; provide a lower type of access only when the next-higher level is unavailable:

1) Fiber-optic or Cable Provider Service:

a) Provide service via communication service provider via either cable or fiber-optic service at download speed of not less than 15 megabytes per second (Mbps) and upload speed of not less than 1 Mbps.

b) Provide appropriate modem, cabling, and appurtenances.

2) DSL:

a) Provide service via symmetrical digital subscriber line with download speed of not less than 1.5 Mbps and upload speed of not less than 384 kilobits per second (Kbps).

b) Provide dedicated telephone line for Internet access.

c) Provide DSL filters on each non-DSL outlet in the field office telephone system.

3) Mobile Broadband Wireless:

a) Provide mobile broadband wireless 4G network by AT&T, Verizon, Sprint, T-Mobile, or equal, with download speed of not less than 37 Mbps and upload speed of not less than 17 Mbps.

b) Provide mobile broadband wireless router. Product and Manufacturer: Linksys Wireless-G Router for Mobile Broadband, or equal.

c) Mobile broadband air-card for field office. Product and Manufacturer: Sierra Wireless 597E, Novatel Merlin EX720, or equal.

d) Router and air-card will remain Contractor's property upon removal of field office from the Site.

4) Satellite:

a) Provide 4G network service with download speed of not less than 12 Mbps.

b) Provide required equipment, including outdoor unit (dish) and indoor satellite modem equipment, together with required cabling.

c) Provide telephone modem in computer, together with telephone line and service, for file uploading.

3. Heating, Ventilation and Air Condiitoning:

a. Provide temporary heating, ventilating, and cooling for the Engineer's field office, breakroom(s) and meeting areas between 65°F and 80°F with relative humidity less than 75 percent.

4. Water:

a. Provide temporary potable water for the Engineer's field office n accordance with New York State Department of Health (NYSDOH) Laws and

Regulations for consumption by personnel at the Site, for field offices, and for sanitary facilities.

C. Should actions of utility companies delay the complete set up of field office, Contractor shall provide temporary electricity, heat, water supply, sanitary facilities, and telephone service as required at no additional cost to Owner.

2.3 FURNISHINGS AND EQUIPMENT (THREE TRAILERS)

A. Three field office trailers (i.e., one for Owner, one for Engineer, and one for NYSDEC). Contractor's field trailer to be equipped consistent with other office trailers on Site and will include an internal meeting space sufficient for a minimum of 10 people. Provide the following furnishings and equipment:

1. Desks: Two 5-drawer desks, each with desktop surface five feet long by 2.5 feet wide with not less than one file drawer per desk, suitable for storing 8.5-inch by 11-inch documents.
2. Desk Chairs: Two new or used (in good condition) five-point, high backed, cushioned swivel chairs with seat-height adjustment.
3. Other Chairs: Four side chairs with arm rests and padded seats and backs, and eight metal folding chairs without arm rests.
4. Two new or used (in good condition) folding tables each eight feet long by 2.5 feet wide.
5. Two new or used (in good condition) folding tables each four feet long by 2.5 feet wide.
6. Plan rack(s) to hold not less than eight sets of the Construction Drawings.
7. Two 4-drawer file cabinets.
8. One 2-door storage cabinet.
9. Shelving or bookcase with a total of 12 feet of shelf length and not less than 12 inches deep.
10. Four polyethylene waste baskets, each with capacity of not less than seven gallons.
11. Suitable doormat at each exterior ingress/egress door.
12. Two cork tack-boards, each 2.5 feet by 3 feet, with thumbtacks.
13. One white board for use with dry markers, approximately 6 feet by 4 feet, with marker holding tray, installed by Contractor at location directed by Engineer in the field office. Furnish supply of colored markers and eraser for the white board.
14. Owners field office to include the following:
    a. Work spaces at each end of the trailer.
    b. Central space meeting space sufficient for a minimum of 10 people.
    c. Plan rack and layout table.
15. Safety Equipment: Provide the following:
    a. Fire extinguishers with associated signage.

b. Smoke detector with supply of batteries.

c. Carbon monoxide detector with power supply.

d. Provide in accordance with Laws and Regulations. For each field office structure, provide not less than two wall-mounted fire extinguishers, one battery-operated ceiling-mounted smoke detector, and one carbon monoxide detector suitably installed.

16. First-Aid Station:

a. In addition to first-aid stations otherwise required by the Contract Documents, provide for Engineer's sole use a first-aid station in Engineer's field office.

b. Product and Manufacturer: Zee Medical USA, Item 0152, "Medium Four-Shelf Plastic Cabinet", www.zeemedical.com; or equal.

17. Personal Protective Equipment (PPE) for Visitors. Furnish the following:

a. Protective Helmets (Hard Hats): Four, each with full brim, of fiberglass or thermoplastic; each with ratchet suspension; white in color.

b. Safety Glasses: Four, each with clear lenses, polycarbonate, anti-fog and anti-scratch coating, suitable to fit over personal eyewear.

c. Reflective Safety Vest: Four, each of polyester mesh or other material acceptable to Engineer, color to be high-visibility orange, with one- inch-wide reflective tape, one-size-fits-all design.

d. Earplugs: Supply of foam, disposable earplugs. Promptly resupply when stock is depleted.

18. Two electric clocks.

19. One electric coffee maker, with 10-cup capacity or larger.

20. Bottled water with electric cooler dispenser for 5-gallon bottles, with cup dispenser.

21. Telephone System:

a. Telephone System Features:

1) Provide one cordless telephone with hands-free speaker.

i. Mobile phones may be substituted with Engineer approval.

22. Multi-function Copier:

a. One new or used (in good condition) machine with the following functions: photocopying, network printing, scanning to produce PDF and JPG files, and e-mail.

b. Products and Manufacturers. Provide one of the following:

1) Xerox WorkCentre 5845.

2) Or equal.

c. Minimum Memory: 2 GB.

d. Ten-bin sort capacity, 8.5-inch by 11-inch, 8.5-inch by 14-inch, and 11-

inch by 17-inch paper capacity, enlarging and reducing capabilities, stream-feed capability, bypass feeder, stapling capability, and double-sided copying capability. Copier shall produce not less than 40 copies per minute.

e. Provide necessary cables and appurtenances to enable the functions specified in this Section, including scan-and-email and printing from field office computers. Furnish services of manufacturer's representative to set up and service copier.

23. Kitchen Area Appliances: Provide the following in the field office kitchen area:

a. One new, frost-free, refrigerator-freezer, with capacity of not less than six cubic feet.

b. One new microwave oven, not less than 1.2 cubic foot size.

c. Kitchen area appliances will remain property of Contractor upon removal of field office.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install field office and related facilities in accordance with Laws and Regulations.

B. Install materials and equipment, including prefabricated structures, in accordance with manufacturer's instructions, and to provide optimal performance and accuracy.

3.2 CLEANING, MAINTENANCE, AND SUPPLIES

A. Furnish the following maintenance services:

1. Immediately repair malfunctioning, damaged, leaking, or defective field office structure, site improvements, systems, and equipment.

2. Provide computer supplies and pay for maintenance on Contractor furnished computer system and copier.

3. Promptly provide snow and ice removal for field offices, including parking area, walkways, and stairs and landings.

4. Provide continuous maintenance and janitorial service of field offices and sanitary facilities. Clean field office not less than once per week. Sweep or vacuum field office not less than daily, or more-frequently when site conditions are such that dirt or mud is frequently tracked into field office. Clean and wax (as appropriate) flooring every six months.

5. Waste Disposal:

a. Properly dispose of trash and waste as needed, not less than twice per week.

b. Properly handle and dispose of recyclables. Disposal of recyclables as trash.

c. Dispose of other waste, if any, as required, to avoid creation of nuisances and adverse environmental effects. Properly dispose of electronic waste, when necessary, at proper waste receiving facility.

B. Consumables: Provide the following consumables as needed:

1. Toner and ink cartridges for printers and copier, as required.
2. Paper supplies for printer and copier. Always maintain in field offices not less than one ream of each size of paper for which printer and copier are capable.
3. Dry markers in six colors and white board eraser set. Replace markers when exhausted or lost.
4. Bottled water suitable for water dispenser and disposable cups.
5. Coffee supplies, including coffee, filters, cups, sugar, creamer, and stir-sticks.
6. Hand-soap, paper towels, toilet paper, cleansers, and janitorial implements, including broom.
7. Furnish batteries for smoke detector and other battery-powered items.
8. Replace fire extinguishers upon expiration.
9. Not less-often than monthly, inspect first-aid kit and inventory items consumed or used and remove items that are at or near their expiration date. Promptly replace and restock consumed and expired items.

3.3 REMOVAL

A. Remove field office and furnishings when directed by Engineer, prior to inspection for final completion. Deliver specified equipment to Owner.

*** END OF SECTION 01521 ***

SECTION 01721

PROTECTION OF WORK AND PROPERTY

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes general requirements governing execution of the Work by the Contractor as specified in the Contract Documents to include the protection, relocation, and decommissioning of existing and installed construction including, but not limited to, utilities, pipes, catch basins, filters, manholes, above ground structures, and retaining walls.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PROTECTION OF EXISTING UTILITIES AND INSTALLED CONSTRUCTION

A. Coordinate construction and operations of the Work with the Engineer.

B. Conduct pre- and post-construction surveys and associated monitoring of adjacent structures in accordance with the requirements of Specification Section 13091 – Structural Monitoring.

C. Sustain and protect from direct or indirect injury any and all utilities, structures and property within the limits of work, whether above ground or underground, or which appear within trenches or excavations, as stated herein, with the exception of those scheduled for full removal and newly furnished or replaced structures (e.g., storm sewers, catch basins, etc.) as described or shown in the Contract Documents. Assume all expenses for direct or indirect damage which may be occasioned by injury to any of the aforementioned at no additional cost to the Owner.

D. At a minimum, perform hand/vacuum excavation for all intrusive activities, as described in this Section.

1. Obtain all necessary permits for excavation prior to commencing intrusive activities.

2. Call New York 811 and follow NYS Code 753 prior to commencing intrusive activities.

3. Thoroughly review all information relevant to the location of utilities, including Construction Drawings, Con Edison record drawings, utility locations in the field visible from the surface and subsurface utility location mark outs.

4. Contractor shall perform subsurface utility location survey of the area intended for intrusive activities prior to the start of intrusive ground disturbance activities.

5. The Contractor's surveyor shall record the positions of the subsurface utility location mark outs, including the estimated depths to utilities, if available.

6. Compare and reconcile the subsurface utility mark outs with the utility locations shown on the Construction Drawings and the Con Edison record drawings. Notify the Engineer of any discrepancies. Submit the surveyed utility mark out location data to the Engineer in CADD format within two (2) work days.

7. Re-assess the planned intrusive work based on any new information obtained from the subsurface utility survey and notify the Engineer of any deviations required from the approved Construction Plan.

8. Hand/vacuum excavate soil in accordance with Owner requirements, at a minimum as described below:

    a. At all suspected subsurface utility locations to a depth that either locates the utility or extends a minimum of 1 foot below the depth of the proposed intrusive work.

    b. Along all proposed trench centerlines to the depth of the proposed intrusive work.

    c. At all locations where excavation support systems will be installed, clear soil to 4 - 6 inches below the bottom of the concrete/asphalt or the depth of the deepest suspected (unlocated) utility within 30 feet, whichever is deeper.

    d. Decontamination of the vacuum truck or vacuum unit shall be at the expense of the Contractor. Decontamination will be performed prior to leaving the site.

E. Protect any and all adjacent structures and property not scheduled for demolition from damage including, but not limited to, on-site and off-site structures, utilities, roadways.

F. Repair and restore to the satisfaction of the Engineer any and all existing facilities, structures, equipment, surfaces, finishes or other features, which may become damaged or disturbed as a result of the Work or activity of the Contractor or Subcontractor personnel, at no additional cost to the Owner.

G. Do not load, undermine, or permit any part of any existing structure or installed construction to be loaded or undermined in any manner that will endanger the integrity of the structure.

*** END OF SECTION 01721 ***

SECTION 01732

SELECTIVE DEMOLITION

PART 1 – GENERAL

1.1 SUMMARY

A. This section describes Work required to demolish or alter structures as part of the remediation activities to be conducted at the Site. Unless otherwise specified, the Contractor will be responsible for the following demolition and alteration activities, as outlined below.

1. All subsurface and above ground utilities within the excavation/ISS areas will be removed or relocated.
2. Protect and maintain all subsurface and above-ground utilities within the work zones that are not impacted by excavation/ISS.
3. All other surface and subsurface concrete structures and slabs, metal piping, and other structures encountered during implementation of the Work shall be demolished and/or removed as specified in this Section or as indicated on Contract Drawings.
4. Identification of other structures, utilities, pavement, or site features that require removal in order for the Work to be completed as required by the Contract Documents shall be brought to the attention of the Engineer.
5. All buildings and other structures not specifically identified for demolition (on-site and on adjacent properties) shall be protected from damage and shall be repaired and restored if damaged during construction in accordance with this Section and Specification Section 01721 – Protection of Work and Property.
6. Notify the Engineer immediately if unknown utilities are identified in the work area, or if any damage to existing utilities occurs. Above ground and underground utilities encountered during implementation of the work shall be relocated or removed at the direction of Con Edison.

B. The approximate locations and dimensions of structures to be removed are indicated on the Construction Drawings. The Contractor may encounter former foundations and piping, utilities, wooden or other piling, and other debris during excavation and ISS activities. If the Contractor encounters a structure not shown on the Construction Drawings, notify the Engineer immediately.

C. Surface structure removal work shall be performed in a manner that does not disturb or damage existing utilities, roadways, or other facilities not indicated to be removed.

1.2 RELATED SECTIONS

A. Section 01721 – Protection of Work and Property

B. Section 02120 – Off-Site Transport and Disposal

C. Section 02125 – Decontamination

D. Section 02145 – Water Treatment and Disposal

1.3 REFERENCES

A. Title 29 CFR Part 1910 and Title 29 CFR Part 1926 Subpart T – Demolition.

B. New York City Administrative Code Title 24 Chapter 1: Air Pollution Control

C. New York City Department of Buildings (NYCDOB) 2022 Building Code Chapter 33 – Safeguards During Construction or Demolition

D. New York City Fire Code Chapter 33 – Fire Safety During Construction, Alteration and Demolition

E. Rules of the City of New York (RCNY) Title 15 Chapter 1: Asbestos Control Program

1.4 DEMOLITION REQUIREMENTS

A. Check structural condition of any adjacent structure where employees may be exposed.

B. Comply with all applicable regulations for demolition work, including Title 29 CFR Part 1910 and Title 29 CFR Part 1926 Subpart T – Demolition.

1.5 HAZARDOUS MATERIALS (IF REQUIRED)

A. Demolition or alteration of any subsurface structure or utility identified as containing ACM or hazardous materials shall be performed by the Contractor in accordance with the relevant Con Edison guidance documents and Technical Specifications. Any hazardous materials generated during demolition will be disposed of by the Contractor with an appropriate waste profile.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PREPARATION

A. Erect and maintain barriers around structures designated not to be demolished and provide other necessary safety measures as required by regulations.

B. Locate and protect nearby utilities, fences, and all other items that are not designated to be demolished.

C. Remove water encountered from intact subsurface structures before demolition.

D. Dewater excavations for removal of subsurface structures and foundations as specified in Specification Section 02145 – Water Treatment and Disposal.

3.2 REMOVAL OF STRUCTURES

A. When removing concrete or masonry, the materials shall be saw-cut at the limits of removal to assure a smooth, uniform joint with the remaining materials.

B. No wrecking balls, blasting, or cables shall be permitted.

C. Non-Hazardous materials generated during demolition shall be temporarily stockpiled, sized, segregated, transported and disposed at an Owner-approved waste management facility as specified in Specification Section 02120 – Off-Site Transport and Disposal.

D. Demolition debris shall be inspected following removal. If any site soils, staining, or nonaqueous phase liquid (NAPL) materials are observed on the debris, the debris will be decontaminated, if possible, or stockpiled with the contaminated soils characterized for off-site disposal.

E. Unless specified otherwise, structures shall be completely removed below the ground surface.

F. Demolish concrete and masonry structures as follows:

1. Break up large pieces of concrete as required for off-site disposal facilities.
2. Decontaminate materials as specified in this Section if required.
3. Load and transport materials into trucks for transport to an Owner-approved waste management facility.
4. Reuse demolition materials on-site if approved by Owner and/or Engineer.

G. Demolish steel as follows:

1. If piping and rebar are encountered, cut piping and other steel materials into manageable pieces for off-site transportation and disposal.
2. Load cut pieces into trucks for transportation to an Owner-approved waste management facility.

3.3 DECONTAMINATION OF DEBRIS

A. All debris that is visually contaminated must be decontaminated in accordance with Specification Section 02125 - Decontamination.

B. Inspect debris for soil, sludge, fluids, or NAPL. Any loose material should be dry brushed off the debris or power washed.

C. Any solid residue from decontamination must be collected and disposed with contaminated soils.

D. Decontamination of the debris must meet the acceptance criteria of the disposal facility, and at a minimum all loose material must be removed, and no visual staining is observed.

E. Decontaminated debris may be re-used on-site if approved by Owner and/or Engineer.

*** END OF SECTION 01732 ***

SECTION 01783

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SCOPE

A. Scope:

1. Maintain and submit to the Engineer record documents in accordance with this Section.

1.2 SUBMITTALS

A. Closeout Submittals:

1. Record Documents: Submit in accordance with Article 1.04 of this Section.

1.3 MAINTENANCE OF RECORD DOCUMENTS

A. Maintain in the Contractor's field office, in clean, dry, legible condition, complete sets of project record documents. Project record documents include but are not limited to, the following:

1. Remedial Design Report, Construction Drawings, Technical Specifications, and Addenda.
2. Shop Drawings, Samples, and other Contractor submittals, including records of test results, reviewed or accepted by the Engineer, as applicable.
3. Change Orders, Work Change Directives, Field Orders, photographic documentation, survey data, and all other documents pertinent to the Work.
4. The Contractor's updated work schedule.
5. As-built survey drawings.
6. Meeting minutes.
7. Permits.
8. Shipping papers (e.g., waste manifest and bills of lading).
9. The Contractor's Health and Safety Plan (HASP), including appropriate training/medical monitoring certifications, Site and emergency contact information, and emergency route(s) to hospital.

B. Provide files and racks for proper storage and easy access to record documents. File record documents in accordance with the edition of the Construction Specification Institute's "MasterFormat" used for organizing the Project Manual, unless otherwise accepted by the Engineer.

C. Make record documents available for inspection upon request of the Owner or Engineer.

D. Do not use record documents for purpose other than serving as Project record. Do not remove record documents from the Contractor's field office without the Engineer's approval.

1.4 SUBMITTAL OF RECORD DOCUMENTS

A. Prior to readiness for final payment, submit to the Engineer one copy of the following record documents:

1. Construction Drawings.
2. Technical Specifications.
3. Addenda.

B. Submit record documents with transmittal letter on the Contractor's letterhead complying with letter of transmittal requirements in Specification Section 01350 – Document Submittal Procedure.

C. Record documents submittal shall include certification, with original signature of an official authorized to execute legal agreements on behalf of the Contractor, reading as follows: "[*Insert Contractor's corporate name*] has maintained and submitted record documentation in accordance with Specification Section 01783 – Project Record Documents and other elements of Contract Documents, for the Con Edison, West 45th Street Former MGP Site, New York, New York. We certify that each record document submitted is complete, accurate, and legible relative to the Work performed under our Contract, and that the record documents comply with the requirements of the Contract Documents.

[*Provide signature, print name, print signing party's corporate title, and date*]"

1.5 RECORDING CHANGES

A. General:

1. At the start of the Project, label each record document to be submitted as "PROJECT RECORD" using legible, printed letters. Letters on record copy of the Construction Drawings shall be two inches high.
2. Keep record documents current. Make entries on record documents within two (2) working days of receipt of information required to record the change.
3. Do not permanently conceal the Work until required information has been recorded.
4. Accuracy of record documents shall be such that future searches for items shown on the record documents may rely reasonably on information obtained from the Engineer-accepted record documents, as applicable.
5. Marking of Entries:
    a. Use erasable, colored pencils (not ink or indelible pencil) for marking changes, revisions, additions, and deletions to record documents.
    b. Clearly describe the change by graphic line and make notations as required. Use straight edge to mark straight lines. Writing shall be legible and sufficiently dark to allow scanning of record documents into legible electronic files.
    c. Date all entries on record documents.
    d. Call attention to changes by drawing a "cloud" around the change(s) indicated.

e. Mark initial revisions in red. In the event of overlapping changes, use different colors for subsequent changes.

B. Construction Drawings:

1. Record changes on a copy of the Construction Drawings. Submittal of the Contractor-originated or -produced drawings as a substitute for recording changes on the Drawings is unacceptable.

2. Record changes on plans, sections, schematics, and details as required for clarity, marking reference dimensions and elevations (to Project datum) for complete record documentation.

3. Record actual construction, including:

a. Horizontal and vertical location of existing Underground Facilities and surface structures demolished, realigned, or abandoned in-place, referenced to permanent surface improvements. For each Underground Facility or surface structure, provide dimensions to at least two permanent, visible surface improvements.

b. Horizontal and vertical limits of excavation.

c. Depths of various elements of backfill/restoration relative to Project datum.

d. Location of exposed utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Site.

e. Changes in structural and architectural elements of the Work, including changes in reinforcing.

f. Field changes of dimensions, arrangements, and details.

g. Changes made in accordance with Change Orders, Work Change Directives, and Field Orders.

h. Changes in details on the Construction Drawings. Submit additional details prepared by the Contractor when required to document changes.

4. Supplemental Drawings:

a. In some cases, drawings produced during construction by the Engineer or Contractor supplement the Construction Drawings and shall be included with record documents submitted by the Contractor. Supplemental record drawings shall include the following:

1) Drawings provided with Change Orders, Work Change Directives, and Field Orders.

2) Drawings that cannot be incorporated into the Drawings due to space limitations.

3) Certified survey drawings, in accordance with Article 1.6 of this Section.

b. Supplemental drawings provided with record drawings shall be integrated with the Construction Drawings and include necessary cross-references between drawings. Supplemental record drawings shall be on sheets the same size as the Construction Drawings.

c. When supplemental drawings developed by the Contractor using computer- aided drafting/design (CADD) software are to be included in record drawings, submit electronic files for such drawings in AutoCAD 2018, or newer, format as part of record drawing submittal. Submit electronic files electronically labeled, "Supplemental Record Drawings", together with the Contractor's name, Project name, and Contract name and number.

C. Technical Specifications and Addenda:

1. Mark each Section to record:

a. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually provided.

b. Changes made by Addendum, Change Orders, Work Change Directives, and Field Orders.

1.6 CERTIFIED SURVEY DRAWINGS

A. Prepare the following survey drawings:

1. Pre-Construction Survey, depicting the pre-construction horizontal and vertical limits for the site, including the subareas, utilities, and structures (on Site and adjacent) as shown on the Construction Drawings, including spot elevations and topographic contours.

2. Interim Survey(s), depicting the installation of any support components, including alignment and spot elevations.

3. Post-Excavation Survey, depicting the horizontal and vertical limits of material removal from the site including spot elevations and topographic contours.

4. ISS Survey, depicting the horizontal and vertical limits of the ISS activities completed.

5. Final As-Built Survey, depicting the final grades and surface conditions for the site, including the subareas, as shown on the Construction Drawings, including spot elevations and topographic contours.

B. Drawing Requirements:

1. General Content:

a. Property lines, easements, and rights-of-way.

b. Topographic contours at minimum 1-foot intervals.

c. Horizontal and vertical location of buildings, foundations, bridges, and walls.

d. Horizontal location of exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, fencing, gates, guard rails, guard cables, and other facilities visible at or above ground surface.

e. Horizontal limits of lawns, pavements, roads, walks, drives, and other surface improvements.

f. Horizontal and vertical location of monitoring wells, including ground surface elevation, outer casing elevation, and inner casing elevation.

g. Horizontal location, size (diameter), and species of trees and other plantings.

2. Scale: 1-inch equals 30 feet.

3. Sheet Size: 42 inches wide by 30 inches high.

C. Certification:

1. Each survey drawing shall be signed and sealed by a Professional Land Surveyor licensed and registered in the State of New York.

1.7 ELECTRONIC FILES FURNISHED BY ENGINEER

A. CADD files will be furnished by the Engineer upon the following conditions:

1. The Contractor shall submit to the Engineer a letter on the Contractor's letterhead requesting CADD files and providing specific definition(s) or description(s) of how files will be used, and specific description of benefits to the Owner if the request is granted.

2. The Contractor shall execute the Engineer's standard agreement for release of electronic files and shall abide by all provisions of the agreement for release of electronic files.

3. Layering system incorporated in CADD files shall be maintained as transmitted by the Engineer. CADD files transmitted by the Engineer containing cross-referenced files shall not be bound by the Contractor. Drawing cross-references and paths shall be maintained. If the Contractor alters layers or cross-reference files, the Contractor shall restore all layers and cross-references prior to submitting record documents to the Engineer.

4. Submit record drawings to the Engineer in same CADD format that files were furnished to the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

*** END OF SECTION 01783 ***

SECTION 02120

OFF-SITE TRANSPORT AND DISPOSAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes the requirements for managing and handling, transport, and disposal of excavated materials and debris.

1.2 SUMMARY

A. Ensure vehicles are properly loaded; check vehicle contents are properly contained and secured in the vehicle including proper impervious lining and covering of loads. Abide by all load limits and weight limits for all vehicles leaving the site, pay any fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles.

B. Coordinate waste shipments with the disposal facilities. Con Edison shall be notified on a daily basis of the anticipated shipping volume and the destination facility.

C. Perform the Work in accordance with related Sections of this specification and the following Con Edison specifications including all required waste characterization, submittals, documentation and permits:

1. ES-053A, Con Edison Environmental Specification for Disposal of Non-Hazardous Solid Waste
2. ES-063 Con Edison Environmental Specification for the Management of Characteristic and Listed Hazardous Wastes
3. ES – 035A Disposal of Non-Hazardous Solid Waste

1.3 REFERENCES

A. Perform all Work in accordance with applicable, federal, state, and local regulations and guidance documents.

B. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

1. Applicable U.S. Department of Transportation (DOT) Regulations
    a. DOT 4500.9R- Defense Transportation Regulation, Part 2, Cargo Movement, Chapter 204, Hazardous Material
    b. DOT Hazardous Materials Security Plan
2. Applicable U.S. Environmental Protection Agency (EPA) and DOT Regulations
    a. 40 CFR 261 - Identification and Listing of Hazardous Waste

b. 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste

c. 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste

d. 40 CFR 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

e. 40 CFR 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

f. 40 CFR 266 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities

g. 40 CFR 268 - Land Disposal Restrictions

h. 40 CFR 270 - EPA Administered Permit Programs: The Hazardous Waste Permit Program

i. 40 CFR 279 - Standards for the Management of Used Oil

j. 40 CFR 300 - National Oil and Hazardous Substances Pollution Contingency Plan

k. 40 CFR 302 - Designation, Reportable Quantities, and Notification

l. 40 CFR 61 - National Emission Standards for Hazardous Air Pollutants

m. 49 CFR 107 - Hazardous Materials Program Procedures

n. 49 CFR 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

o. 49 CFR 173 - Shippers - General Requirements for Shipments and Packaging

p. 49 CFR 178 - Specifications for Packaging

3. Applicable New York State Department of Environmental Conservation (NYSDEC) Regulations

a. Technical Guidance for Site Investigation and Remediation (DER-10)

1.4 DEFINITIONS

A. Hazardous Material

1. A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C. Appendix Section 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.

B. Hazardous Waste

1. A waste which meets criteria established in the Resource Conservation and Recovery Act (RCRA) or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a New York state program.

C. Non-Hazardous Waste

1. A non-RCRA hazardous waste, that is subject to certain management requirements including waste generated from processes associated with the production of goods and products, such as electric power generation and manufacturing of materials such as pulp and paper, iron and steel, glass and concrete.

D. Construction and Demolition (C&D) Debris

1. An uncontaminated solid waste resulting from the construction, remodeling, repair and demolition of utilities, structures and roads; and uncontaminated solid waste resulting from land clearing.

1.5 SUBMITTALS

A. Submit a Material Handling Plan as part of the Construction Plan detailing the procedures, materials and equipment to be used for the excavation, dewatering, relocation, transportation, consolidation, disposal of waste materials and stockpiling and contingency planning. Material handling work shall not begin until the Engineer has reviewed this submittal.

B. Submit a Waste Management Plan as part of the Construction Plan describing means and methods for managing material after removal and arranging for transportation of generated waste to the off-site processing and disposal facility(ies). At a minimum, include the following:

1. Description, number, and type of trucks to be used for material transport, including debris, from the removal areas to the upland support/staging areas.
2. Locations of identified TSDFs and reclamation/recycling/salvage facilities.
3. Name, location, and a copy of the operating permit for off-site disposal facilities to be used.
4. Waste profiles and acceptance letters from each disposal facility.
5. The proposed haul route over local roads to each of the identified facilities.
6. Video records or photographs of the existing condition and final condition of the local roads proposed for haul routes.
7. Sample manifest(s) or Bill of Lading to be used for the project.
8. Description of conveyance system piping and pumps (number and type) to be used for water transport from active soil disturbance areas to storage tanks for off-site disposal or on-site treatment via a temporary construction water treatment system.

C. Submit the following:

1. Copies of local, state, and federal transport permits, licenses, and approvals
2. Waste Transporter Permits: Submit copy of valid NYSDEC waste transporter permit for each transporter hauling contaminated material.
3. Disposal Records: Contractor to obtain and provide to the Engineer counter-signed manifests, bills of lading, weight tickets, receipts, and invoices for disposal facility(ies) on a monthly basis throughout the Project, and concurrent with each Application for Payment.
4. Weekly tracking summary report that includes the type of waste material, weight, volume, disposal/recycle location, date of shipment, date of receipt, and responsible transporter.
5. Contractor to provide copies of waste characterization results, as necessary.

1.6 QUALITY CONTROL

A. Transportation and Disposal Coordinator

1. Designate, by position and title, a Transportation and Disposal Coordinator (TDC) for this contract. The TDC serves as the single point of contact for all environmental regulatory matters and has overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and proper classification of all waste generated during the project; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, applicable waste manifests or bill of ladings, exception and discrepancy reports; and all other environmental documentation. The TDC shall have at a minimum, one year of specialized experience in waste management and transportation and have been DOT certified under 49 CFR 172, Subpart H.

B. Training

1. Train, test, and certify hazardous materials employees to safely and effectively carry out their assigned duties in accordance with the Approved Health and Safety Plan. Train, test, and certify in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans, the employees transporting hazardous materials or preparing hazardous materials for transportation, including samples. Train, test, and certify in accordance with 49 CFR 172, Subpart H employees making determinations that shipments do not constitute DOT regulated hazardous materials.

C. Certification

1. Possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), DOT, when required by 49 CFR 107, Subpart G

for transporting hazardous materials. Submit copies of the certificates or written statements certifying exemption from these requirements.

D. Laws and Regulations Requirements

1. Work shall meet or exceed the minimum requirements established by federal, state, and local laws and regulations which are applicable. These requirements are amended frequently. Comply with all amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, notify Owner immediately.

1.7 PACKAGING

A. Provide containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section 101, Column 8.

B. Meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Materials Table, 49 CFR 172, Section 101 for bulk and non-bulk packaging.

C. Conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section 101, and be compatible with the material to be packaged as required by 40 CFR 262.

D. Provide other packaging related materials such as materials used to cushion or fill voids in over packed containers, etc.

E. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged. Use non-biodegradable sorbents to treat free liquids to be disposed of in landfills as specified in 40 CFR 264, Section 314.

1.8 MARKINGS

A. Provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D, 40 CFR 262, Section 32 for hazardous waste. Markings shall be capable of withstanding, without deterioration or substantial color change, a 180-day exposure to conditions reasonably expected to be encountered during container storage and transportation.

1.9 LABELING

A. Provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section 101, Column 6. Meet design specifications required by 49 CFR 172, Subpart E including size, shape, color, printing, and symbol requirements. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180-day

exposure to conditions reasonably expected to be encountered during container storage and transportation.

1.10 PLACARDS

A. For each off-site shipment of hazardous material/waste, provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Provide placards for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30-day exposure to open weather conditions and meet design requirements specified in 49 CFR 172, Subpart F.

1.11 SPILL RESPONSE MATERIALS

A. Provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Make available spill response materials at all times in which hazardous materials/wastes are being handled or transported. Ensure spill response materials are compatible with the type of material being handled.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 ON-SITE WASTE MANAGEMENT

A. Ensure compliance and be responsible for all federal, state, and local waste laws and regulations and verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents.

B. Properly segregate and manage the soil, debris materials, concrete, and asphalt from the Work Area in order to avoid commingling of waste streams and minimize the cost of material sent off site for disposal.

C. Identify hazardous wastes using criteria set forth in 40 CFR 261, 40 CFR 761 and all applicable state and local laws, regulations, and ordinances.

D. When accumulating hazardous waste onsite, comply with generator requirements in 40 CFR 262 and any applicable State or local laws or regulations (6 NYCRR, Part 370-376).

1. Cover and secure all stockpiles when not active with plastic sheeting to prevent erosion of the stockpiles or uncontrolled runoff while promoting runoff of precipitation. Maintain stockpiles in accordance with the requirements in the stormwater pollution prevention plan (SWPPP) and the CAMP.

2. Commence accumulation start dates when waste is first generated (i.e., containerized or otherwise collected for discard).

3. Only use containers in good condition and compatible with the waste to be stored. Use the following waste containers for transportation and storage of the corresponding waste material:

   a. Use tri-axle trucks or dump trailers for loading and transporting historic fill from the Work Areas, including contaminated material (soil, concrete/masonry, metal, and all other debris). Trucks shall be in good working order; beds sealed with impervious liners; odor controls applied as required; covered with impervious tarps that are in good condition. All trucks shall be equipped with functional backup alarms.

   b. Use 55-gallon drums for disposable PPE. Plastic bags shall have a minimum thickness of 6 mils.

   c. Appropriate containers and/or trucks for the management and off-site disposal of non-contaminated material from the excavation areas and all other non-contaminated debris removed during site preparation, clearing, and grubbing activities, etc. Appropriate containers and/or trucks for management of asphalt/concrete pavement.

   d. Portable, temporary storage tanks (e.g., FRAC tanks, etc.) for the storage/treatment of collected liquids (i.e., decontamination fluids and pumped water from excavation areas).

   e. Secondary spill containment greater than or equal to one hundred and ten percent (110%) of the volume of portable temporary storage tanks (e.g., FRAC tanks).

   f. Containers (e.g., roll-off containers) for non-hazardous municipal trash and debris. Utilize roll-off containers for storage of wastes generated during the site preparation activities, construction activities, and waste materials from site cleanup activities. All containers are to be sealed with impervious liners and covered with impervious tarps.

   g. DOT-approved, steel drums (55-gallon capacity) and secondary containment (for liquid drums) for possible storage of residual contaminated material and/or decontamination water or miscellaneous materials.

4. Be responsible for ensuring containers are closed except when adding or removing waste, and for immediately marking all hazardous waste containers with the words “hazardous waste” and other information required by 40 CFR 262, Section 32 and any applicable state or local law or regulation as soon as the waste is containerized.

5. Place additional marking on containers of “unknowns” designating the date sampled and the suspected hazard.

6. Inspect containers for signs of deterioration and for responding to any spills or leaks.

7. Inspect all waste areas weekly and provide written documentation of the inspection. Inspection logs shall contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

8. Control vapor, odor, and dust caused by excavation, stockpiling, material management, operating machinery, or for any reason whatsoever. Utilize dust and odor mitigation in accordance with Specification Section 01110 – Environmental Protection Procedures.

9. Properly manage contaminated water resulting from construction activities in accordance with Specification Section 02145 – Water Treatment and Disposal.

E. Hazardous Waste Classification

1. Identify, in consultation with the Engineer and Owner, all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 and any applicable federal, state, or local law or regulation.

2. Collect waste characterization samples and perform laboratory testing of the following materials:

   a. Surplus soil

   b. Excavated materials

   c. ISS spoils

   d. Residual solids collected from erosion and sedimentation control measures, decontamination areas, and water treatment system sumps and influent tanks.

   e. Collected liquids (i.e., decontamination fluids, construction dewatering, etc.)

3. Identify all applicable treatment standards in 40 CFR 268 and state land disposal restrictions.

4. Provide to Engineer determination whether the waste meets or exceeds the applicable standards for disposal facility. Sampling methods, frequency, and analyses shall be in accordance with the requirements of designated off-site disposal facility or the NYSDEC discharge criteria. Perform laboratory testing by NYSDOH-ELAP laboratory. Conform all sampling procedures to federal, state, and local requirements. Provide results of sampling and analysis to Engineer and Owner prior to final disposal.

5. Submit to Engineer and Owner for review and approval the waste profiles, analyses, waste classification, and treatment standards information.

3.2 OFF-SITE WASTE MANAGEMENT

A. Stabilization and dewatering of removed material to meet the requirements of the selected offsite treatment/disposal facility (e.g., paint filter test, additional moisture content requirements), prior to the transportation of such materials to the offsite permitted treatment/disposal facility.

1. Dewater material as necessary to pass Paint Filter Liquids Test (USEPA SW-846 Method 9095B) prior to leaving the Site, as well as comply with additional moisture requirements from treatment and disposal facilities.

2. Dewatering shall include the following:

   a. Gravity dewatering within the material staging area.

   b. Use of an approved drying agent to amend materials. Unless otherwise directed by the Engineer, removed materials shall be amended with no more than ten percent drying agent by weight.

B. Use Owner approved RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. Do not use off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into groundwater, surface water, soil, or air).

C. Non-hazardous Waste will be shipped off-site using a bill of lading to an approved solid waste landfill. Submit Notices of Non-Compliance and Notices of Violation by a federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. Immediately provide copies of such notices to the Owner.

D. Furnish all relevant documents regarding the incident and any information requested by the Engineer and Owner and coordinate its response to the notice with the designated representative prior to submission to the notifying authority.

E. Furnish a copy to the Owner of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

F. TSDF and Transporter:

1. Provide Engineer and Owner with EPA ID numbers, names, locations, and telephone numbers of TSDF and transporters.

2. Include this information in the Waste Management Plan.

3. Obtain facility and transporter approval from Owner prior to waste transport and disposal.

F. Status of the Facility

1. Facilities receiving hazardous waste shall be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements

or permitted by a state authorized by the EPA to administer the RCRA permit program (6 NYCRR Parts 370-376).

G. Packaging, Labeling, and Marking

1. Package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced authorizations.

2. Mark each container of hazardous waste of 110 gallons or less with the following:

"HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal.

If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator's name _____

Manifest Document Number _____".

H. Shipping Documents

1. Ensure that each shipment of waste sent off-site is accompanied by properly completed shipping documents. This includes shipments of samples that may potentially meet the definition of a DOT-regulated hazardous material.

2. Other Hazardous Material Shipment Documents

a. Prepare a bill of lading for each shipment of waste which is not accompanied by a hazardous waste manifest which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C (for USDOT hazardous materials), and 40 CFR 279 if shipping used oil and any applicable state or local law or regulation, and submit to the Owner for review and approval.

b. For laboratory samples and treatability study samples, prepare bills of lading and other documentation as necessary to satisfy conditions of the sample exclusions in 40 CFR 261, Section 4(d) and (e) and any applicable TSCA, state or local law or regulation.

c. Sign bill of ladings requiring shipper's certification.

I. Transportation

1. Prior to conducting hazardous materials activities, manage pre-transportation activities and either certify to Owner that a Security Plan is in place which meets the requirements of 49 CFR 172, Subpart I or in the event that the types or amounts of hazardous materials are excluded from the security planning requirements, a written statement to that effect detailing the basis for the exception.

2. Comply with all requirements in the DOT referenced regulations in the 49 CFR series.

3. Prepare hazardous waste manifests or bills of lading for each shipment of waste offsite.

4. Submit manifests/bills of lading and waste profiles to the Engineer and Owner for review and approval on a weekly basis or more frequently if requested by Owner.

5. Prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste.

6. In accordance with DOT 4500.9R, inspect motor vehicles used to transport hazardous materials in accordance the 49 CFR and DOT safety regulations and complete DD Form 626, Motor Vehicle Inspection.

7. All trucks transporting material off-site will be lined, covered, and be equipped with a sealed tailgate. Trucks used to haul material off-site must have NYSDEC Part 364 transporter permits and contain the appropriate NYSDOT placarding for waste transport, as applicable.

8. The beds of transport trucks loaded with Site materials will be properly covered and secured with polyethylene sheeting and tarps prior to leaving the Site. If required, odor and dust control measures will be conducted on transport trucks as well.

9. If the tires of the transport trucks to be used for transport come into contact with impacted Site materials, (e.g., excavated soils, ISS swell materials, or construction water) the tires will be cleaned in accordance with Specification Section 02125 - Decontamination prior to transport outside of the grading area.

J. Treatment and Disposal of Wastes:

1. Transport wastes to an Owner-approved waste TSDF.

2. Ship wastes only to facilities which are properly permitted and willing to accept the specific waste stream.

3. Ensure wastes are treated to meet any land disposal treatment standards in 40 CFR 268 prior to land disposal.

4. Propose TSDFs via submission of the Waste Management Plan, subject to the approval of Con Edison.

5. Submit Certificates of Disposal documenting the ultimate disposal, destruction, or placement of all wastes from the site, within thirty (30) calendar days of initial shipment. Receipt of these certificates will be required for final payment.

3.3 RECORDKEEPING

A. Submit all waste characterization, transportation, and disposal documentation to Owner.

B. Maintain adequate records to support information provided to Owner regarding exception reports, annual reports, and biennial reports.

C. Maintain waste shipment records for a minimum of three (3) years from the date of shipment or any longer period required by any applicable law or regulation or any other provision of this contract.

D. Submit information necessary to file State annual or EPA biennial reports for all hazardous waste transported, treated, stored, or disposed of under this contract to Owner at the specified time or at the completion of the contract. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing federal or state regulatory agency. A cover letter shall accompany the data to include the contract number, Contractor name, and project location.

E. In the event that a manifest copy documenting receipt of hazardous waste at the TSDF is not received within 35 calendar days of shipment initiation, or that a manifest copy documenting receipt of waste at the designated facility is not received within 35 calendar days of shipment initiation, prepare and submit an exception report to Owner within 45 calendar days of shipment initiation.

3.4 SPILL RESPONSE

A. In the event of a spill or release, notify Owner immediately. Any direction from Owner concerning a spill or release shall not be considered a change under the contract.

B. Comply with all applicable requirements of federal, state, or local laws or regulations regarding any spill incident.

3.5 EMERGENCY CONTACTS

A. Comply with all emergency contact provisions in 49 CFR 172, Section 604.

B. When shipping hazardous materials, provide a 24-hr emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information.

C. Monitor the phone on a 24-hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation.

D. Ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents.

*** END OF SECTION 02120 ***

SECTION 02145

WATER TREATMENT AND DISPOSAL (AS REQUIRED)

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, equipment, and materials, and execute all activities necessary to collect, handle, and containerize all liquids generated during work performed under this contract requiring treatment.

B. As necessary, the Contractor shall treat water on site, furnish all labor, equipment and materials and execute all activities necessary to provide power, operate, and maintain a temporary water treatment system. The temporary water treatment system would be designed by a registered Professional Engineer retained by the Contractor and licensed to practice in the state of New York. The Contractor's Professional Engineer would specify a temporary water treatment system that is designed based on sound, industry-accepted design principles and consists of proven treatment technologies and configurations. The water treatment system would meet the treatment standards (e.g., site specific NYC discharge limits in Table 1) and provide sufficient flow rate to allow the work to proceed without delay.

C. If necessary, provide a temporary water treatment system including all labor, equipment, and materials to permit, install, operate, decommission, decontaminate, and demobilize.

D. Perform all sampling and analysis required for operation and maintenance of the water treatment system. Maintain compliance with all applicable discharge permits.

E. Provide all material and labor associated media change outs, waste characterization, transport and disposal of spent media, and all other costs associated with its operation.

F. Liquids that must be managed and treated and discharged/disposed of off-site include, but are not limited to:

1. Rainfall runoff which accumulates in excavation or containment areas.
2. Direct precipitation in excavation or containment areas.
3. Water generated from dewatering activities.
4. Water generated from equipment and personnel cleaning activities.
5. Groundwater/surface water encountered during remedial activities (if not incorporated in the ISS activities as approved by Engineer) and excavations, including within abandoned structures (e.g., pipes, underground storage tanks, etc.).
6. Other water generated as a result of construction activities.

G. Alternately, the Contractor may elect to store water on site, perform waste characterization and arrange for transfer and transportation to an Owner approved Treatment, Storage, and Disposal Facility (TSDF).

1.2 REFERENCES

A. NYSDEC SPDES General permit for Stormwater Discharges from Construction Activities

B. NYC Administrative Code Chapter 5-A: Water Pollution Control

C. NYC Administrative Code Chapter 19: Use of the Public Sewers

D. NYC Noise Ordinance

1.3 SUBMITTALS

A. Provide a Water Treatment/Disposal Plan as part of the Construction Plan in accordance with Specification Section 01350—Document Submittal Procedures to Engineer for their review, which shall include the following information pertaining to the water treatment system:

1. Collection and Storage System

   a. The Contractor shall submit, as part of the Construction Plan, details on the means and methods for collecting and storing water prior to treatment, or alternate prior to off-site disposal.

2. Treatment system plan/design

   a. Submit, as part of the Construction Plan, details on the means and methods for treating water generated during construction activities.

   b. Information on the startup, initial testing, operation, maintenance, decommissioning, decontamination and demobilization of the treatment system as outlined in this Section.

   c. A complete list of all materials and chemicals to be utilized in the operation of the water treatment system, as well as all associated Material Safety Data Sheets (MSDS)s.

3. Shop Drawings

   a. Prepare and submit shop drawings for each component of the water treatment system that presents the following information:

1) Drawings showing location of equipment, elevations, devices, line sizes, valving, utility (air, water, drain, electric) line sizes, and connections.

2) Vessel shop or fabrication drawings with all dimensions indicated. Include identification and catalog cuts for purchased components and details for manufactured components.

3) Applicable certifications and ratings.

4) Detailed drawings illustrating equipment arrangement, bill of materials, weights (dry and operating), and plan view system drawing.

5) Elementary control diagrams.

4. Construction Water Management Procedures

a. Submit Construction Water Management procedures as part of the Construction Plan for the Engineer's approval. The procedures shall include, but not be limited to, the Contractor's proposed method of handling, sampling, analyses, storage, and disposal of construction water generated during construction. Methods of minimizing the generation of construction water shall be identified.

b. The acceptable methods of handling construction water are limited to collection and off-site disposal at a permitted treatment facility, on-site treatment and disposal in accordance with applicable discharge permit requirements, or use in the ISS process, if not detrimental to the ISS process.

1.4 DEFINITIONS

A. Construction Water: Construction water shall be defined as the following:

1. Liquids generated during decontamination activities.

2. Surface water and/or groundwater that is collected, pools or requires removal from contaminated work areas and surfaces including excavations, stockpiles, demolition debris and in-situ stabilization/ solidification (ISS) activities.

B. Construction Water does not include water incident upon non-disturbed excavation areas. This water shall be diverted from the excavation area as required to minimize the potential for contact with the construction operations.

C. Operation & Maintenance (O&M) Manual

1. Prepare and submit the O&M Manual for the water treatment system that includes a general narrative detailing the Contractor's O&M activities. The O&M Manual shall include the following information (as applicable) for each major system component:

    a. Start-up testing, normal (daily) operations, trouble shooting, and shut down procedures.

    b. Preventative or routine maintenance requirements.

    c. Sampling plan, including sampling locations, analytes, frequency and schedule.

    d. Recommended spare parts list.

    e. Calibration and alignment information.

    f. Manufacturer's O&M Manuals.

    g. Emergency shutdown procedures due to loss of power or other interruption of operations.

    h. Spill Prevention and Secondary Containment provisions.

    i. Winter Operations and Freeze protection procedures.

PART 2 - PRODUCTS

2.1 GENERAL

A. This section outlines the design and construction requirements for anticipated major treatment system components. Final selection of products and components must be submitted and approved by the Owner and the Engineer. Do not modify equipment in the field without written approval from the manufacturer.

2.2 BERMS AND CONTAINMENT

A. Construct a containment area for the water treatment system. The containment area shall be constructed in accordance with the Construction Drawings and the Contractor's submittals which are subject to review by the Engineer. The water treatment system containment area shall be constructed as indicated on the Construction Drawings and, at a minimum, shall meet the following requirements:

1. The area to be used to stage the temporary water treatment system shall be graded and sloped to a low point to form a collection sump.

2. A minimum 8-inch high berm shall be constructed of gravel, or approved equal, along the perimeter of the temporary water treatment system containment area necessary to provide secondary containment equal to a minimum of 110% of one

storage tank for the temporary water treatment system (approximately 23,100 gallons), and a one-year, 24-hour storm event of approximately 2.5 inches.

3. The containment area shall be lined with a layer of reinforced and textured 40-mil linear low-density polyethylene (LLDPE) liner. The liner shall be installed continuously along the bottom of the containment area and sloped to a LLDPE-lined sump to allow for collection of liquids. If more than one LLDPE panel is required in the containment area, the panels shall be welded and have a minimum 4-foot overlap with the exposed (overlapping) edge pointed downslope towards the sump. The liner shall be extended over the top and outside face of the berm. The outside face of the liner shall be adequately secured.

4. In order to protect the integrity of the liner, two layers of non-woven geotextile fabric shall be installed between the liner and the ground surface. In addition, approximate 6 inches of gravel crushed stone shall be installed on top of the LLDPE liner to act as a working surface that protects the liner from equipment and material movement and also provide a non-slip surface for working personnel.

B. Do not involve any equipment or procedures that may jeopardize the integrity of the LLDPE liner.

C. Pump liquids that accumulate within the sump to the influent storage tanks of the temporary water treatment system. The Contractor should take precautions to minimize the amount of solids transferred to the water treatment system.

D. The containment area shall be inspected daily (when operating personnel are onsite) and any noted deficiencies shall be promptly corrected.

E. A temporary vehicle access ramp(s) over the edge of the berm shall be constructed of gravel, as needed. However, the ramp(s) shall not impede the flow of truck/equipment traffic on-site.

F. Waste Characterization and final disposal of stone within the containment area shall be the responsibility of the Contractor.

2.3 ENCLOSURES FOR TREATMENT SYSTEM

A. Construction activities are anticipated to be conducted year-round (with some operations occurring during winter construction periods) and, therefore, temporary water treatment system enclosures may be needed for thermal protection. If it is determined that thermal protection is needed, enclosures or equipment selection will be required to prevent cold-weather related issues with treatment system operation.

B. Temporary equipment enclosures or equipment selection shall be required to maintain decibel levels in accordance with the NYC Noise Ordinance.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide power, operate and maintain a water treatment system as described in this specification that shall be used to treat liquid waste streams in accordance with the Contract Documents. The Contractor is responsible to operate the water treatment system and maintain compliance with the NYC Stormwater Construction Permit to be obtained by the Contractor and shall maintain lines of communication with the Owner regarding all discharge issues related to permit compliance.

B. Estimate the quantity and quality of construction water expected for this project based on the existing site conditions.

C. Investigate and comply with all applicable Federal, State, and local laws and regulations governing the handling, storage and disposal of construction water. Dispose of construction water in a manner which meets applicable permit requirements, laws, and regulations.

D. Obtain all required permits, manifests, and approvals required for the handling, storage, transport, treatment and disposal of construction water and residuals generated during construction water management.

E. Any sampling and analyses necessary to protect the health and welfare of the Contractor's employees and/or agents and/or to characterize collected water, treated water, or residuals shall remain the sole responsibility of the Contractor.

F. Construction water shall be handled using equipment compatible with anticipated contaminants which may be present.

3.2 MINIMIZATION OF CONSTRUCTION WATER

A. Make every effort to minimize the generation of construction water and associated sediments and sludges. Methods to minimize generation of construction water include, but are not limited to:

1. Erection of temporary berms.
2. Use of low permeability tarpaulin or suitable means to cover exposed contaminated material stockpiles.
3. Limiting the amount of exposed contaminated excavation areas.
4. Grading to control run-on and run-off.
5. Engineering controls for construction activities to minimize contact of personnel and equipment with contaminated areas that will minimize the amount of decontamination required and other appropriate methods.
6. Incorporation of groundwater/surface water encountered during remedial activities in ISS activities (as approved by Engineer).

3.3 COLLECTION OF LIQUIDS

A. All liquid that requires handling and treatment/disposal shall be collected and transferred to the temporary water treatment system. The method(s) by which water is collected shall be conducted in a manner that prohibits the spillage, leakage, or other release of water as collected.

B. Maintain timely and accurate records concerning the volumes and areas from which accumulated liquids are removed and transported to the treatment system.

C. All equipment utilized to collect/handle accumulated liquids, including pumps, tanks, and tanker trucks, as appropriate, shall be decontaminated by the Contractor prior to removal from the Site.

3.4 HANDLING AND STORAGE

A. Store all liquids in containers acceptable to the Owner and reviewed by the Engineer.

B. Clearly mark all storage containers to indicate the known or suspected contents, source area(s), and date(s) of generation.

3.5 DISCHARGE LIMITS

A. Maintain the treatment system so as to not exceed the substantive requirements for water discharge identified in Table 1 at the end of this Section. The discharge limits provided in Table 1 are based on the NYCDEP Limitations for Effluent to Sanitary or Combined Sewers. The Contractor is responsible to submit their own Wastewater Quality Control Application for any discharges.

3.6 TESTING AND STARTUP ACTIVITIES

A. After mobilization and setup of the water treatment system, perform system startup and testing activities and troubleshooting prior to initiating full scale (normal) operations. Startup and testing activities shall be in accordance with the manufacturer's recommendations as indicated in the Contractor-prepared O&M Manual that has been reviewed by the Engineer. General startup and testing of the temporary water treatment system shall consist of treating a minimum of 40,000 gallons of water collected from the first proposed excavation area (i.e., water that has been in contact with soil to be removed). During the startup test, the water treatment system shall be operated at the designed peak flow rate until the entire 40,000 gallon batch is treated. During this time, continuously monitor and record readings (every 30 minutes minimum) from all gauges, flow meters, etc. as necessary in order to demonstrate that the system is operating, including all treatment system backwash and recycle functions, as designed to the satisfaction of the Engineer. In addition, make adjustments to the system as necessary to maintain a continuous flow rate at the peak design flow, while meeting the operating requirements of each system component. Collect start-up testing samples following treatment of approximately 10,000 gallons, 25,000

gallons and 40,000 gallons of water. The entire 40,000 gallons of treated water shall be retained in the effluent storage tanks until analytical results indicate that the Contractor may discharge the water to the onsite drainage ditch. Samples collected during start-up shall be submitted for laboratory testing for the parameters listed on Table 1 of this document.

3.7 SYSTEM MONITORING

A. Water Quality Testing

1. Treatment system water quality testing shall also be conducted during normal operations. During the first month of operation, testing shall be conducted once per week. During and after the second month of operation, extending until system shutdown, testing shall be conducted once per month. Operational sampling shall be collected in accordance with the SPDES Equivalency Permit obtained by the Contractor.

B. Routine Monitoring

1. The water treatment system shall initially be manually operated and controlled through a series of valves, visual reading gauges, and pump controls as necessary to accommodate system operation. Provide for a water treatment system operator to be on-site during system operation. As operating experience is gained, the Contractor may add additional controls and alarms approved by the Engineer to eliminate the need for an on-site operator. At a minimum, the daily activities to be initially performed by the system operator (at least once per shift) include, but are not limited, to the following:

   a. Control of all tank valves, as necessary, to fill and drain the tanks.

   b. Visual inspection of influent and effluent piping to and from the treatment system.

   c. Visual inspection of influent piping to ensure no leakage is occurring.

   d. Visual inspection of the tanks to avoid overfilling.

   e. Visual inspection of all pumps, fittings and equipment to ensure no leakage is occurring.

   f. Visual inspection of containment liner to ensure it remains in good condition.

   g. Obtaining readings from the system pressure gauges associated with all treatment systems within the treatment train. Pressure gauge readings may be used to determine when a backwash event or filter replacement is required or that a particular treatment unit is not functioning properly.

h. Obtaining readings from the system flow meters to monitor the system flow rates.

i. Obtaining readings from the effluent flow totalizer to record the total system flow to date and calculate the daily flow total.

j. During the operation of the treatment system, the influent tanks shall be visually inspected each time they are emptied to determine the depth of the sediment in the bottom of the tank. If sediment is observed to be 4 inches deep (or if directed by the Engineer) the tank shall be cleaned. Liquids which result from the cleaning activities shall be treated using the water treatment system, while solids shall be collected for subsequent disposal.

k. Collect, at a minimum once per day, the following water quality field data: turbidity and pH within the treatment train to provide indications of system performance at the influent and effluent ends of the system.

3.8 CORRECTIVE ACTIONS

A. At the direction of the Owner or Engineer, take corrective actions as necessary to maintain specified treatment system performance in the event of an upset condition and/or operating conditions that result in non-compliant effluent water quality. During corrective actions, the Contractor may be required to mobilize additional effluent storage tanks and/or repeat start-up and testing procedures as specified herein. If the Contractor fails to make these corrections, or if the improved equipment fails to meet the guarantees or specified requirements, the Owner, notwithstanding having made partial payment for work and materials which have entered into the manufacture of said equipment, may reject said equipment and order the Contractor to remove it from the premises at the Contractor's expense.

3.9 DOCUMENTATION

A. Maintain a daily operations log (i.e., tabulated results) in which the process variables described above shall be recorded. In addition, all activities related to O&M of the treatment system shall be documented in the daily log. The daily log shall be kept onsite and shall be made available to the Engineer on demand.

Table 1

NYCDEP Limitations for Effluent to Sanitary or Combined Sewers

Parameter[1]	Daily Limit	Units	Sample Type	Monthly Limit
Non-polar material[2]	50	mg/l	Instantaneous	---
pH	5-12	SUs	Instantaneous	---
Temperature	< 150	Degree F	Instantaneous	---
Flash Point	> 140	Degree F	Instantaneous	---
Cadmium	2 0.69	mg/l mg/l	Instantaneous Composite	--- ---
Chromium (VI)	5	mg/l	Instantaneous	---
Copper	5	mg/l	Instantaneous	---
Lead	2	mg/l	Instantaneous	---
Mercury	0.05	mg/l	Instantaneous	---
Nickel	3	mg/l	Instantaneous	---
Zinc	5	mg/l	Instantaneous	---
Benzene	134	ppb	Instantaneous	57
Carbontetrachloride	---	---	Composite	---
Chloroform	---	---	Composite	---
1,4 Dichlorobenzene	---	---	Composite	---
Ethylbenzene	380	ppb	Instantaneous	142
MTBE (Methyl-Tert-Butyl-Ether)	50	ppb	Instantaneous	---
Napthalene	47	ppb	Composite	19
Phenol	---	---	Composite	---
Tertrachloroethylene (Perc)	20	ppb	Instantaneous	---
Toulene	74	ppb	Instantaneous	28
1,2,4 Trichlorobenzene	---	---	Composite	---
1,1,1 Trichloroethane	---	---	Composite	---
Xylenes (Total)	74	ppb	Instantaneous	28
PCBs (Total)[3]	1	ppb	Composite	---

Parameter[1]	Daily Limit	Units	Sample Type	Monthly Limit
Total Suspended Solids (TSS)	350	mg/l	Instantaneous	---
CBOD	---	---	Composite	---
Chloride	---	---	Instantaneous	---
Total Nitrogen[4]	---	---	Composite	---
Total Solids	---	---	Instantaneous	---
Other				

1 All handling and preservation of collected samples and laboratory analyses of samples shall be performed in accordance with 40 C.F.R. pt. 136. If 40 C.F.R. pt. 136 does not cover the pollutant in question, the handling, preservation, and analysis must be performed in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater." All analyses shall be performed using a detection level less than the lowest applicable regulatory discharge limit. If a parameter does not have a limit, then the detection level is defined as the method detection limit (MDL) and limit of quantitation (LOQ) required by the analytical method that is used to analyze the parameter. If the method does not contain an MDL or LOQ, the lab must use an approved method that does contain an MDL or LOQ. If none of the approved methods contain an MDL or LOQ for that parameter then the lab must develop its own LOQ, and report it with the analytical results.

2 Non-polar material means that portion of the oil and grease that is not eliminated from a solution containing N-Hexane, or any other extractant the EPA shall prescribe, by silica gel or any other means of adsorption the EPA shall prescribe.

3 Analysis for PCBs is required if duration of a discharge is greater than 10 days. Analysis for PCBs must be done by EPA method 608 with MDL=<65 ppt. PCBs (total) is the sum of PCB-1242 (Arochlor 1242), PCB-1254 (Arochlor 1254), PCB-1221 (Arochlor 1221), PCB-1232 (Arochlor 1232), PCB-1248 (Arochlor 1248), PCB-1260 (Arochlor 1260) and PCB-1016 (Arochlor 1016).

4 Total Nitrogen = Total Kjeldhal Nitrogen (TKN) + Nitrite (NO_2) + Nitrate (NO_3).

*** END OF SECTION 02145 ***

SECTION 02160

IN-SITU STABILIZATION/SOLIDIFICATION USING AUGER MIXING

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the minimum requirements for in-situ stabilization/solidification (ISS) and related work as shown on the Construction Drawings and as hereinafter specified.

B. The work consists of furnishing labor, equipment, materials, supervision, transportation, and incidentals necessary to complete the work; and performing all operations as required to construct the ISS treated areas.

C. Removal of subsurface features including existing facilities, utilities, foundations, and remnant structures encountered during the Work.

1.2 DEFINITIONS

A. Bedrock refusal: A condition that occurs during mixing when the equipment has reached its advancement limit at or near the anticipated depth of bedrock (as agreed upon by the Owner and/or Engineer) and can no longer be advanced. Defined as less than 6 vertical inches of penetration per minute over a 10-minute period, or as determined by the Owner and/or Engineer based on an evaluation of equipment operation data and field data.

B. Bottom of Column Elevation. The depth to which the ISS column was installed as measured to the lowest continuous surface on the auger head.

C. Debris: Solid material exceeding a 3-inch particle size. Debris includes, but is not limited to, manmade material identified within the Work Area that may include, but is not limited to, concrete, asphalt, pilings, brick, plastics, rubber, tires, wire, cable, metal, anchors, trash, monitoring well materials, and other miscellaneous materials. Further, some naturally occurring materials, such as timber logs, tree stumps, branches, and loose pieces of wood that may interfere with ISS or removal activities are considered debris. Riprap and boulders are not considered debris.

D. Extraction Rate: The rate, in feet per minute, at which the mixing auger is retracted from the ISS column.

E. Grout: A stable colloidal suspension of powdered materials which may include reagents (e.g., Type I/II Portland cement, Ground Granulated Blast-Furnace Slag [GGBFS]), additives, and/or other similar materials in water.

F. Homogeneous Mixture: A uniform, unvarying, and consistent blend of impacted soil, grout, and liquids, free from NAPL blebs and free from pockets of unmixed materials and free liquids.

G. Injection Ratio: A volumetric ratio of grout to soil (e.g., 100 gallons per cubic yard) to be mixed in an ISS column. The injection ratio is determined for each column based on the column dimensions, soil density, pattern of treatment, and target Reagent Addition Ratio.

H. In-Situ Stabilization/Solidification (ISS): A soil mixing technique used to construct in situ soil structures or treat soils in place, without excavation or dewatering. ISS mixing types include: auger mixing and excavator bucket mixing. Stabilized soil columns or cells are created that may be joined together by overlapping columns to form a treated volume of soil.

I. ISS Area: The portion of the Site requiring ISS treatment as shown on the Construction Drawings.

J. ISS Column: One completed cycle (one or more mixing passes top to bottom of the ISS column and back to top) of ISS mixing to the design depth (Bottom of Column Elevation) including insertion, injection, and mixing of the soil. This creates a cylindrical column of treated soil. The column may be primary (through untreated soils) or secondary (connecting two primary columns).

K. ISS Cell: An area of the site that has received the addition of grout and has been thoroughly mixed to create a homogenous unit of solidified soil extending from the top surface down to the target depth.

L. ISS Spoils: The excess material resulting from adding grout to the in-situ soils. The spoils are typically a mixture of soil and grout similar to the materials in the ISS column.

M. Mixing Auger: A large diameter drilling and mixing tool (typically 3- to 10-ft diameter) typically fitted with auger blades, grout injection ports, and mixing paddles that is advanced into the ground while injecting grout into the soil.

N. Mixing Energy: A measure of mixing effort for each column expressed as number of mixing cycles (i.e., rotations) per unit length of ISS Column.

O. Mixing Pass: Operation of the auger mixing tool from the top of the column to the bottom and back to the top. Generally, a number of passes are required to completely mix an ISS column. The number of passes required is dependent on the soil type and mixing equipment used.

P. Obstructions: Subsurface man-made or natural object that impedes mixing advancement to the specified design/target depth. The determination of what constitutes an obstruction

will be made in the field by the Owner and/or the Engineer based on field data. Information related to known debris, structures and utilities are included in the Contract Documents.

Q. Overlap Ratio: The ratio between the overlap distance (measured along the column diameter) and the diameter of the column. For example, a pattern of columns with a 15% overlap ratio has an overlap of 1.2-ft between two 8-ft diameter columns.

R. Penetration Rate: The rate, in feet per minute, at which the mixing auger is advanced into the ISS column.

S. Reagent Addition Ratio: A weight-based ratio of dry grout reagents to in-situ soil total wet weight (e.g., 10% addition rate = 10 pounds dry grout reagents per 100 pounds wet soil) to be mixed in an ISS column or cell. The reagent addition ratio shall be tested and evaluated as part of the start-up phase. The reagent addition ratio may be evaluated and determined for each column or cell based on soil density and characteristics, water table elevation, pattern of treatment, and other site conditions. Reagent addition ratios used during full-scale implementation shall be tested and evaluated as part of start-up phase. Assume a wet soil weight of 130 pounds per cubic foot, unless otherwise approved by the Engineer.

T. Obstruction Refusal: A condition that occurs during mixing when the equipment has reached its advancement limit at a depth less than what is anticipated for bedrock (as agreed upon by the Owner and/or Engineer) and can no longer be advanced either due to encountering obstructions or soil geotechnical properties. Defined as less than 6 vertical inches of penetration per minute over a 10-minute period, or as determined by the Owner and/or Engineer based on an evaluation of equipment operation data and field data.

U. Swell: The excess material resulting from volumetric expansion during grout addition to the in-situ soils. The swell is typically a mixture of soil and grout similar to the materials in the ISS column.

V. Unsatisfactory Materials: Materials brought to the Site that do not comply with the requirements for reagents listed in PART 2, PRODUCTS of this Section. Unsatisfactory materials include, but are not limited to, those materials containing roots and other organic matter, trash (i.e., refuse), debris, contaminated materials, frozen materials, or reagents that have become wet either prior to or after arriving at the site and before being mixed for use.

W. Water Addition Ratio: A weight-based ratio of water to dry grout reagents (e.g., a 1:1 ratio = 1 pound water to 1 pound dry grout reagents) used to produce the grout. The water addition rates shall be proposed by the Contractor as part of their mix design and tested and evaluated as part of the start-up phase.

X. Working Platform: The leveled surface of stable soils from which the ISS equipment operates.

1.3 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only and shall be the latest published revision.

1. American Society for Testing and Materials (ASTM) publications:

a. C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

b. C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars Using 2-in Cube Specimens

c. C150: Standard Specification for Portland Cement

d. C494: Standard Specification for Chemical Admixtures for Concrete

e. C989: Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

f. C1017: Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

g. D1633/D1623 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders

h. D2166: Standard Test Method for Unconfined Compressive Strength (UCS) of Cohesive Soil

i. D4832: Standard Test Method for Preparation and Testing of Controlled Low strength Materials (CLSM) test Cylinders; and

j. D5084: Standard Test Method for Measurement of Hydraulic Conductivity of saturated Porous Materials.

k. D6910: Standard Test Method for Marsh Funnel Viscosity of Construction Slurries

2. American Petroleum Institute (API) Publications:

a. Spec 13A: API Specification for Oil-Well Drilling Fluid Materials; and

b. RP 13B-1: API Recommended Practice Standard Procedure for Field Testing Water-Based Drilling Fluids.

1.4 SUBMITTALS

A. Qualification of Contractor's Personnel and Subcontractors.

1. Submit listing of Contractor's personnel and/or Subcontractors with their role, and primary responsibilities for approval by Con Edison. The evidence shall include references from at least five similar and successful projects constructed over the last 10 years. At least two of the projects shall include soil mixing adjacent to critical structures (e.g., buildings, road, towers, subsurface piping, electrical, and other such infrastructure) where prevention of settlement and mitigation of vibration were key elements of the project. Project descriptions shall include, at a minimum, the dimensions of work, type of grout, and equipment used.

2. Soil Mixing Specialist: A Soil Mixing Specialist shall supervise the construction, grout preparation, column mixing, and quality control. The Soil Mixing Specialist shall have at least ten years of experience and five projects in the successful construction of soil mixing projects, including at least five years of experience constructing large diameter ISS columns. At least two of the projects shall include soil mixing adjacent to critical structures where settlement and mitigation of vibration were key elements of the project. The Soil Mixing Specialist shall be present during soil mixing operations and shall not be assigned dual functions as Project Superintendent or Contractor Quality Control staff. This individual shall be knowledgeable of:

   a. Proper mixing methods employed to mix, control, and test grout;

   b. ISS construction equipment and tools, including auger mixing;

   c. In situ mixing injection ratios, overlaps, and overlap ratios; and

   d. ISS quality control testing in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

3. Submit company name, key contact, and qualifications of the Contractor's off-site laboratory. The laboratory shall have previous experience with soil mixed materials, experienced laboratory technicians, and modern laboratory testing equipment.

4. If Contractor personnel and/or the Subcontractors are not approved by Con Edison, Contractor shall provide alternates for Con Edison's review and approval.

B. ISS Work Plan

1. Submit a detailed ISS Work Plan (IWP) describing the proposed construction equipment, procedures, and schedules for the ISS treatment as part of the overall Construction Work Plan (CWP). This shall include, but not be limited to:

   a. A listing of supervisory personnel including the name and experience of the various persons, their role, and primary responsibilities.

   b. Equipment set-up and site use layout including storage areas, grout mixing plant location, haul routes, and work platform.

   c. Soil mixing equipment and reagent metering specifications, including maximum depth capability, dimensions of the auger mixing, and capacity of the grout mixing plant.

   d. Construction means and methods including a listing of construction steps and sequencing; handling of excess grout and spoils; layout; verticality, overlap control; and control of drainage, spills, and wastes. Contractor should take into consideration known debris/obstructions at the Site and presence of residual NAPL in proposed ISS area as indicated in the Contract Documents

   e. Layout drawing showing the geometry, overlaps, volume and dimensions of the column/cell overlapping pattern. The proposed ISS layout shall consider daily anticipated production rates, varying subsurface conditions across the site, overlaps to previously installed ISS columns/cells and overall column/cell mixing time to minimize re-molding of grout-soil mixing during initial curing. The proposed ISS column/cell layout shall show the center point of each column/cell and/or the corner points of each cell including the overlap between adjacent columns/cells. The proposed ISS column/cell layout shall include a table with point coordinates.

   f. ISS quality control procedures describing all testing, sampling, reporting forms, methods, responsible persons, non-conformance procedures, the NYSDEC's In-Situ Solidification QA/QC technical guidance, and all other means to ensure the quality of the work.

   g. Schedule: A Gantt chart schedule in Microsoft Project or Primavera P6 showing all major activities and durations.

C. Source of all materials, including mix water, reagents (Portland cement, ground granulated blast furnace slag [GGBFS]) and any additives. Submit certificates of compliance and/or certified test results verifying that the materials meet the requirements specified herein.

D. Submit the following items to the Engineer during the work:

1. Accurate daily records of the work, including a daily report indicating:

   a. ISS mixing method, reagent metering, equipment used and batch plant logs

   b. Column identification with updated layout drawing identifying columns completed

   c. Number of columns stabilized and running total

   d. Volume of soil stabilized and running total

   e. ISS Column Log for each column stabilized, including:

      1) Date
      2) Column identification and location
      3) Auger diameter and number of mixing blades
      4) Column diameter and length
      5) Design/Target and actual top of column elevation
      6) Design/Target and actual bottom of column elevation
      7) Estimated depth of key-in to bedrock subgrade if applicable
      8) Column start time
      9) Column time at bottom
      10) Column finish time
      11) Auger penetration rate and auger extraction rate
      12) Tool rpm and mixing energy
      13) Number of mixing passes
      14) Column mixing duration
      15) Column grout mix details, including quantities of reagents used (lbs), additives used (lbs), and water used (gal).
      16) Column grout injection ratio

17) Column neat volume (cy)

18) Total volume of grout injected per column (gal)

19) Notes on the appearance of the mixed material

20) Obstructions encountered

21) Unforeseen site conditions or equipment problems that affected ISS efforts

22) Any modifications or deviations from the Contract Documents or IWP. All modifications must be approved by the Engineer prior to implementation.

23) QC testing conducted including sample location, depth, type and number.

24) Weather and temperature

25) Air monitoring and mitigation measures

f. Material inventory, including quantities of grout reagents received and offloaded, used, and in storage.

g. Spoils and swell handling / management, including quantities disposed off-site.

h. Other pertinent observations

2. The results of QC tests as required by this Section.

3. Any change in the predetermined soil mixing program necessitated by a change in the subsurface conditions. All such changes must be approved by the Engineer prior to implementation.

E. As-Built Drawings. Within 30 days of completion of the Work in accordance with Section 01050 – Surveying and 01783 – Project Record Documents, submit to the Engineer as-built drawings showing ISS Column identification numbers, locations (Northings, Eastings), and as-built top and bottom column elevations. This will include rendered CADD surface files as well as point files for the installed columns.

F. Comply with the Contractor's Quality Control Plan (CQCP) and maintain a quality control program for the ISS construction.

1.5 RESTRICTIONS

A. Obtain any state and municipal permits (if required) and conform to all state and local regulations.

B. The Construction Drawings show approximate locations of known utilities. The Contractor will be responsible for the precise delineation and protection of all above and below ground utilities at the Site.

C. Environmental Restrictions

1. Contractor shall be responsible for any and all hazardous materials brought on-site (fuel, oil, etc.) and shall notify Owner and provide SDS sheets for any such materials. All materials brought on-site by Contractor shall be the sole responsibility of Contractor, including proper disposal or clean-up of any spills. The use of all chemicals and materials are subject to the review and approval of Con Edison.

2. Control of any water or fluids produced is the responsibility of Contractor.

3. Any environmental violations, including penalties or fines, that may occur on-site as a result of Contractor's actions are the responsibility of Contractor.

D. Working Hours Restrictions

1. Provide a schedule of working hours for review by Owner and Engineer in accordance with Specification Section 01140 – Work Restrictions.

E. Noise Restrictions

1. Local noise ordinances will need to be observed and any violations or complaints will be addressed and resolved by Contractor.

F. Dust, Vapor, and Odor Restrictions

1. Control of nuisance dust, vapor, and odors resulting from the Work is the responsibility of Contractor as per Section 01110 – Environmental Protection Procedures.

2. Comply with the Community Air Monitoring Plan (CAMP) requirements provided in the Remedial Design Report.

PART 2 – PRODUCTS

2.1 GROUT

A. Performance Criteria:

1. The material formed by mixing the grout with the in-situ soil shall meet the following minimum requirements:

Property	Requirement	ASTM Test Method
UCS	Greater than or equal to 50 psi at 28 days	D2166
Hydraulic Conductivity	Less than or equal to $1x10^{-6}$ cm/sec at 28 days	D5084

a. The UCS criteria shall be met for a daily or 500-cy batch testing as described in Subpart 3.9.

b. The hydraulic conductivity criteria shall be met for a daily or 500-cy batch testing as described in Subpart 3.9.

2. Uniformity of Mix: Reagents shall be mixed uniformly throughout each pass and consistent mixing energy shall be applied to result in a uniform and homogeneous mixture, as defined by the following criteria and as determined by the Engineer:

a. No visible non-aqueous phase liquids (NAPL) or sheen.

b. Reagent and soil are thoroughly intermixed in the column, with uniform and consistent color, soil graduation, moisture content, and consistency.

c. There are no unmixed pieces of soil greater than 3 inches in maximum dimension.

d. Columns that do not meet these criteria, as assessed by sampling as described in Subpart 3.9, shall be immediately addressed by the Contractor.

B. Grout shall be pumpable and workable with the mixing equipment, as appropriate.

C. Based on the results of the Bench Scale Treatability Study Report (Geo-Solutions 2023), ISS grout mixes that may be used for the Work consist of the following mixes:

Mix ID	Reagent Addition (% by wet soil weight)		W:C	Grout: Soil
	Portland cement	GGBFS		
M-1-1	2	4	2.00	-
M-1-2	3	6	1.50	-

2.2 REAGENTS

A. Portland cement: Portland cement used in preparing grout shall conform to ASTM C150 Type IL. Portland cement shall be protected from moisture and contamination in storage on the jobsite. Reclaimed cement or cement containing lumps or deleterious matter shall not be used.

B. GGBFS: GGBFS used in preparing grout shall conform to ASTM C989 Grade 100. GGBFS shall be protected from moisture and contamination while in storage at the Site.

C. Provide means for measuring dry reagents for grout mixing. Measuring devices shall include electronic scales and be calibrated to within ± 2% by weight. Provide documentation for the calibration. Measuring devices shall be calibrated per the manufacturer's recommendation and, at a minimum monthly.

2.3 WATER

A. Water used in preparing grout shall be potable water from an Engineer-approved source. It is the responsibility of the Contractor that the grout resulting from the water used shall always meet the requirements of this Section.

B. Provide a backflow preventor for all water services. Obtain permits, arrange for temporary connection to water service, and pay fees for water usage.

C. Provide means for measuring water for grout mixing. Measuring devices shall measure total and instantaneous flows and shall be calibrated to within ± 2 percent to accurately measure the water for each batch. Provide documentation for the calibration. Measuring devices shall be calibrated per the manufacturer's recommendation and, at a minimum monthly.

2.4 ADMIXTURES

A. Admixtures may be used to enhance the workability or final properties of the treated soil. Additives may be added to the water or the grout. Admixtures shall conform to ASTM C494. Flowing concrete admixtures shall conform to ASTM C 1017, Type I. Proprietary chemicals may be approved based on the results of pre-construction testing or other information provided by the Contractor at its expense. The Engineer shall approve proposed additives to be used.

2.5 MATERIAL MANAGEMENT

A. Protect containers and locations for material storage from precipitation, moisture, and other potential deleterious effects.

B. Ensure that containers for material storage are properly labeled in accordance with 29 CFR 1910.1200 - Hazard Communication.

C. Maintain onsite Safety Data Sheets (SDSs) for materials stored or used.

D. Control dust during offloading, storage, transportation, and mixing of reagents, in accordance with Specification Section 01110 - Environmental Protection Procedures.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

A. Employ the use of auger mixing equipment. When auger mixing equipment is used and subsurface obstructions are encountered that prevent the auger mixing equipment from penetrating to the specified depth, the location and depth penetrated by the auger mixing equipment shall be identified and marked. Remediate obstructions in accordance with Subpart 3.8 of this Specification Section.

B. Install soil erosion and sediment control devices prior to any major soil disturbance and maintain until permanent protection is established in accordance with Specification Section 01110 – Environmental Protection Procedures.

C. Prior to any subsurface work, notify federal, state, and local officials as required by law of subsurface work to be performed. Locate and clearly mark utility lines prior to performing earthwork.

D. Protect existing structures and site features and monitor structures (pedestrian walkway, building, etc.) in accordance with Section 13019 – Structural Monitoring.

E. ISS construction shall not be performed when the air temperature is below 20 degrees Fahrenheit or when severe weather conditions may compromise the quality of safety of the

work unless approved by Owner and/or Engineer and provided that proper cold weather provisions and measures proposed by the Contractor are previously approved.

F. Equipment and tools used by the Contractor to perform the work will be subject to inspection by the Engineer before the work is started and shall be maintained in satisfactory working condition at all times. Provide equipment adequate for and have the capability of producing the indicated ISS results specified herein.

G. Comply with applicable noise regulations and ordinances.

H. Remnant foundations and other subsurface obstructions should be anticipated at this Site. All obstructions shall be removed by the Contractor as necessary to facilitate ISS operations. The Engineer shall be notified immediately if an unanticipated obstruction is encountered that is preventing ISS advancement and requires removal.

3.2 SURVEYING

A. Conduct surveys in accordance with the requirements of Specification Section 01050 – Surveying.

3.3 EQUIPMENT

A. Equipment shall be of a type and capacity suitable for achieving the depths and at the rates required to construct the ISS areas as shown on Construction Drawings. Equipment manufacturer information for all ISS mixing equipment proposed to achieve the design depths will be provided to Engineer for review prior to mobilization. This will also include how ISS auger column depths, overlaps, and verticality are to be continuously measured, monitored and logged and the format for which this monitoring data is to be submitted to the Engineer.

B. Grout Mixing Plant:

1. The grout mixing plant shall include water tanks, pumps, valves, supply lines, electronic metering, proportioning (or weighing) equipment, a high shear mixer capable of producing a colloidal suspension of cement and additives in water, and other equipment as required to adequately supply grout to the mixing tool.

2. Monitor and record the density and viscosity of the grout as per the CQCP to verify grout proportion. Calibrate electronic weighing equipment to within 2 percent of a known weight at the beginning of the project and verified monthly thereafter.

3. Use positive displacement grout pumps to transfer the grout to the mixing equipment. The grout pumps shall be capable of pumping the required distance and elevations to provide an adequate quantity and pressure of grout to the mixing equipment.

4. Equip the grout plant to accept dry or liquid additives in measured amounts. The Contractor shall implement dust control measure during the delivery of dry reagents and additives.

5. Provide storage tanks to allow for an adequate supply of batches or continuously mixed grout to the mixing equipment. Agitate the grout until fully mixed and recirculate in the storage tanks to maintain a homogeneous mix and prevent flash set. Provide electronic grout meters or calibrated tanks to measure injection volumes.

6. Mixing vessels to be sealed or provide containment to mitigate fugitive dust during mixing operations.

C. In Situ Sampling Tool

1. In situ sampling tool will be used to obtain samples of the uncured, mixed soil at depth in the ISS column. The sampling tool shall consist of a weighted chamber that can be opened and closed from the surface to obtain mixed soil and grout. The sampling tool may be attached to the mixing equipment or supported by a second machine.

3.4 PROTECTION OF EXISTING STRUCTURES AND MONITORING

A. Comply with the requirements of Specification Section 01721 – Protection of Work and Property.

B. Protect existing structures on or near the site that are not explicitly identified for demolition or removal on the Construction Drawings.

C. “Pothole” subsurface utility lines prior to construction to positively identify location and depth.

D. Any damage to these structures or their foundations due to negligence shall be repaired to the satisfaction of Owner at the Contractor’s expense.

3.5 SUBGRADE PREPARATION

A. Prior to commencing ISS in a given area prepare the subgrade in accordance with the Construction Drawings and Specification Sections 01732 – Selective Demolition and 02315 – Excavation.

B. Remediate subsurface obstructions that were not removed in accordance with Subpart 3.8 of this Section.

C. Prepare the ground surface as necessary in order to establish a working platform suitable for use by ISS equipment.

3.6 TEST SECTION

A. Prior to production work, perform three test sections (i.e., nine ISS columns) to verify that the performance requirements can be met and confirm application parameters of the selected mix design(s) required for the means and methods proposed by the Contractor. Install the test sections using the same soil mixing equipment, methods, and grout to be used for production work.

B. Measure dry mass of reagents, water addition ratio, grout density, viscosity, injection ratio, mixing passes, penetration rate, and any other parameter necessary to demonstrate to the satisfaction of the Engineer that the design Reagent Addition Ratio is being achieved.

C. Test section locations will be agreed on between Engineer and Contractor.

D. A test section shall consist of three ISS columns or cells installed to the required depth at the selected location.

1. The test section shall include two primary columns/cells and one secondary column/cells that joins the primary columns at the specified overlap ratio.

    a. Allow the primary columns to cure for the minimum time specified in the Contractor's Construction Plan prior to installing the secondary column.

2. Test section is required for all methods and equipment used on the project.

    a. If major equipment components are repaired or replaced, a new test section will be required at no additional cost, unless otherwise directed by Engineer.

    b. Replacement of minor components and maintenance items replaced as part of normal wear and tear (e.g., bearings and seals) will not require a new test section.

E. Perform sampling, inspection, and testing of the test section.

1. Uniformity of Mix: Representative samples shall be collected to demonstrate uniformity of mix in accordance with Subpart 3.9 of this Section. Samples shall be collected at the rate of three samples per column, collected from the upper third, the middle third, and the bottom third of each column, as approved by the Engineer. The samples shall be inspected and assessed in accordance with Subpart 3.9 of this Section. Columns/cells that do not meet the performance criteria at Subpart

2.1 shall be immediately reworked.

2. UCS and Hydraulic Conductivity: Representative samples of wet, uncured mixed soil shall be collected from each test section at the rate of three samples per column/cell, collected from the upper third, the middle third, and the bottom third of each column, as approved by the Engineer. A minimum of four samples shall be collected from each interval (i.e., one each for UCS testing at 7 days and 28 days, and one each for hydraulic conductivity testing at 14 days and 28 days). The samples shall be tested and assessed in accordance with Subpart 3.9 of this Section. A test section shall be considered acceptable if the performance criteria for UCS of greater than or equal to 50 psi and the performance criteria for hydraulic conductivity of less than or equal to $1x10^{-6}$ cm/sec are met at either 14 days or 28 days for all columns and all intervals, unless otherwise approved by the Engineer.

3. Core Drilling of Treated Soils: The center and edge of each stabilized column shall be cored at locations as selected by the Engineer. Cores shall be collected continuously from the top to the bottom of the ISS column. Core recovery shall be a minimum of 85 percent. The Engineer shall inspect the cores from the top to the bottom of the ISS column to check for completeness of the ISS process, including break-up of the original soil matrix and uniformity of mixing of the grout with the soil. The Engineer shall inspect the cores for pockets of untreated soil and free NAPL in the completed matrix, as defined by pockets of untreated soil greater than 3 inches in diameter or pockets of free NAPL greater than ½-inch in diameter, unless otherwise approved by the Engineer. Following completion of each coring location, the borings will be filled with grout.

F. If a test section indicates that the requirements in Subpart 2.1 or Subpart 3.9 of this Section have not been achieved, propose revised ISS procedures for approval by the Engineer and re-perform the test section. If the test section is acceptable, the test section will be retained as part of the permanent work.

3.7 ISS CONSTRUCTION

A. Construct the treated area using the tested and approved method to the lines, grades, and cross sections shown on the Construction Drawings.

1. The ISS mixing shall consist of a pattern of overlapping columns and shall extend through the overburden to the depths indicated on the Construction Drawings.

2. ISS columns shall be vertical. Each time a column is initiated, the work platform and/or ISS equipment shall be leveled to plumb within a percent of vertical that is less than:

$$\frac{(overlap\ ratio\ x\ auger\ diameter)}{design\ depth\ of\ ISS\ column} x100\%$$

3. ISS Perimeter.

   a. The ISS perimeter shall follow the designed boundary within 1-foot of the line shown on the Construction Drawings. The ISS perimeter may vary from the designed alignment to accommodate equipment limitations if approved in writing by the Engineer.

   b. Construct the perimeter of the ISS structure first, prior to the interior ISS structure, to prevent mud wave and groundwater migration. The perimeter shall be constructed in a manner that precludes softening load bearing soils in the vicinity of existing structures at one time. Protect existing structures and active utility lines located along the ISS perimeter from damage.

   c. Submit as part of the IWP a plan for the ISS perimeter construction detailing the proposed column sequencing, number of rows, width of the perimeter ISS and setting time between columns.

4. A generalized description of the soil profile through which the ISS is to be constructed is provided on the Construction Drawings using cross sections. Additional subsurface information is available in the borehole and test pit logs found elsewhere in the Contract Documents.

5. Measured or survey the depth of the ISS columns to within 6-inches of the installed elevation. Measure the depth from the working platform surface to the bottom of the mixing tool using a method approved by the Engineer.

B. Soil Mixing

1. Mix and monitor each ISS column to ensure adequate mixing to meet the performance criteria at Subpart 2.1. Adjust the mixing rate to accommodate conditions based on the degree of mixing difficulty. Additional mixing may be required to evenly distribute the grout throughout the column pursuant to the Performance Criteria referenced in Subpart 2.1.

C. Injection Ratio

1. Monitor and record the grout injection ratio for each column and adjust as necessary for the field conditions encountered.

2. Calculate, on a form acceptable to the Engineer, the minimum injection ratio for each column based on the volume of unmixed soil in the column (whether primary

or secondary), the density of the soil, and the volume of grout required to achieve the Reagent Addition Ratio

3. Verify the flow of grout prior to each pass. Clear any blockage in the mixing auger prior to injection and mixing.

4. Calculate and check the injection and reagent addition ratios for each ISS column. Correct the injection ratio for previous overlaps in the same column. In all cases, the minimum injection ratio to satisfy the design reagent addition ratio shall be observed. There shall be no maximum injection ratio.

D. Column Orientation and Overlap Ratio

1. Stagger adjacent rows of columns such that the center of the columns in even rows are aligned with the intersection of the columns in the odd rows.

2. The minimum overlap ratio for any size column shall be 15 percent (distance at max overlap/diameter of column). Overlap columns such that no void spaces occur between columns.

3. Locate and survey the ISS pattern of overlaps to ensure that the overlap ratio is constructed as required by the Contract Documents.

E. Spoils and Swell Materials Management

1. Manage excess materials resulting from the ISS treatment. Owner shall not be responsible for retreatment or removal of spoils and swell materials that are improperly managed.

2. Remove spoils and swell materials from the site as necessary to achieve the final design grades shown in the Construction Drawings.

3. Excess spoils shall be disposed of in accordance with Specification Section 02120 – Off-Site Transport and Disposal.

D. Rework

1. If QC testing for any area does not meet the requirements of this Section, the area shall be reworked. Area and approach for rework shall be agreed to in writing between Owner, Engineer, and Contractor prior to commencing. The rework would be performed at no additional expense to Owner.

3.8 OBSTRUCTIONS

A. If obstructions including boulders, timbers, foundations, bedrock, or other potentially damaging materials are encountered, the Soil Mixing Specialist shall stop drilling until the nature of the obstruction is known.

1. Remediate obstructions that cannot be penetrated by auger mixing equipment by removal or other means acceptable to the Engineer. The method selected for remediation of obstructions will depend on obstruction depth, location, and other pertinent site conditions (refer to the ISS Method Selection Flow Chart - Section 2.3 of the Remedial design Report).

3.9 QUALITY CONTROL

A. QC testing requirements are summarized below.

1. ISS Continuity and Depth

a. Demonstrate to the satisfaction of the Engineer that the Work is continuous, and the minimum specified depths have been achieved in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

b. Ensure ISS continuity by an overlapping pattern of the ISS columns constructed in accordance with the specifications.

c. The Engineer will be on-site to verify these measurements.

2. Materials

a. Permanent materials imported to the site shall be certified by the manufacturer to comply with the specified standard. Submit Certificates of Compliance with the Specification for each material imported.

3. Grout

a. Conduct grout density testing at the mixer or holding tank containing fresh grout ready for injection into the soil.

b. Continuously maintain at the batch plant a record of the weight of each material, volume of water, and the corresponding date and time.

c. Collect samples of grout for testing in accordance with the Contractor's Quality Control Plan and test in accordance with ASTM C109.

4. Stabilized Soil Material (to be performed by the Engineer)

   a. Assist the Engineer in obtaining wet samples of the stabilized soil with the in situ wet sampler (e.g. steel casing sampler with a hydraulically controlled opening/closing bucket) at random depths from surface to bedrock, formed into test cylinders, cured, and tested. Screen off particles larger than 10% of the test cylinder diameter.

   b. Make a series of cylinders once every day or once every 500 cubic yards of treated in situ soil, whichever produces the greater number of tests. Cast cylinders in pairs for each sample location and each test interval (total of ten cylinders per test).

   c. Test the stabilized soil cylinder pairs at 1, and 28 days after forming, with one pair reserved for testing at 56 days if the 28-day test pair does not pass. The stabilized soil shall meet the requirements specified in Subpart 2.7 of this specification section.

5. Documentation

   a. Document quality control records, tests, and inspections and make available for review by the Engineer. Record measurements and test results and submit to the Engineer each day.

B. At a minimum, provide the following documentation and/or perform the following quality control testing. Documentation and test results shall be provided to the Engineer within the time frames indicated below.

1. Materials: Provide the following 30 days prior to initiation of ISS operations:

   a. Source of imported materials Portland cement, GGBFS, drilling fluids, and any additives.

   b. Certificates of compliance and/or or certified test results verifying that the materials meet requirements specified herein.

2. Water: Provide the following 30 days prior to initiation of ISS operations:

   a. Source. From a potable water source.

3. Grout:

   a. Continuously maintain a record, by date and time, of the materials used to blend grout, including the weight of each material and volume of water

used. Include in this record keeping the grout flow rate from the grout mixing plant.

b. Conduct grout density and viscosity testing at the mixer or holding tank containing fresh grout ready for injection into the soil, as follows:

1) Density testing in accordance with ASTM D4380, at a minimum frequency of one test per four hours of mixing plant operation.

2) Viscosity testing in accordance with ASTM D6910, at a minimum frequency of one test per four hours of mixing plant operation.

4. ISS Depth and Area:

a. Demonstrate to the satisfaction of the Engineer that the Bottom of Column Elevations and complete coverage of the ISS Area have been achieved in accordance with the Construction Drawings and this Section.

b. Demonstrate to the satisfaction of the Engineer ISS continuity by an overlapping pattern of the ISS columns has been constructed in accordance with the Construction Drawings and this Section.

5. Reagent Addition Ratio: For each ISS Column, measure and document injection ratio, auger penetration rate, auger extraction rate, and any other properties necessary to demonstrate to the satisfaction of the Engineer that the Reagent Addition Ratio has been satisfied.

6. Uniformity of Mix: Collect samples of the wet, uncured mixed soil to demonstrate uniformity of mix in compliance with Subpart 2.1 of this Section. Collect three wet samples once every day or once every 500 cubic yards of treated in situ soil, whichever produces the greater number of tests, from the upper third, the middle third, and the bottom third of one column. Photograph the samples to create a record and present the samples to the Engineer for inspection.

7. UCS and Hydraulic Conductivity (Batch Testing) of wet, uncured mixed soil: Collect samples and perform UCS and hydraulic conductivity testing to demonstrate compliance with Subpart 2.1 of this Section as follows:

a. Representative samples of the wet, uncured mixed soil shall be collected with the in-situ sampler at depths from the upper third, the middle third, and the bottom third of one column, as proposed by the Contractor and approved by the Engineer.

b. Wet samples shall be collected once every day or once every 500 cubic

yards of treated in situ soil, whichever produces the greater number of tests. After 10,000 cy of material has been successfully treated, the required frequency may be reduced to once every other day or once every 1,000 cy of treated in situ soil, whichever occurs produces the greatest number of tests, subject to the approval of the Engineer.

c. At each sample location, the wet sample volume shall be sufficient to fill a minimum of six (6) cylinders for testing, a minimum of four (4) cylinders as spares, and cylinders as required for QA testing as indicated in Subpart 3.10. Cylinders shall have dimensions as indicated by ASTM 1633 (Method A). Particles larger than 10% of the test cylinder diameter shall be screened off prior to filling the cylinders.

d. UCS: A minimum of four (4) cylinders shall be allocated for curing and testing in accordance with ASTM D1633 (Method A). Two cylinders shall be tested after 7 and 28 days of curing, respectively. If the UCS of both 7-day tests meet the strength specified in Subpart 2.1, then the 28-day test is not required.

e. Hydraulic Conductivity: A minimum of two (2) cylinders shall be allocated for curing and testing in accordance with ASTM D 5084 (Method E). One (1) cylinder shall be tested after curing for 14 days. If the hydraulic conductivity of the 14-day test satisfies the criteria specified in Subpart 2.1, no additional testing need be performed. If the hydraulic conductivity of the14-day test fails to meet the criteria specified in Subpart 2.1, then the second cylinder shall be tested following 28 days of curing.

f. Based on observed curing trends and in consultation with the Engineer, the Contractor may propose, at its own expense, additional samples at an accelerated schedule to demonstrate compliance with the performance criteria at Subpart 2.1, subject to the approval of and at the discretion of the NYSDEC.

8. Core Drilling of Treated Soils:

a. To provide visual verification of homogenization, pursuant to the Uniformity of Mix Performance Criteria, conduct core drilling of treated soils at locations selected by the Engineer. Cores shall be collected continuously from the top to the bottom of the ISS column.

b. Cores shall be collected no earlier than 7 days and no later than 14 days after treatment.

c. Cores shall be collected at a frequency of one core per 1,000 square feet of treated area. Coring locations will be biased toward perimeter ISS areas, where difficulties in the ISS process were encountered and/or in locations identified with the greatest soil contamination.

d. Core recovery shall be a minimum of 85%. The Engineer shall inspect the cores from the top to the bottom of the ISS column to check for completeness of the ISS process, including break-up of the original soil matrix and uniformity of mixing of the grout with the soil. The Engineer shall also inspect the cores for pockets of untreated soil and free NAPL in the completed matrix, as defined by pockets of untreated soil greater than 3 inches in diameter or pockets of free NAPL greater than ½-inch in diameter, unless otherwise approved by the NYSDEC.

e. Following completion of each coring location, the borings will be filled with grout.

9. Documentation

a. Document quality control records, tests, and inspections and make available for review by the Engineer. Record measurements and test results and submit to the Engineer each day in accordance with Subpart 1.4 of this Section.

3.10 QUALITY ASSURANCE SUPPORT

A. As requested, collect duplicate samples of any collected quality control sample, for quality assurance testing by the Engineer.

3.11 CLEANUP OF ISS CONSTRUCTION AREA

A. Upon completion of the ISS construction, level remaining grout and ISS spoils and construct surface that is 5 feet below the final grades shown on the Construction Drawings to allow construction of site cover system or as directed by the Engineer.

END OF SECTION 02160

SECTION 02161

IN-SITU STABILIZATION/SOLIDIFICATION USING EXCAVATOR-BASED MIXING

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the minimum requirements for in-situ stabilization/solidification (ISS) and related work as shown on the Construction Drawings and as hereinafter specified.

B. The work consists of furnishing labor, equipment, materials, supervision, transportation, and incidentals necessary to complete the work; and performing all operations as required to construct the ISS treated areas.

C. Removal of subsurface features including existing facilities, utilities, foundations, and remnant structures encountered during the Work.

1.2 DEFINITIONS

A. Bedrock refusal: A condition that occurs during mixing when the excavator-based equipment has reached its advancement limit at or near the anticipated depth of bedrock (as agreed upon by the Owner and/or Engineer) and can no longer be advanced. Defined as less than 6 vertical inches of penetration after 3 attempts, or as determined by the Owner and/or Engineer based on an evaluation of equipment operation data and field data.

B. Debris: Solid material exceeding a 3-inch particle size. Debris includes, but is not limited to, manmade material identified within the Work Area that may include, but is not limited to, concrete, asphalt, pilings, brick, plastics, rubber, tires, wire, cable, metal, anchors, trash, monitoring well materials, and other miscellaneous materials. Further, some naturally occurring materials, such as timber logs, tree stumps, branches, and loose pieces of wood that may interfere with ISS or removal activities are considered debris. Riprap, boulders and/or cobble are not considered debris.

C. Grout: A stable colloidal suspension of powdered materials which may include reagents (e.g., Type I/II Portland cement, Ground Granulated Blast-Furnace Slag [GGBFS]), additives, and/or other similar materials in water.

D. Homogeneous Mixture: A uniform, unvarying, and consistent blend of impacted soil, grout, and liquids, free from NAPL blebs and free from pockets of unmixed materials and free liquids.

E. Injection Ratio: A volumetric ratio of grout to soil (e.g., 100 gallons per cubic yard) to be mixed. The injection ratio is determined based on the ISS area, soil density, pattern of treatment, and target Reagent Addition Ratio.

F. ISS: A soil improvement technique used to construct in situ soil structures or treat soils in place, without excavation or dewatering. In this section, the ISS mixing type includes excavator-based mixing. Stabilized soil cells are created that may be joined together by overlapping cells to form a large, treated volume of soil.

G. ISS Area: The portion of the Site requiring ISS treatment as shown on the Construction Drawings.

H. ISS Cell: An area of the site that has received the addition of grout and has been thoroughly mixed to create a homogenous unit of solidified soil extending from the top surface down to the target depth.

I. ISS Spoils: The excess material resulting from adding grout to the in-situ soils. The spoils are typically a mixture of soil and grout similar to the materials in the ISS cell.

J. Mixing: Operation of the mixing equipment in lifts of 1 to 2 feet from the top of the ISS cell to the bottom and from the cell interior to the cell perimeter. Once the design depth is achieved, the cell is to be thoroughly mixed to the cell limits (horizontal and vertical) until a consistent homogeneous mixture is achieved.

K. Obstructions: Subsurface man-made or natural object that impedes mixing advancement to the specified design/target depth. The determination of what constitutes an obstruction will be made in the field by the Owner and/or the Engineer based on field data. Information related to known debris, structures and utilities are included in the Contract Documents.

L. Reagent Addition Ratio: A weight-based ratio of dry grout reagents to in-situ soil total wet weight (e.g., 10% addition rate = 10 pounds dry grout reagents per 100 pounds wet soil) to be mixed in an ISS cell. The reagent addition ratio shall be tested and evaluated as part of the start-up phase. The reagent addition ratio may be evaluated and determined for each cell based on soil density and characteristics, water table elevation, pattern of treatment, and other site conditions. Reagent addition ratios used during full-scale implementation shall be tested and evaluated as part of start-up phase. Assume a wet soil weight of 130 pounds per cubic foot, unless otherwise approved by the Engineer.

M. Obstruction Refusal: A condition that occurs during mixing when the excavator-based equipment can no longer be advanced at a depth less than what is anticipated for bedrock (as agreed upon by the Owner and/or Engineer) and can no longer be advanced either due to encountering obstructions or soil geotechnical properties. Defined as failure to advance greater than 6 vertical inches after three attempts, or as determined by the Engineer.

N. Swell: The excess material resulting from volumetric expansion during grout addition to the in-situ soils. The swell is typically a mixture of soil and grout similar to the materials in the ISS area.

O. Unsatisfactory Materials: Materials brought to the Site that do not comply with the requirements for reagents listed in PART 2, PRODUCTS of this Section. Unsatisfactory materials include, but are not limited to, those materials containing roots and other organic matter, trash (i.e., refuse), debris, contaminated materials, frozen materials, or reagents that have become wet either prior to or after arriving at the site and before being mixed for use.

P. Water Addition Ratio: A weight-based ratio of water to dry grout reagents (e.g., a 1:1 ratio = 1 pound water to 1-pound dry grout reagents) used to produce the grout. The water addition rates shall be proposed by the Contractor and tested and evaluated as part of the start-up phase.

Q. Working Platform: The leveled surface of stable soils from which the ISS equipment operates.

1.3 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only and shall be the latest published revision.

1. American Society for Testing and Materials (ASTM) publications:

a. C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

b. C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars Using 2-in Cube Specimens

c. C150: Standard Specification for Portland Cement

d. C494: Standard Specification for Chemical Admixtures for Concrete

e. C989: Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

f. C1017: Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

g. D1633/D1623 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders

h. D2166: Standard Test Method for Unconfined Compressive Strength (UCS) of Cohesive Soil

i. D4832: Standard Test Method for Preparation and Testing of Controlled Low strength Materials (CLSM) test Cylinders; and

j. D5084: Standard Test Method for Measurement of Hydraulic Conductivity of saturated Porous Materials.

k. D6910: Standard Test Method for Marsh Funnel Viscosity of Construction Slurries

2. American Petroleum Institute (API) Publications:

a. Spec 13A: API Specification for Oil-Well Drilling Fluid Materials; and

b. RP 13B-1: API Recommended Practice Standard Procedure for Field Testing Water-Based Drilling Fluids.

1.4 SUBMITTALS

A. Qualifications of Contractor.

1. Submit evidence that the Contractor or its Subcontractor is experienced and competent to construct the project in subsurface conditions similar to those expected at the site. The evidence shall include references from at least five similar and successful projects constructed over the last 10 years. At least two of the projects shall include soil mixing adjacent to critical structures (e.g., buildings, road, towers, subsurface piping, electrical, and other such infrastructure) where prevention of settlement and mitigation of vibration were key elements of the project. Project descriptions shall include, at a minimum, the dimensions of work, type of grout, and equipment used. Projects descriptions shall include, at a minimum, the dimensions of work, type of grout, and equipment used.

2. Soil Mixing Specialist: A Soil Mixing Specialist shall supervise the construction, grout preparation, mixing, and quality control. The Soil Mixing Specialist shall have at least ten years of experience and five projects in the successful construction of soil mixing projects, including at least five years of experience utilizing excavator-based mixing. At least two of the projects shall include soil mixing adjacent to critical structures where settlement and mitigation of vibration were key elements of the project. The Soil Mixing Specialist shall be present during soil mixing operations and shall not be assigned dual functions as Project Superintendent or Contractor Quality Control staff. This individual shall be knowledgeable of:

a. Proper mixing methods employed to mix, control, and test grout;

b. ISS construction equipment and tools;

c. In situ mixing injection ratios, overlaps, and overlap ratios; and

d. ISS quality control testing in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

3. Submit company name, key contact, and qualifications of the Contractor's off-site laboratory. The laboratory shall have previous experience with soil mixed materials, experienced laboratory technicians, and modern laboratory testing equipment.

B. ISS Work Plan

1. Submit a detailed ISS Work Plan (IWP) describing the proposed construction equipment, procedures, and schedules for the ISS treatment as part of the overall Construction Work Plan (CWP). This shall include, but not be limited to:

a. A listing of supervisory personnel including the name and experience of the various persons, their role, and primary responsibilities.

b. Equipment set-up and site use layout including storage areas, grout mixing plant location, haul routes, and work platform.

c. Soil mixing equipment and reagent metering specifications, including maximum depth capability and capacity of the grout mixing plant.

d. Construction means and methods including a listing of construction steps; handling of excess grout and spoils; layout; overlap control; and control of drainage, spills, and wastes. Contractor should take into consideration known debris/obstructions at the Site and presence of residual NAPL in proposed ISS area as indicated in the Contract Documents

e. Layout drawing showing the geometry, overlaps, volume and dimensions of the cell overlapping pattern. The proposed ISS layout shall consider daily anticipated production rates, varying subsurface conditions across the site, overlaps to previously installed ISS columns/cells and overall column/cell mixing time to minimize re-molding of grout-soil mixing during initial curing. The proposed ISS cell layout shall show the center point of each cell and/or the corner points of each cell including the overlap between adjacent cells. The proposed ISS cell layout shall include a table with point coordinates.

f. ISS quality control procedures describing all testing, sampling, reporting forms, methods, responsible persons, non-conformance procedures, the NYSDEC's In-Situ Solidification QA/QC technical guidance, and all other means to ensure the quality of the work.

g. Schedule: A Gantt chart schedule in Microsoft Project or Primavera P6 showing all major activities and durations.

C. Source of all materials, including mix water, reagents (Portland cement, ground granulated blast furnace slag [GGBFS]) and any additives. Submit certificates of compliance and/or certified test results verifying that the materials meet the requirements specified herein.

D. Submit the following items to the Engineer during the work:

1. Accurate daily records of the work, including a daily report indicating:

a. ISS mixing method, reagent metering, and equipment used

b. Cell identification with sketch identifying completed areas

c. Volume of soil stabilized and running total.

d. ISS Cell Log for each cell stabilized, including:

1) Date

2) Cell identification and location

3) Cell dimensions

4) Design and actual top of cell elevation

5) Design and actual bottom of cell elevation

6) Estimated depth of key-in to bedrock subgrade if applicable

7) Cell start time

8) Cell time at bottom

9) Cell finish time

10) Number of mixing passes

11) Cell mixing duration

12) Cell grout mix details, including quantities of reagents used (lbs), additives used (lbs), and water used (gal).

13) Grout injection ratio

14) Cell neat volume (cy)

15) Total volume of grout injected (gal)

16) Notes on the appearance of the mixed material

17) Obstructions encountered

18) Unforeseen site conditions or equipment problems that affected ISS efforts

19) Any modifications or deviations from the Contract Documents or IWP. All modifications must be approved by the Engineer prior to implementation.

20) QC testing conducted including sample location, depth, type and number.

21) Weather

22) Air monitoring and mitigation measures

e. Material inventory, including quantities of grout reagents received and offloaded, used, and in storage.

f. Spoils and swell handling / management, including quantities disposed off-site.

g. Other pertinent observations

2. The results of QC tests as required by this Section.

3. Any change in the predetermined soil mixing program necessitated by a change in the subsurface conditions. All such changes must be approved by the Engineer prior to implementation.

E. As-Built Drawings. Within 30 days of completion of the Work, submit to the Engineer as-built drawings showing ISS Cell identification numbers, locations (Northings, Eastings), and as-built top and bottom cell elevations. This will include rendered CADD surface files as well as point files for the installed cells.

F. Comply with the Contractor's Quality Control Plan (CQCP) and maintain a quality control program for the ISS construction.

1.5 RESTRICTIONS

A. Obtain any state and municipal permits (if required) and conform to all state and local regulations.

B. The Construction Drawings showing approximate locations of known utilities. The Contractor will be responsible for the precise delineation and protection of all above and below ground utilities at the Site.

C. Environmental Restrictions

1. Contractor shall be responsible for any and all hazardous materials brought on-site (fuel, oil, etc.) and shall notify Owner and provide MSDS sheets for any such materials. All materials brought on-site by Contractor shall be the sole responsibility of Contractor, including proper disposal or clean-up of any spills.

2. Control of any water or fluids produced is the responsibility of Contractor.

3. Any environmental violations, including penalties or fines, that may occur on-site as a result of Contractor's actions are the responsibility of Contractor.

D. Working Hours Restrictions

1. Provide a schedule of working hours for review by Engineer in accordance with Specification Section 01140 – Work Restrictions.

E. Noise Restrictions

1. Local noise ordinances will need to be observed and any violations or complaints will be addressed and resolved by Contractor.

F. Dust, Vapor, and Odor Restrictions

1. Control of nuisance dust, vapor, and odors resulting from the Work is the responsibility of Contractor.

2. Comply with the Community Air Monitoring Plan (CAMP) requirements provided in the Remedial Design Report.

PART 2 – PRODUCTS

2.1 GROUT

A. Performance Criteria:

1. The material formed by mixing the grout with the in-situ soil shall meet the following

minimum requirements:

Property	Requirement	ASTM Test Method
UCS	Greater than or equal to 50 psi at 28 days	D2166
Hydraulic Conductivity	Less than or equal to $1x10^{-6}$ cm/sec at 28 days	D5084

a. The UCS criteria shall be met for a daily or 500-cy batch testing as described in Subpart 3.9.

b. The hydraulic conductivity criteria shall be met for a daily or 500-cy batch testing as described in Subpart 3.9.

2. Uniformity of Mix: Reagents shall be mixed uniformly throughout each pass and consistent mixing energy shall be applied to result in a uniform and homogeneous mixture, as defined by the following criteria and as determined by the Engineer:

a. No visible non-aqueous phase liquids (NAPL) or sheen.

b. Reagent and soil are thoroughly intermixed, with uniform and consistent color, soil graduation, moisture content, and consistency.

c. There are no unmixed pieces of soil greater than 3 inches in maximum dimension.

d. Cells that do not meet these criteria, as assessed by sampling as described in Subpart 3.9, shall be immediately addressed by the Contractor.

B. Grout shall be pumpable and workable with the mixing equipment, as appropriate.

C. Based on the results of the Bench Scale Treatability Study Report (Geo-Solutions 2023), ISS grout mixes that may be used for the Work consist of the following mixes:

Mix ID	Reagent Addition (% by wet soil weight)		W:C	Grout: Soil*
	Portland cement	GGBFS		
M-1-1	2	4	2.00	-

M-1-2	3	6	1.50	-

2.2 REAGENTS

A. Portland cement: Portland cement used in preparing grout shall conform to ASTM C150 Type IL. Portland cement shall be protected from moisture and contamination in storage on the jobsite. Reclaimed cement or cement containing lumps or deleterious matter shall not be used.

B. GGBFS: GGBFS used in preparing grout shall conform to ASTM C989 Grade 100. GGBFS shall be protected from moisture and contamination while in storage at the Site.

C. Provide means for measuring dry reagents for grout mixing. Measuring devices shall include electronic sales and calibrated to within ± 2% by weight. Provide documentation for the calibration. Measuring devices shall be calibrated per the manufacturer's recommendation and, at a minimum monthly.

2.3 WATER

A. Water used in preparing grout shall be potable water from an Engineer-approved source. It is the responsibility of the Contractor that the grout resulting from the water used shall always meet the requirements of this Section.

B. Provide a backflow preventor for all water services. Obtain permits, arrange for temporary connection to water service, and pay fees for water usage.

C. Provide means for measuring water for grout mixing. Measuring devices shall measure total and instantaneous flows and shall be calibrated to within ± 2 percent to accurately measure the water for each batch. Provide documentation for the calibration. Measuring devices shall be calibrated per the manufacturer's recommendation and, at a minimum monthly.

2.4 ADMIXTURES

A. Admixtures may be used to enhance the workability or final properties of the treated soil. Additives may be added to the water or the grout. Admixtures shall conform to ASTM C494. Flowing concrete admixtures shall conform to ASTM C 1017, Type I. Proprietary chemicals may be approved based on the results of pre-construction testing or other information provided by the Contractor at its expense. The Engineer shall approve proposed additives to be used.

2.5 MATERIAL MANAGEMENT

A. Protect containers and locations for material storage from precipitation, moisture, and other potential deleterious effects.

B. Ensure that containers for material storage are properly labeled in accordance with 29 CFR 1910.1200 - Hazard Communication.

C. Maintain onsite Safety Data Sheets (SDSs) for materials stored or used.

D. Control dust during offloading, storage, transportation, and mixing of reagents, in accordance with Specification Section 01110 - Environmental Protection Procedures.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

A. Employ the use of excavator-based mixing equipment. When excavator- based mixing equipment is used and subsurface obstructions are encountered that prevent the excavator-based mixing equipment from penetrating to the specified depth, the location and depth penetrated by the excavator-based mixing equipment shall be identified and marked. Remediate obstructions in accordance with Subpart 3.8 of this Specification Section.

B. Install soil erosion and sediment control devices prior to any major soil disturbance and maintain until permanent protection is established in accordance with Specification Section 01110 – Environmental Protection Procedures.

C. Prior to any subsurface work, notify federal, state, and local officials as required by law of subsurface work to be performed. Locate and clearly mark utility lines prior to performing earthwork.

D. ISS construction shall not be performed when the air temperature is below 20 degrees Fahrenheit or when severe weather conditions may compromise the quality of safety of the work unless approved by Owner and/or Engineer and provided that proper cold weather provisions and measures proposed by the Contractor are previously approved.

E. Equipment and tools used by the Contractor to perform the work will be subject to inspection by the Engineer before the work is started and shall be maintained in satisfactory working condition at all times. Provide equipment adequate for and have the capability of producing the indicated ISS results specified herein.

F. Comply with applicable noise regulations and ordinances.

G. Remnant foundations and other subsurface obstructions should be at this Site. All obstructions shall be removed by the Contractor as necessary to facilitate ISS operations. The Engineer shall be notified immediately if an unanticipated obstruction is encountered that is preventing ISS advancement and requires removal.

3.2 SURVEYING

A. Conduct surveys in accordance with the requirements of Specification Section 01050 – Surveying.

3.3 EQUIPMENT

A. Equipment shall be of a type and capacity suitable for achieving the mixing depths and at the rates required to construct the ISS areas as shown on Construction Drawings.

B. Grout Mixing Plant:

1. The grout mixing plant shall include water tanks, pumps, valves, supply lines, electronic metering, proportioning (or weighing) equipment, a high shear mixer capable of producing a colloidal suspension of cement and additives in water, and other equipment as required to adequately supply grout to the mixing tool.

2. Monitor and record the density and viscosity of the grout as per the CQCP to verify grout proportion. Calibrate electronic weighing equipment to within 2 percent of a known weight at the beginning of the project and verified monthly thereafter.

3. Use positive displacement grout pumps to transfer the grout to the mixing equipment. The grout pumps shall be capable of pumping the required distance and elevations to provide an adequate quantity and pressure of grout to the mixing equipment.

4. Equip the grout plant to accept dry or liquid additives in measured amounts. The Contractor shall implement dust control measure during the delivery of dry reagents and additives.

5. Provide storage tanks or ponds to allow for an adequate supply of batches or continuously mixed grout to the mixing equipment. Agitate the grout until fully mixed and recirculate in the storage tanks to maintain a homogeneous mix and prevent flash set. Provide electronic grout meters or calibrated tanks to measure injection volumes.

C. In Situ Sampling Tool

1. In situ sampling tool will be used to obtain samples of the uncured, mixed soil at depth in the ISS cell. The sampling tool shall consist of a weighted chamber that can be opened and closed from the surface to obtain mixed soil and grout. The

sampling tool may be attached to the mixing equipment or supported by a second machine.

3.4 PROTECTION OF EXISTING STRUCTURES AND MONITORING

A. Comply with the requirements of Specification Section 01721 – Protection of Work and Property and Section 13091 – Structural Monitoring.

B. Protect existing structures on or near the site that are not explicitly identified for demolition or removal on the Construction Drawings.

C. "Pothole" subsurface utility lines prior to construction to positively identify location and depth.

D. Any damage to these structures or their foundations due to negligence shall be repaired to the satisfaction of Owner at the Contractor's expense.

3.5 SUBGRADE PREPARATION

A. Prior to commencing ISS in a given area and in accordance with the Construction Drawings and Specification Sections 01732 – Selective Demolition and 02315 – Excavation.

B. Remediate subsurface obstructions that were not removed in accordance with Subpart 3.7 of this Section.

C. Prepare the ground surface as necessary in order to establish a working platform suitable for use by ISS equipment.

3.6 TEST SECTION

A. Prior to production work, perform three test sections to verify that the performance requirements can be met and confirm application parameters of the selected mix design(s) required for the means and methods proposed by the Contractor. Install the test sections using the same soil mixing equipment, methods, and grout to be used for production work.

B. Measure dry mass of reagents, water addition ratio, grout density, viscosity, injection ratio, mixing passes, penetration rate, and any other parameter necessary to demonstrate to the satisfaction of the Engineer that the design Reagent Addition Ratio is being achieved.

C. Test section locations will be agreed on between Engineer and Contractor.

D. A test section shall consist of three ISS cells installed to the required depth at the selected location.

1. The test section shall include two primary cells and one secondary cell that joins the primary cell at the specified overlap ratio.

a. Allow the primary cells to cure for the minimum time specified in the IWP prior to installing the secondary cell.

2. Test section is required for all methods and equipment used on the project.

a. If major equipment components are repaired or replaced, a new test section will be required at no additional cost, unless otherwise directed by Engineer.

b. Replacement of minor components and maintenance items replaced as part of normal wear and tear (e.g., bearings and seals) will not require a new test section.

E. Perform sampling, inspection, and testing of the test section.

1. Uniformity of Mix: Representative samples shall be collected to demonstrate uniformity of mix in accordance with Subpart 3.9 of this Section. Samples shall be collected at the rate of three samples per cell, collected from the upper third, the middle third, and the bottom third of each, as approved by the Engineer. The samples shall be inspected and assessed in accordance with Subpart 3.9 of this Section. Columns/cells that do not meet the performance criteria of Subpart 2.1 shall be immediately reworked.

2. UCS and Hydraulic Conductivity: Representative samples of wet, uncured mixed soil shall be collected from each test section at the rate of three samples per column/cell, collected from the upper third, the middle third, and the bottom third of each, as approved by the Engineer. A minimum of four samples shall be collected from each interval (i.e., one each for UCS testing at 7 days and 28 days, and one each for hydraulic conductivity testing at 14 days and 28 days). The samples shall be tested and assessed in accordance with Subpart 3.9 of this Section. A test section shall be considered acceptable if the performance criteria for UCS of greater than or equal to 50 psi and the performance criteria for hydraulic conductivity of less than or equal to $1x10^{-6}$ cm/sec are met at either 14 days or 28 days for all cells and all intervals, unless otherwise approved by the Engineer.

3. Core Drilling of Treated Soils: The center and edge of each stabilized cell shall be cored at locations as selected by the Engineer. Cores shall be collected continuously from the top to the bottom of the ISS cell. Core recovery shall be a minimum of 85 percent. The Engineer shall inspect the cores from the top to the bottom of the ISS cell to check for completeness of the ISS process, including break-up of the original soil matrix and uniformity of mixing of the grout with the soil. The Engineer shall inspect the cores for pockets of untreated soil and free NAPL in the completed matrix, as defined by pockets of untreated soil greater than 3 inches in diameter or pockets of free NAPL greater than ½-inch in diameter,

unless otherwise approved by the Engineer. Following completion of each coring location, the borings will be filled with grout.

F. If a test section indicates that the requirements in Subpart 2.1 or Subpart 3.9 of this Section have not been achieved, propose revised ISS procedures for approval by the Engineer and re-perform the test section. If the test section is acceptable, the test section will be retained as part of the permanent work.

3.7 ISS CONSTRUCTION

A. Construct the treated area using the tested and approved method to the lines, grades, and cross sections shown on the Construction Drawings.

1. The ISS mixing shall consist of a pattern of overlapping cells and shall extend through the overburden to the depths indicated on the Construction Drawings.

2. ISS Perimeter.

a. The ISS perimeter shall follow the designed boundary within 1-foot of the line shown on the Construction Drawings. The ISS perimeter may vary from the designed alignment to accommodate equipment limitations if approved in writing by the Engineer.

b. Construct the perimeter of the ISS structure first, prior to the interior ISS structure, to prevent mud wave and groundwater migration. The perimeter shall be constructed in a manner that precludes softening load bearing soils in the vicinity of existing structures at one time. Protect existing structures and active utility lines located along the ISS perimeter from damage.

c. Submit as part of the IWP a plan for the ISS perimeter construction detailing the proposed cell sequencing, number of rows, width of the perimeter ISS and setting time between cells.

4. A generalized description of the soil profile through which the ISS is to be constructed is provided on the Construction Drawings using cross sections. Additional subsurface information is available in the borehole and test pit logs found elsewhere in the Contract Documents.

5. Measured or survey the depth of the ISS cells to within 6-inches of the installed elevation. Measure the depth from the working platform surface to the bottom of the mixing tool using a method approved by the Engineer.

B. Soil Mixing

1. Mix and monitor each ISS cell to ensure adequate mixing to meet the performance criteria at Subpart 2.1. Adjust the mixing rate to accommodate conditions based on the degree of mixing difficulty. Additional mixing may be required to evenly distribute the grout throughout the cell pursuant to the Performance Criteria referenced in Subpart 2.1.

C. Injection Ratio

1. Monitor and record the grout injection ratio for each cell and adjust as necessary for the field conditions encountered.

2. Calculate, on a form acceptable to the Engineer, the minimum injection ratio for each cell based on the volume of unmixed soil in the cell (whether primary or secondary), the density of the soil, and the volume of grout required to achieve the Reagent Addition Ratio

3. Verify the flow of grout prior to each pass. Clear any blockage in the mixing equipment prior to injection and mixing.

4. Calculate and check the injection and reagent addition ratios for each ISS cell. Correct the injection ratio for previous overlaps in the same cell. In all cases, the minimum injection ratio to satisfy the design reagent addition ratio shall be observed. There shall be no maximum injection ratio.

D. Cell Orientation and Overlap Ratio

1.2. The minimum overlap ratio for any size cell shall be 3 feet minimum (distance at max overlap of cell). Overlap cells such that no void spaces occur between cells.

3. Stake and survey the ISS pattern of overlaps to ensure that the overlap ratio is constructed as required by the Contract Documents.

E. Spoils and Swell Materials Management

1. Manage excess materials resulting from the ISS treatment. Owner shall not be responsible for retreatment or removal of spoils and swell materials that are improperly managed.

2. Remove spoils and swell materials from the site as necessary to achieve the final design grades shown in the Construction Drawings.

3. Excess spoils shall be disposed of in accordance with Specification Section 02120 – Off-Site Transport and Disposal.

D. Rework

1. If QC testing for any area does not meet the requirements of this Section, the area shall be reworked. Area and approach for rework shall be agreed to in writing between Owner, Engineer, and Contractor prior to commencing. The rework would be performed at no additional expense to Owner.

3.8 OBSTRUCTIONS

A. If obstructions including boulders, timbers, foundations, bedrock, or other potentially damaging materials are encountered, the Soil Mixing Specialist shall stop mixing until the nature of the obstruction is known.

1. Remediate obstructions that cannot be penetrated by excavator-based mixing equipment by removal or other means acceptable to the Engineer. The method selected for remediation of obstructions will depend on obstruction depth, location, and other pertinent site conditions (refer to the ISS Method Selection Flow Chart - Section 2.3 of the Remedial design Report).

3.9 QUALITY CONTROL

A. QC testing requirements are summarized below.

1. ISS Continuity and Depth

a. Demonstrate to the satisfaction of the Engineer that the Work is continuous, and the minimum specified depths have been achieved in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

b. Ensure ISS continuity by an overlapping pattern of the ISS cells constructed in accordance with the specifications.

c. The Engineer will be on-site to verify these measurements.

2. Materials

a. Permanent materials imported to the site shall be certified by the manufacturer to comply with the specified standard. Submit Certificates of Compliance with the Specification for each material imported.

3. Grout

a. Conduct grout density testing at the mixer or holding tank containing fresh grout ready for injection into the soil.

b. Continuously maintain at the batch plant a record of the weight of each material, volume of water, and the corresponding date and time.

c. Collect samples of grout for testing in accordance with the Contractor's Quality Control Plan and test in accordance with ASTM C109.

4. Stabilized Soil Material (to be performed by the Engineer)

a. Assist the Engineer in obtaining wet samples of the stabilized soil with the in situ wet sampler (e.g. steel casing sampler with a hydraulically controlled opening/closing bucket) at random depths from surface to bedrock, formed into test cylinders, cured, and tested. Screen off particles larger than 10% of the test cylinder diameter.

b. Make a series of cylinders once every day or once every 500 cubic yards of treated in situ soil, whichever produces the greater number of tests. Cast cylinders in pairs for each sample location and each test interval (total of ten cylinders per test).

c. Test the stabilized soil cylinder pairs at 1, and 28 days after forming, with one pair reserved for testing at 56 days if the 28-day test pair does not pass. The stabilized soil shall meet the requirements specified in Subpart 2.7 of this specification section.

5. Documentation

a. Document quality control records, tests, and inspections and make available for review by the Engineer. Record measurements and test results and submit to the Engineer each day.

B. At a minimum, provide the following documentation and/or perform the following quality control testing. Documentation and test results shall be provided to the Engineer within the time frames indicated below.

1. Materials. Provide the following 30 days prior to initiation of ISS operations:

a. Source of imported materials Portland cement, GGBFS, drilling fluids, and any additives.

b. Certificates of compliance and/or or certified test results verifying that the materials meet requirements specified herein.

2. Water. Provide the following 30 days prior to initiation of ISS operations:

a. Source. From a potable water source.

3. Grout.

   a. Continuously maintain a record, by date and time, of the materials used to blend grout, including the weight of each material and volume of water used. Include in this record keeping the grout flow rate from the grout mixing plant.

   b. Conduct grout density and viscosity testing at the mixer or holding tank containing fresh grout ready for injection into the soil, as follows:

      1) Density testing in accordance with ASTM D4380, at a minimum frequency of one test per four hours of mixing plant operation.

      2) Viscosity testing in accordance with ASTM D6910, at a minimum frequency of one test per four hours of mixing plant operation.

4. ISS Depth and Area:

   a. Demonstrate to the satisfaction of the Engineer that the Bottom of Cell Elevations and complete coverage of the ISS Area have been achieved in accordance with the Construction Drawings and this Section.

   b. Demonstrate to the satisfaction of the Engineer ISS continuity by an overlapping pattern of the ISS cells has been constructed in accordance with the Construction Drawings and this Section.

5. Reagent Addition Ratio: For each ISS Cell, measure and document injection ratio and any other properties necessary to demonstrate to the satisfaction of the Engineer that the Reagent Addition Ratio has been satisfied.

6. Uniformity of Mix: Collect samples of the wet, uncured mixed soil to demonstrate uniformity of mix in compliance with Subpart 2.1 of this Section. Collect three wet samples once every day or once every 500 cubic yards of treated in situ soil, whichever produces the greater number of tests, from the upper third, the middle third, and the bottom third of one cell. Photograph the samples to create a record and present the samples to the Engineer for inspection.

7. UCS and Hydraulic Conductivity (Batch Testing): Collect samples and perform UCS and hydraulic conductivity testing to demonstrate compliance with Subpart 2.1 of this Section as follows:

   a. Representative samples of the wet, uncured mixed soil shall be collected with the in-situ sampler at depths from the upper third, the middle third, and the bottom third of one cell, as proposed by the Contractor and approved by the Engineer.

b. Wet samples shall be collected once every day or once every 500 cubic yards of treated in situ soil, whichever produces the greater number of tests. After 10,000 cy of material has been successfully treated, the required frequency may be reduced to once every other day or once every 1,000 cy of treated in situ soil, whichever occurs produces the greatest number of tests, subject to the approval of the Engineer.

c. At each sample location, the wet sample volume shall be sufficient to fill a minimum of six (6) cylinders for testing, a minimum of four (4) cylinders as spares, and cylinders as required for QA testing as indicated in Subpart 3.10. Cylinders shall have dimensions as indicated by ASTM 1633 (Method A). Particles larger than 10% of the test cylinder diameter shall be screened off prior to filling the cylinders.

d. UCS: A minimum of four (4) cylinders shall be allocated for curing and testing in accordance with ASTM D1633 (Method A). Two cylinders shall be tested after 7 and 28 days of curing, respectively. If the UCS of both 7-day tests meet the strength specified in Subpart 2.1, then the 28-day test is not required.

e. Hydraulic Conductivity: A minimum of two (2) cylinders shall be allocated for curing and testing in accordance with ASTM D 5084 (Method E). One (1) cylinder shall be tested after curing for 14 days. If the hydraulic conductivity of the 14-day test satisfies the criteria specified in Subpart 2.1, no additional testing need be performed. If the hydraulic conductivity of the 14-day test fails to meet the criteria specified in Subpart 2.1, then the second cylinder shall be tested following 28 days of curing.

f. Based on observed curing trends and in consultation with the Engineer, the Contractor may propose, at its own expense, additional samples at an accelerated schedule to demonstrate compliance with the performance criteria at Subpart 2.1, subject to the approval of and at the discretion of the NYSDEC.

8. Core Drilling of Treated Soils:

a. To provide visual verification of homogenization, pursuant to the Uniformity of Mix Performance Criteria, conduct core drilling of treated soils at locations selected by the Engineer. Cores shall be collected continuously from the top to the bottom of the ISS cell.

b. Cores shall be collected no earlier than 7 days and no later than 14 days after treatment.

c. Cores shall be collected at a frequency of one core per 1,000 square feet

of treated area. Coring locations will be biased toward perimeter ISS areas, where difficulties in the ISS process were encountered and/or in locations identified with the greatest soil contamination.

d. Core recovery shall be a minimum of 85%. The Engineer shall inspect the cores from the top to the bottom of the ISS cell to check for completeness of the ISS process, including break-up of the original soil matrix and uniformity of mixing of the grout with the soil. The Engineer shall also inspect the cores for pockets of untreated soil and free NAPL in the completed matrix, as defined by pockets of untreated soil greater than 3 inches in diameter or pockets of free NAPL greater than ½-inch in diameter, unless otherwise approved by the NYSDEC.

e. Following completion of each coring location, the borings will be filled with grout.

9. Documentation

a. Document quality control records, tests, and inspections and make available for review by the Engineer. Record measurements and test results and submit to the Engineer each day in accordance with Subpart 1.4 of this Section.

3.10 QUALITY ASSURANCE SUPPORT

A. As requested, collect duplicate samples of any collected quality control sample, for quality assurance testing by the Engineer.

3.11 CLEANUP OF ISS CONSTRUCTION AREA

A. Upon completion of the ISS construction, level remaining grout and ISS spoils and construct surface that is 5 feet below the final grades shown on the Construction Drawings to allow construction of site cover system or as directed by the Engineer.

END OF SECTION 02160

SECTION 02162

JET GROUTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work specified in this Section consists of furnishing all labor, equipment, materials, services, and items required in the event jet grouting is used to supplement in-situ stabilization/solidification (ISS). Contractor shall perform all work necessary for the completion of ISS to the limits and grades shown on the Construction Drawings and/or specified herein. The work includes, but is not limited to, the following items:

1. Conducting subsurface clearance, if needed, recognizing the Site consists of excessive debris/obstructions as indicated in the Contract Documents.

2. Planning and design of jet grouting – layout of plant, equipment, and materials; design of grout, locations, procedure, and sequence of jet grouting to perform ISS that meets the requirements of this Section.

3. Mobilization and assembly of plant, equipment, utilities, materials, and supplies necessary for jet grouting.

4. Performance of field trials and test programs to confirm and demonstrate that the grout columns formed by the selected jet grouting methods and parameters meet the specified dimensions and engineering properties.

5. Performing in a manner that results in a solidified soil mass with dimensions and engineering properties specified in this Section, the Construction Work Plan (CWP), and ISS Work Plan (IWP).

6. Management and disposal of construction water and excess grout (spoils) per this Section and other referenced sections recognizing that NAPL is present in most of the zones where ISS is proposed as indicated in the Contract Documents.

B. This Section applies only if Contractor is required to use this technology to supplement ISS. The Site consists of excessive debris/obstructions (as indicated in the Contract Documents) and Contractor may be required to utilize jet grouting to supplement ISS around debris/obstructions.

1.2 REFERENCES

A. American Petroleum Institute (API)

1. API Specification 13A (Spec 13A) – Specification for Drilling-Fluid Materials

B. ASTM International, formerly known as American Society for Testing and Materials (ASTM)

1. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

2. ASTM C150 – Standard Specification for Portland Cement

3. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete

4. ASTM C595 – Standard Specification for Blended Hydraulic Cements
5. ASTM C989-06 – Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
6. ASTM D1633 – Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders
7. ASTM D2488 – Standard Practice for Description and Identification at Soils (Visual-Manual Procedures)
8. ASTM D5084 – Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

C. Where reference is made to one of the above standards, the current revision in effect at the time of bid opening applies.

1.3 QUALIFICATIONS

A. The work of this Section is specialized. Contractor and Contractor personnel performing the work described in this Section shall meet the following requirements for the specified roles:

1. Contractor. Contractor shall have completed at least 10 jet grouting projects over the last ten years. Contractor shall have completed at least two jet-grouted projects having objectives and installation requirements similar to those of this project and be familiar with the NYSDEC's In-Situ Solidification QA/QC technical guidance.
2. Jet Grouting Supervisor. A competent, full-time, jet grouting supervisor with a minimum of ten years of construction experience with five years of on-site experience managing jet grout field operations of similar size and scope and shall have supervised a minimum of two jet-grouted projects. The jet grouting supervisor shall be on-site at all times during the jet grouting operations and shall be in control of the jet grouting work. The jet grouting supervisor shall have experience and be knowledgeable of all aspects of jet grouting including, but not limited to, drilling of grout holes; grout formulation, properties and admixtures; mixing methods, grout pumping and grout injection; and quality control testing required for the jet grout construction.
3. Drill Operator (Driller). The full-time driller shall have a minimum of five years' experience in all aspects of jet grouting with demonstrable knowledge in difficult drilling conditions, ability to maintain a true borehole trajectory, maintenance of jetted spoils return, and experience with the drill rig(s) that will be used on the Site.
4. Jet Grout Equipment Operator. The full-time jet grout equipment operator for the equipment shall have a minimum of five years' experience in the last five years in the operation and maintenance of jet grouting rods, grouting plants, and high-pressure pumping equipment required to perform jet grouting.
5. Quality Control (QC) Testing Laboratory. Contractor shall collect required samples and send them to a QC Laboratory for testing. The QC Laboratory selected by Contractor shall have conducted performance tests (hydraulic conductivity tests, unconfined compression tests [UCS], etc.) on soil-grout or soil mix samples for at least five different projects.

B. The Owner reserve the right to review the qualifications of the proposed personnel/laboratory for approval or rejection. This review may include interviews with the personnel by the Owner. If Contractor personnel and/or the Subcontractors are not approved by Con Edison, Contractor shall provide alternates for Con Edison's review and approval.

C. Qualified personnel shall be approved by the Owner prior to commencing the work. Pre-qualified personnel/laboratory shall not be removed from the project without prior written consent of the Owner. The Owner also reserves the right to remove any of Contractor's personnel from the Site if they are found to impede the progress of the work or do not conduct the work in accordance with the Specifications.

1.4 DEFINITIONS

A. Admixture: Any approved additive used to modify the properties of the grout.

B. Boulders: Soil particles greater than 12 inch in diameter, as defined by ASTM D2488.

C. Cement: A commercially available binder that sets or hardens in the presence of water. Cement shall be selected based on performance requirements (i.e. Portland cement I, 1L, II, III or slag cement).

D. Clay additive: A commercially available product that will produce a thickened viscous fluid when properly mixed with water. The most common is natural sodium montmorillonite (bentonite).

E. Cobbles: Soil particles between 3 inch and 12 inch in diameter, as defined by ASTM D2488.

F. Deviation: Horizontal departure from the intended drilling path.

G. Drilling Deviation: Drilling deviation measurements shall be performed for every jet grouted column and coring using an instrument capable of biaxial deviation measurements of all down-the-hole deviations. Contractor shall select a biaxial instrument capable of measuring the rod deviation over the entire length of the drill hole to a final depth.

H. Groundwater: Water in saturated zone below the existing ground surface within the work area.

I. Groundwater level: Elevation at which groundwater is observed in a trench, monitoring well, or piezometer.

J. Grout Column: A cylindrical column or partial column created by injecting grout into the ground starting from specified bottom depth to ground surface (post-excavation of top 5 feet).

K. Jet Grouting: The process of creating “soilcrete” in place with a stabilizing grout mix delivered at pressure through nozzle(s) at the end of drill rods inserted in a borehole. The soilcrete is created by lifting (and rotating if required) the drill rods and nozzle(s) at slow, smooth, constant speeds, cutting the soil with water and/or air while tremie feeding an engineered grout slurry through the nozzle(s) to achieve a thorough mixing action.

L. Monitor: A drill pipe designed to convey the three elements of the jet grouting process; air, water, and grout. The monitor shall have at least two injection points 180 degrees apart. Each injection point shall have a grout nozzle with an air nozzle surrounding the grout nozzle and will inject grout under pressure into the void excavated by means of a high-pressure air and/or water jet injected through a separate nozzle.

M. Obstructions: Subsurface man-made or natural object that impedes advancement to the specified design/target depth. The determination of what constitutes an obstruction will be made in the field by the Owner and/or the Engineer based on field data. Information related to known debris, structures and utilities are included in the Contract Documents.

N. Overburden: Material overlying the top of bedrock.

O. Portland cement: A hydraulic cement that sets and hardens by reacting with water, through hydration, to form a stonelike mass. It is manufactured by crushing, milling and blending raw materials containing lime, iron, silica, and alumina.

P. Soil-grout mass: Mixture of grout slurry and in-situ soils formed by jet grouting process.

Q. Slag: By-product of iron and steel-making.

R. Slag cement: A hydraulic cement formed when granulated ground blast furnace slag is ground to a suitable fineness and is used to replace a portion of Portland cement.

S. Soilcrete: Solidified mixture of grout slurry and in-situ soils formed by jet grouting process.

T. Spoils: Surplus excavated soil, backfill or grout that is not part of the grouted soil mass.

U. Subsurface Clearance: The process of identifying and locating both known and unknown underground utilities and structures prior to construction activities.

V. Surface Water: Water that enters the work area above the ground surface from either natural or artificial sources.

1.5 DESIGN REQUIREMENTS AND PERFORMANCE CRITERIA

A. The jet grouted soil mass shall meet the following design requirements and minimum performance criteria:

1. Shall construct a continuous soil grout mass within the limits indicated in the Construction Drawings at the locations included in the approved IWP.
2. Shall be installed from ground surface (post-excavation) or approved top depth/elevation to either the depth/elevation shown on the Drawings or approved in the IWP.
3. The soilcrete columns shall have a minimum overlap of 1/8 of the column diameter or 12 inches between two adjacent columns at their actual positions.
    a. Drilling technique shall achieve a maximum drilling deviation of 1% or less
    b. Borehole deviation measurements shall be obtained and reported by Contractor for each installed jet grout column to demonstrate that minimum specified column overlap has been achieved along the entire length of the columns.
    c. Verticality tolerance shall not exceed 3 inches.
4. The soilcrete columns shall be coreable within 14 days of in-situ curing. Jet grouted mass shall be cored to demonstrate compliance with column continuity, deviation, hydraulic conductivity and strength requirements.
5. Jet grouted mass shall be cored at the minimum column overlap positions unless directed otherwise by the Owner. Samples will be collected from the core for testing. The location of samples to be tested will be determined by the Owner based on column production data, grout cuttings inspections, core inspections, and drilling deviation measurements.
6. Cores shall be collected at a frequency of one core per 1,000 square feet of treated area.
7. The completed jet grout columns shall provide a continuous, low hydraulic conductivity soil mass over the entire grouted volume with the following properties:
    a. Hydraulic Conductivity (ASTM D5084) of cored samples after 28 days of curing shall be equal to or less than $1x10^{-6}$ cm/sec, with allowance for 5% of the tests to be equal to or less than $1x10^{-6}$ cm/sec (over the entire soil mass or as agreed upon individual segments of construction). Tests shall be conducted at an effective confining stress of less than or equal to 10 pounds per square inch (psi), with a maximum gradient of 25.

b. UCS (ASTM D1633) of cored samples after 28 days of curing shall be at least 50 psi.

8. Maintain settlement or heave to prevent damage to existing structures on site and on adjacent properties (especially the ramp/walkway structures on-site and building on the property to the east).

9. In the event that a test does not meet this requirement, Contractor shall repair the soil mass per Contractor's Contingency Plan described below. Alternatively, Contractor can request Owner to evaluate the impact to determine if and what repairs are necessary.

1.6 SUBMITTALS

A. Submit resumes of field personnel detailed in Part 1 of this Section at least 30 calendar days prior to construction. In the event that Contractor is operating the work with more than one crew, then Contractor shall provide resumes for each personnel from each crew. Work shall not be started, nor materials ordered, until Contractor's qualifications have been approved by the Owner.

B. Submit a Jet Grout Test Program Plan (JGTPP) to the Owner 30 calendar days prior to the start of jet grout test program initiation for review and approval.

1. The JGTPP shall meet the requirements of paragraph 3.4 herein, and include and detail all equipment, layout, methods, and procedures for jet grouting test programs, including sampling and testing to establish Contractor's means and methods,

2. The JGTPP shall detail the means for demonstration of successful installation of jet grout columns, including determination of dimensions and properties of jet grouted elements/mass.

C. The IWP shall include the following items:

1. Proposed methods of subsurface clearance and disposal and handling of spoils taking into consideration that the Site has excessive debris/obstructions and that the spoils may be mixed with NAPL as NAPL is present in most zones where ISS is proposed (as indicated in the Contract Documents).

2. Proposed schedule and installation sequence for ISS.

3. Proposed construction methodology and equipment to perform the work, including creating soil grout mass within approved limits, documentation to demonstrate ISS within approved limits, equipment specifications, controlling and handling spoils (including excess grout), and controlling stormwater run-off. Also, include grout mixing, testing, placement, pumping, handling and disposal procedures and/or methods. Construction methodology shall also include approach to implement ISS around debris or obstructions and overlap with soil mass grouted with using other methods, if applicable.

4. Maximum variation in ISS bottom depth/elevation than what is shown on the Construction Drawings without a contract variation.

5. Proposed equipment setup and site use layout including storage areas, grout mixing areas, and access roads.

6. Proposed water source, cement and other ingredients to create the grout mix that Contractor plans to use and respective percentages. If different than that included as part of the Contract Documents, Contractor shall demonstrate that the selected water, cement and other ingredients has equal or better performance.

7. A Contingency Plan shall be included to address steps that Contractor will implement in the event of grout loss, inability to advance to required depth/elevation due to debris/obstruction, adverse weather and changes in groundwater elevation. Also, propose contingency plans to address ISS segments that fail to meet the requirements in this Section.

8. Proposed Site clean-up procedures, including spoils and slurry disposal.

9. Site development plan drawing to illustrate temporary facility locations, vehicle parking areas, grout mixing locations, Site traffic routes, stockpile areas, and storage areas.

D. The IWP shall also include information specific to ISS using jet-grouted columns. Contractor shall provide the following information for review and approval by the Owner:

1. Configuration and schematic details of complete system for jet grouting with proposed plant, equipment, and method of construction including the arrangement of grout mixing and injection equipment, and other necessary details. Provide details on how the proposed plant and equipment will be relocated to install the jet grout wall at the different locations, if applicable.

2. Plant, equipment, and material descriptions including performance records and manufacturers' specifications.

3. Details of the proposed jet grouting process including the materials that will be jetted through the nozzle to cut the soil and form the soilcrete, (e.g. single fluid, double fluid, or triple fluid).

4. Design of the jet grout columns, including column target diameter, spacing, overlap, verticality, target strength and hydraulic conductivity.

5. Working procedure (drilling, grouting and sequence of execution), which shall include methods and equipment for drilling (including drill bit size) and supporting grout holes, including advancement through obstructions, cobbles, and boulders.

6. Jet grouting installation parameters, which at a minimum shall include: nozzle withdrawal and rotation rates; jetting (air and water) pressures; flow rate; and grout injection volumes and pressures, as applicable for the particular systems proposed.

7. Materials: Grout mix designs, types and purposes of all admixtures, sources of mix materials, and material data. Contractor shall submit a design grout mix to be approved by the Owner.

8. Ground movement monitoring plans, including precautions to be taken to avoid unacceptable settlement, heave or lateral displacements.

9. Equipment and procedures for protecting, instrumenting and monitoring existing pipelines, sewers, storm drains, underground utilities, and structures (on-site and on adjacent properties).

10. Spoils Management: Methods and equipment for management of return flow, including collection, volume measurement, storage, transportation, and disposal. Contractor shall also comply with the Waste Management Plan for spoil management per Specification Section 02120 – Off-Stie Transport and Disposal.

11. Quality control procedures as required by the Contract, including methods and equipment for measurement, and recording of jet grouting installation parameters.

12. Testing: Equipment, layout, methods and procedures for sampling and testing of jet grout columns to determine dimensions and properties of jet grouted element/mass.

13. Calibration records for all pressure gauges, flow meters and scales from an accredited laboratory testing agency and certification of master gauge calibration. Initial calibration certification on all gauges shall be submitted before commencement, thereafter calibration checks shall be performed on a weekly basis.

14. Method and sequence of jet grout column installation including location and details of the test program to be conducted prior to production jet grouting.

15. Proposed layout, locations, and identification numbers of grout holes for each area to be constructed by jet grouting. This information shall include diameter, spacing, elevations, and overlap of columns. Column top elevations shall be selected such that the columns can be installed without risk of grout blowout at the ground surface.

16. Methods and equipment for measurement and real-time continuous recording of both drilling and jet grouting parameters as specified herein.

17. Equipment and procedures for sampling and testing completed columns.

18. Format and forms (both manual and computer-generated) to be used in recording of drilling and jet grouting performance data.

19. Relevant information related to the datalogger system and other software.

20. Equipment and procedures for measurement and surveying of drilling deviations and verticality of the jet grout hole including the manufacturer's operating manual. Provide details concerning the operation and data reduction of the instruments used for measuring the drilling deviations.

21. Method to conduct post-jet grouting cores including drilling method, sampling method and design of grout used to backfill boreholes.

22. Equipment and procedures for repairing the jet grout columns that do meet the specified design and performance criteria.

E. Submit field quality control procedures for construction of the jet grouted column to the Owner 30 calendar days prior to the start of construction for review and approval. Include at a minimum:

1. Quality control testing and sampling equipment, measurements of column depth and verticality, alignment, and continuity, procedures to obtain bulk samples of grouted column at various depths, sample handling and storage procedures.

2. Name of proposed testing laboratory. If Contractor proposes to perform laboratory testing using their own facility and equipment, provide information about the laboratory, equipment, and laboratory manager.

3. Contractor's qualifications in accordance with Part 1 of this Section.

4. Procedures for quality control testing in accordance with Part 3 of this Section.

F. Contractor shall submit a daily report to the Owner. The report shall include a summary of the daily activities, documentation of quality control measurements and testing results executed per Part 3 of this Section.

G. Contractor shall submit a compilation of quality control measurements and testing, as well as the requirements in Part 3 of this Section, 60 calendar days after completion of jet grouting, or as agreed upon by the Owner.

H. Jet Grouting Performance Records. Submit the following items daily during the execution of the test and production jet grouting programs:

1. Grout hole data, including hole identification number, location, date and time of drilling, diameter, total depth, and spacing.

2. In each grout hole, description of depth and extent of obstructions, cavities or voids, soft spots or cobbles and boulders; depths of drilling fluid losses; and any major interruptions in drilling work.

3. Beginning and completion times and dates for injection of each grout column.

4. Grout mix data, including mix proportions and setting times.

5. Jet grout drilling and installation parameters used to construct each grout column, including variation with depth.

6. Grout takes for each grout column, including variation with depth.

7. Rates of rotation and withdrawal of jet grout nozzle(s) for each grout column, including variation with depth.

8. Test samples taken from soilcrete produced in test program and during production.

9. Return Flow: Estimated amount of return flow materials produced as result of each grout column installed, and volumes of return flow materials removed from the project site for disposal. Records shall also include visual descriptions and density.

10. Other pertinent observations such as grout escapes, ground heave, or other unusual behavior.

I. Laboratory Test Results. Submit laboratory test results to the Owner within three days of testing.

J. Field Test Results. Submit the results of field tests performed, if any, to the Owner within three days of testing.

1.7 COMPLIANCE WITH APPLICABLE REQUIREMENTS

A. Contractor shall comply with all applicable Federal, State, and Local codes, ordinances, ARARs, statutes and standards.

1.8 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

A. Contractor shall implement a Construction Quality Assurance Plan (CQAP) that will verify that the work and materials are in accordance with the design and meet the requirements of this Section.

B. Owner will implement a CQAP with associated Construction Quality Control (CQC) procedures that will verify that the work and materials are in accordance with the design and meet the requirements of this Specification, and in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

1. Owner will specify additional samples to be collected by Contractor for quality assurance testing using a qualified Independent Testing Laboratory to document that the materials are in accordance with this Section. Contractor shall obtain samples for quality assurance testing, as requested by the Owner.

2. Contractor shall be responsible for repairing or replacing portions of the grouted soil mass that is found deficient at Contractor's own expense to meet the requirements of this Section and other Contract Documents.

C. Per Owner's request, Contractor shall supply samples of proposed water source, cement and other grout mix ingredients in sufficient amount for independent testing, material properties, sources and manufacturer's certificate of quality.

1.9 AVAILABLE DATA

A. Available data is presented in the Contract Documents for the Contractor to utilize for the design and implementation of ISS. This data set is an assembly of work products of the Owner and includes boring logs and laboratory test results. Unless explicitly described in this Section, the conclusions in this data set do not represent the Owner's interpretation of the data and recommendation. Contractor shall evaluate the data, validate the merit of the conclusions, and conduct the design independently.

B. Jet grout compatibility testing has been performed with Site soils. Test results are included as part of the Bench-Scale ISS Treatability Study included in the Remedial Design Report and is for information purposes only.

C. Contractor is responsible to propose a jet grout mix that meets the design requirements of the Technical Specifications and Construction Drawings. If Contractor elects to propose an alternative jet grout mix and/or use of additional additives, Contractor shall conduct its own laboratory mix design testing consistent with that documented in the Contract Documents and submit to the Engineer for review and approval. The laboratory mix design testing program shall include, but not be limited to, acceptable hydraulic conductivity testing and UCS testing consistent with those in the Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIAL SPECIFICATIONS

A. Portland Cement

1. The Portland Cement can be Portland Type I, Type 1L, Type II or Type III as per ASTM C150 and ASTM C595 or as accepted by the Owner.

2. A written mil certification specifying cement quality shall be provided by the cement manufacturer for approval by the Owner.

3. Use of reclaimed cement or cement containing lumps or deleterious matter shall not be allowed.

B. Water for Grout

1. Contractor shall identify a source of water to be used for the work and propose it for Owner review and approval.

2. Contractor shall provide all trucks, piping, pumps and necessary accessories to transport and distribute the water as required.

3. Prior to the start of construction, Contractor shall obtain water from the source that will be used. Contractor shall verify that the water is free of deleterious substances, organic matter, leachate, or oil and grease that may adversely affect the properties of the grout. Water shall exhibit a pH in the range of 5 to 7.5, a total hardness of less than 500 ppm and total dissolved solids (TDS) below 500 ppm, and an organic content less than 50 mg/l.

4. Contractor shall test the water supply at least weekly for the pH, conductivity, temperature, total hardness, total dissolved solids (TDS), and total organic carbon (TOC). The pH, conductivity, and temperature shall be measured immediately in sample volume collected from the water using properly calibrated field instrument and a record of calibration shall be maintained. Samples for the remaining parameters shall be submitted to a laboratory within one day of collection and analyzed by the methods indicated (or equivalent), including Total hardness (EPA 130.1 or 130.2), TDS (Standard Methods 2540C), and TOC (9060A). Contractor shall submit the results to the Owner within one day of receiving the test results, and within 7 calendar days of collecting the samples. Contractor shall be responsible to ensure that the water supply meets the requirements of this Section.

5. In the event that the water source does not meet these requirements or Contractor wishes to use an alternative water source, Contractor shall notify the Owner and shall propose an alternative water source for Owner consideration and approval.

C. Additives

1. Additives of any kind must be approved by Owner, including the following:

   a. Common water treatment additives used to correct water quality or enhance hydration and mixing. These additives may include soda ash, lime, or alum.

   b. Admixtures of softening agents, dispersants, retarders, or plugging or bridging agents added to the water or the grout to permit proper pumpability, to control set time, and to prevent segregation and bleeding. Admixtures shall be non-toxic and biodegradable and conform to ASTM C494.

   c. Retarders, thinners, and accelerators used to correct specific problems.

2. Peptizing or bulking agents shall not be permitted for mixing with grout.

D. Grout

1. Grout must have consistency that is fluid and pumpable and proportioned to provide the required strength and mixing consistency.

2. The final grout mix shall comply with the minimum required strength and hydraulic conductivity as required by the design.

2.2 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

A. Contractor shall make all arrangements for transportation, delivery, and handling of materials required for execution and completion of jet grouting.

B. Materials shall be protected from moisture, spillage, and deterioration during transit to and storage at the site.

C. For each shipment of materials, Contractor shall provide written certification of compliance from the manufacturer verifying that the materials meet the requirements of this Section. Supplier's certified weight of each delivery of materials shall also be provided.

2.3 EQUIPMENT

A. General

1. All equipment used for drilling grout holes; lowering, raising and rotating jet monitors; mixing grout; supplying pressurized grout and air or air-water to jet monitors; and jet monitors used to construct the soil-grout mass columns shall have proven performance records for use in jet grouting work.

2. Spare parts and equipment shall be available on site to maintain jet grouting equipment in satisfactory operation condition at all times during execution of the jet grouting work.

B. Jet grout drilling equipment shall be of the type and capacity suitable for drilling in materials at the site and of the required hole sizes and depths. Jet grout drilling equipment shall be suitable for drilling the jet rods to the depths required, then raising and rotating the jet rods to the depths and at the rates required for the construction. If the drilling deviation instrument is attached to the jet rods, then the instruments must remain operational for the entire depth of hole. The borehole shall be stable and shall have sufficient annular space between the jet grout drill rods and the sidewalls of the drill hole to be capable of maintaining a constant flush of cuttings to the surface. The drilling technique shall be capable of achieving a maximum target drilling deviation of 1-percent or less.

C. The jet grout drill rig shall have an integrated data acquisition system that will continuously monitor and record the following parameters in real time during drilling:

1. Clock time
2. Depth
3. Drilling speed / rod lift rate
4. Thrust on drill rods
5. Torque
6. Drill rod RPM's (revolutions per minute)
7. Drilling fluid pressure
8. Specific energy
9. Drilling fluid (grout/water) flow rates
10. Position and inclination and hole deviation as specified herein.

D. Jet Grouting Monitors. Jet grouting monitors shall have performance characteristics, operating ranges and capacities suitable for producing grout columns of the diameters, depths, and achieving the design and performance criteria shown on the approved Shop Drawings and as specified herein.

E. Jet Grouting Drill Rod String. The length of the jet grouting drill rod string and the height of the relevant mast should not be shorter than the length of the designed jet grouted element. If imposed by large depths and access or overhead limitations, the drill rod string shall be divided into the minimum number of elements, in order to minimize the need to interrupt the jet grouting operation.

F. Grout Mixing and Injection Equipment. Grout mixers and holding tanks, water tanks, air compressors, and pumps shall be of sufficient capacity to ensure adequate supply of grout, air,

and water at required pressure for the jet grouting operations, during a full work shift, to produce grout columns of the quality and dimensions necessary.

G. Proportioning of Grout Mixes. The grout plant shall include calibrated meters for measuring accurately the volume of water and any liquid admixtures used in grout, and calibrated scales for measuring accurately the weight of cement and any solid admixtures used in each batch of grout.

H. Monitoring of Jet Grouting Performance. Equipment used to measure and record jet grouting parameters shall consist of automatic, real time data collection systems.

I. Rig mounted instrumentation and datalogging system shall be provided to have continuous electronic data recording and real-time display of the most significant operational parameters in order to:

1. Monitor and document both drilling and grout injection process in real-time while providing a permanent electronic record; and

2. Verify installation through quantification and comparison of pre-and post-treatment conditions.

PART 3 – EXECUTION

3.1 GENERAL

A. Conduct all jet grouting related activities in the presence of the Owner/Engineer.

B. Refer to Specification Section 01050 - Surveying for surveying requirements.

C. Comply with the Health and Safety Requirements set forth in the Health and Safety Plan developed for the work. In addition, conform to all Site Health and Safety requirements.

D. Jet grout injection and jet monitor rotation and extraction rates shall be sufficient to produce grout columns meeting the minimum requirements specified herein.

E. Any jet grout hole lost or damaged as the result of mechanical failure of equipment; inadequacy of grout, air, or water supplies; debris or obstructions; or improper drilling or injection procedures shall be backfilled with cement grout and replaced by another hole, drilled and injected.

F. Do not jet grout within 2 feet of jet grout columns that are less than 48 hours old, as measured between outside edges of the columns, unless a wet-on-wet installation sequence is performed using an all grout double fluid system. The installation of any adjacent columns shall not have adverse effect on any previously installed soil-cement columns. The finished columns shall meet the minimum overlap requirements specified in this Section.

G. Equipment for mixing, holding and pumping grout shall be in a secure location and shall be operated to minimize spillage of material. No material shall be allowed to enter storm drains or other drainage courses. Refer to Specification Section 01110 – Environmental Protection Procedures.

3.2 SITE PREPARATION

A. Prepare the plant area, staging areas, and work platform.

B. Install erosion controls and stormwater controls in accordance with the Specifications.

C. Install and maintain survey stakes and/or markers in appropriate locations to identify horizontal and vertical limits of jet grouting. These stakes will be referenced for quality control and quality assurance measurements during ISS.

3.3 SUBSURFACE CLEARANCE

A. Contractor shall conduct subsurface clearance in accordance with the Specifications. Contractor shall review the debris/obstructions related information included in the Contract Documents to assess subsurface clearance requirements.

3.4 JET GROUT TEST PROGRAM

A. A jet grout test program shall be conducted by Contractor prior to production work in accordance with the accepted Jet Grout Test Program Plan (JGTPP) submittal. A minimum of five jet grout columns shall be installed as part of the test program. The test program shall be used to optimize/verify the various parameters including type of jet-grouting (single, double or triple), necessity of pre-jetting with water, grout mix composition, fluid(s) flows and pressures, rotational speed, lift rate, spoil return, grout, and number and size of nozzles; and confirm that resultant in situ soil-cement properties and dimensions meet required design criteria.

B. The test program will be observed, reviewed, and verified for contract conformance by the Owner. The test program shall be installed in an area near the planned production work. The test program location shall be selected taking into consideration the soil stratigraphy and depths of columns anticipated during production work.

C. Each test section shall consist of a plan of elements suitable to demonstrate feasibility and shall be installed using the same means and methods and to the same elevations specified for the production jet grouting work.

D. The top 5 to 10 feet of the test columns shall be exposed by excavation and measured for geometric properties. In addition, three core samples (or other testing method proposed by Contractor and approved by the Owner) shall be used to demonstrate grout column size/geometry over the full depth of the grouted column. The cores shall be performed at locations designated by the Owner.

E. Representative specimens from each core shall be selected by the Owner and sent to laboratory for hydraulic conductivity (ASTM D5084) and UCS testing.

F. The verticality of the core hole shall be measured after drilling and shall be compared to the jet grout column as-built data.

G. If the jet grout columns in the test program are extended to top of bedrock, perform one boring through a test column to confirm that the bottom of the test columns are extended to bedrock and that the construction method and equipment used by the Contractor can determine the top of bedrock.

H. The results of the test program and the recommended jet grouting parameters for the production work shall be submitted in a report to the Owner for review. Contractor, at their expense, may be required to repeat the construction of a test section if the results of the test program do not meet the project requirements. The test program shall confirm that the installed grout columns meet the required design criteria prior to Contractor proceeding with production work.

I. The same or similar construction equipment used for the test program shall be used for the production installations, unless approved otherwise by the Owner.

3.5 PRODUCTION JET GROUTING

A. Perform production jet grouting to perform ISS at locations and with dimensions shown on Construction Drawings and as specified herein.

B. The arrangement of the grouting equipment shall provide continuous agitation of grout before its injection. Contractor shall prevent the equipment and lines from becoming fouled by determining the set time of the grout mix, monitoring the time that has elapsed from when a batch of grout has been mixed, maintaining grout ready to be injected in constant circulation, and periodically flushing the grout system with water. Grout that cannot be placed, for any reason, within two hours after mixing shall be disposed of in accordance with the Specifications and as approved by the Owner.

C. During jet grouting, maintain free return flows at all times. If reduction of flow rate is observed, Contractor shall implement measures immediately to re-establish the original flow rate.

D. The sequence of jet grout column installation shall be in accordance with the design (submitted by Contractor) and approved by the Owner.

E. Cooperate with Owner in determining that the wall has been constructed to the specified depth or to the top of bedrock.

F. Conduct all jet grouting in a manner such that there is no heave, settlement, lateral displacement or loss of support of any existing building, structure, facility, or utility on the Site and on the adjacent properties.

G. Prepare 3 cube samples from the grout mix during each workday. Take samples from production grout batches. Test the UCS of the samples after curing periods of 3, 7 and 28 days. Initial test results will be used to establish a suitable acceptance criterion for the strength tests. Prepare, store, and test the grout samples in accordance with ASTM C109.

3.6 REDUCTION IN SPOIL RETURN

A. Contractor shall investigate any reduction in spoil return immediately. Any jet grout hole lost or damaged as a result of mechanical failure of equipment; inadequacy of grout, air, water supplies; debris/obstructions; or improper drilling or injection procedures shall be backfilled with cement grout and re-drilled.

3.7 QUALITY CONTROL JET GROUTING CORINGS

A. After completion of the jet grouting, perform coring of production jet grout columns by either sonic drilling or standard rotary drilling methods after 14 days of in-situ curing. The primary purpose of the coring is to obtain samples for laboratory testing and to evaluate column continuity and deviation. Coring shall be performed from top of the jet grout column to the bottom of the column; use a drilling technique capable of keeping maximum drilling deviation to 1% or less. This will be completed in accordance with the NYSDEC's In-Situ Solidification QA/QC technical guidance.

B. Perform continuous core sampling at the minimum column overlap positions or at location directed by the Owner over the full depth of the grouted column. Based on the extent of ISS that will be performed using jet grouting wall, post-grouting coring frequency during production jet grouting will be selected by the Owner as part of the IWP review. As a minimum, 2 post-grouting exploratory boreholes shall be cored for each location ISS is performed using jet grouting. Post-grouting coring frequency may be adjusted in the field based on production records and/or other field observations during production.

C. Contractor shall use equipment and procedures that are capable of obtaining undisturbed core samples and minimize core losses. Provide wooden core boxes for storage of core samples, labeled to indicate boring number, depths of coring intervals, and run numbers. Do not place core samples from more than one boring in the same box.

D. Prepare a log summarizing the results of each post-jet grouting exploratory boring.

E. After completion of coring of grout columns, backfill the boreholes in the grout columns with the grout in accordance with the approved IWP.

3.8 LABORATORY TESTING

A. Contractor shall be responsible for sample preservation, storage, and transport to the testing laboratory. All samples for testing will be selected by the Owner.

B. Test grout mix cube samples for UCS in accordance with ASTM C109.

C. Test soil-grout mass core samples selected by the Owner for hydraulic conductivity (ASTM D5084) and UCS (ASTM D1633).

3.9 SITE CLEANUP

A. After the jet grout soil mass achieves the minimum specified engineering properties, remove the work platform and excess grout. Remove the excess grout such that in 5 feet below final grade (indicated in Construction Drawings) to allow construction of site cover system or as directed by the Engineer.

3.10 RECORD DRAWINGS

A. Prepare plan and profile record drawings for soil mass grouted using ISS (based on level survey and borehole depth measurements) similar to those included in the Construction Drawings and provide them to the Owner as part of the quality control documentation in accordance with Section 01783 – Project Record Documents.

** END OF SECTION 02162 **

SECTION 13091

STRUCTURAL MONITORING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work includes all labor, equipment and materials required to install, maintain, and monitor structural instrumentation on existing structures at and adjacent to the Site.

B. Protect from damage and provide safe access to the Engineer during installation and monitoring of the structural instrumentation. Repair or replace damaged or inoperative instruments installed or damaged by Contractor at his own expense.

C. In addition to the minimum monitoring requirements identified below, the Contractor, at his own expense, may for his own purposes and at his own discretion install, monitor, and interpret additional instrumentation. The instrumentation specified and shown in the contract documents is for assessment of impact of ISS implementation on structures on and adjacent to the Site. The instrumentation is not to determine construction safety, which is the responsibility of Contractor.

D. Coordinate and obtain all permissions required, both public and private, to install structural instrumentation.

E. Coordinate with the Engineer to verify consistency of collected data.

F. Implement corrective measures based on interpretations of monitoring data program.

G. Dispose of all instruments at the end of the project as instructed by the Engineer.

H. Provide for and support regulatory oversight and inspections. Specific requirements will be dictated by regulatory oversight personnel.

1.2 SUBMITTALS

A. Submit the following for review by the Engineer at least four (4) weeks prior to start of activity:

1. Drawing(s) indicating the distance between the limits of excavation and structures to be monitored based on actual field measurements.

2. Pre-construction condition surveys including location details, structure type, materials, structural conditions, corrosion conditions of steels, existing damage, signs of distress or disrepair observed during visual survey along with graphical depictions and/or photographs.

B. Submit the following for review and acceptance by the Engineer at least four (4) weeks prior to start of activity:

1. Personnel qualifications demonstrating compliance with Paragraph 1.4 herein.

2. Working Drawings listed below, as prepared by qualified specialists submitted above.

a. Installation Plan and Schedule: For each instrument type to be installed by Contractor, provide full details of the proposed plan and schedule for installing and monitoring instruments including proposed locations, types, and installation and protection methods of all instruments including structural monitoring points (SMP), seismographs and crack gauges (as required). Provide the nomenclature for identifying instruments and the monitoring schedule.

b. Installation Records: Within 5 workdays of installing each instrument, Contractor shall submit to the Engineer, the as-built instrument location as specified, and its corresponding installation record sheet. The installation record sheet shall include, but not be limited to, the installed location of each instrument with instrument identification numbers, established elevations, initial elevations, offset and stationing, and initial coordinates. Contractor shall also furnish details of installed instruments showing all dimensions and materials used, a separate statement describing installation procedures for each instrument, and as-built drawings of each instrument location.

c. Location and type of any additional instruments installed by Contractor.

C. Within five (5) workdays of installing the automated total station, submit to the Engineer a Site Plan showing the location of the Automated Motorized Total Station (AMTS) including means and methods to secure and protect the instrument from vandalism.

D. Reports and Records: Provide reports of monitoring data for the instruments specified in Section 3.2 to the Engineer.

E. Product Data and Samples: Provide manufacturer's brochures on each product.

F. Submit proposed remedial measures to the Engineer to be taken if the instrument Action and the Maximum Levels are reached.

G. Submit post-construction condition survey for review by the Engineer within four (4) weeks after completion of activity. Post-construction condition survey shall be performed using the same methods and requirements as the pre-construction condition surveys. Conditions observed from the post-construction condition surveys will be compared with those observed during the pre-construction condition surveys.

1.3 DEFINITIONS

A. Structural Monitoring Point (SMP) – A system for monitoring vertical (settlement or heave) and horizontal movement at an existing above ground structure measured by optical survey methods.

B. Seismograph – Electronic recording device with vibration transducer capable of monitoring and recording ground vibrations induced by construction activity.

C. Crack Gauge – A tool affixed to a structure to measure the width of a crack in the structure and used to monitor changes in the width of the crack over time.

D. Automated Motorized Total Station (AMTS) – An advanced optical monitoring system built around high-precision robotic total stations, which is used to remotely monitor SMPs and seismographs, within automated monitoring area.

E. Benchmark – A control point used as reference for elevation and horizontal position.

F. Structural Instrumentation Monitoring System – An integrated, internet-accessible system that receives, stores, transfers, displays and reports data from Structural Instrumentation that are collected by automated means or manually logged. The system shall provide Alert Notifications as defined herein.

G. Data Logger – An electronic device that is used to store data over time, commonly known as data logging. This is used in structural monitoring and instrumentation to automatically collect real-time data from the sensors and display it over the device.

H. Action Level – Value of measurement or reading from instrumentation at and above the corrective action required as specified herein.

I. Maximum Level – Value of measurement or reading from instrumentation that Contractor must stay below at all times.

1.4 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

A. All work shall be conducted in accordance with all applicable codes, standards, and permits.

B. Contractor shall be responsible for all aspects pertaining to the installation, maintenance and monitoring of the structural instrumentation specified herein. Engineer will be responsible for analysis and interpretation of the monitoring data.

C. Personnel qualifications for instrument installation.

1. Employ qualified technicians with comparable experience in the installation of structural instrumentation similar to that specified herein.

2. Employ a Professional Engineer registered in the State of New York, with specialized experience in the installation of instrumentation specified herein, to supervise and direct technicians and be responsible for instrument installation. This person is to be present at the installation Site(s) to direct and supervise the installations.

D. Each instrument specified herein, shall be the product of an acceptable manufacturer currently engaged in manufacturing structural instrumentation hardware of the specified types.

E. As part of manufacturing quality control, a factory calibration shall be conducted on all instruments, where applicable, prior to shipment. Certification shall be provided to indicate that the test equipment used for this purpose is calibrated and maintained in accordance with the test equipment manufacturer's calibration requirements and that, where applicable, calibrations are traceable to the National Institute of Standards and Technology.

F. A final quality assurance inspection shall be made prior to shipment. During the inspection, a checklist shall be completed to indicate each inspection and test detail. A completed copy of the checklist shall be supplied with each instrument.

G. Surveyor Qualifications: Contractor's professional Land Surveyors shall be registered in the State of New York. The professional Land Surveyors shall establish all benchmarks, base stations, and the structural monitoring points and take baseline readings.

1.5 STRUCTURAL INSTRUMENTATION MONITORING SYSTEM TESTS

A. Test the Structural Instrumentation Monitoring System at least once per week during excavation and ISS implementation, and when instrumentation readings have not stabilized after the cessation of Site activities. Test the Structural Instrumentation Monitoring System by simulating data that exceeds Response Levels in the presence of the Engineer. An alert notification should not be issued during this weekly test.

B. Test the Alert Notification System for each user on the notification list by simulating an alert notice at least once per month, in the presence of the Engineer during the Work, and when instrumentation readings have not stabilized after the cessation of Site activities.

1.6 TOLERANCES

A. Survey measurements for initial location of each of the monitoring points shall consist of determining the elevation (NAVD88) and horizontal position (in state plane coordinate system) with respect to benchmark(s) established at the top of slope accepted by the Engineer.

B. The as-built survey coordinates of SMPs for horizontal position shall be determined to an accuracy of ±0.01 foot and the elevation to an accuracy of ±0.01 foot.

C. The seismographs shall have the following minimum features:

1. Seismic range: 0.01 to 4 inches per second with accuracy of ±5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inch per second or less.
2. Acoustic range: 110 to 140 dB (referenced to 20 micro-Pascals) with an accuracy and resolution of ±1 dB.
3. Frequency response (±3 dB points): 2 to 200 Hertz.

1.7 PROJECT AND SITE CONDITIONS

A. The instrumentation and monitoring included in this Specification shall be performed during excavation and ISS implementation. Note that depending on results of the pre-construction condition survey, instrumentation and monitoring may be required during other phases of the Work.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide all materials, including readout units, and remove following completion of the Work.

B. Minimum quantity and locations of instruments shall be determined by the Contractor based on the results of the Pre-Construction Survey.

C. Provide protection for all mounted Automated Monitoring equipment to prevent accidental damage and to inhibit theft or vandalism of the equipment.

2.2 SENSORS AND DATA ACQUISITION

A. Provide sensors and data logging units with remote access capability to collect data from structure monitoring points.

B. Provide data logging units with the appropriate sensor interface hardware and remote communications features to connect each sensor. Data loggers shall be capable of checking each sensor, except AMTS sensors, at least once every 2 minutes to determine whether the reading exceeds pre-established Response Levels. Data loggers shall automatically send data to the data management system. Readings which exceed Response Levels shall be flagged.

C. Provide lighting and protection and appropriate grounding for sensors and data logging units in full accord with manufacturer's recommendations.

D. Provide all connections of sensors to data loggers.

E. Provide all required supporting materials, such as power, radio, telephone connections, to keep data loggers duly functioning for the duration of the Contract.

F. Provide remote communication system to connect data loggers to the Structural Instrumentation Monitoring System with communications initiation features at both ends.

2.3 DATA COLLECTION AND MANAGEMENT SYSTEM

A. Provide a Structural Instrumentation Monitoring System, an integrated system that automatically collects data from the structural instrumentation and place it into a secure database. The database must also include all data from all manually read instruments and optical surveys. Engineer will be responsible for analysis and interpretation of the monitoring data.

B. The data management system shall be able to display current readings in engineering units for any sensor and the entire history of readings for that sensor via a secured web-based database system.

C. Provide the Structural Instrumentation Monitoring System with the following minimum

capabilities:

1. Collects and receives structural instrumentation data and stores all records into a database.
2. Makes available for reporting via the web interface within two (2) minutes or the minimum required collection cycle time (up to a maximum five (5) minutes) of the data being collected by dataloggers.
3. Immediately generates alert by email or text message to cell phone, as necessary, for a minimum of 10 addresses when data collected by any instrument is determined to be outside of the set tolerances.
4. Upon the occurrence of a Response Level, all sensors in the system shall be read and the results made available on the web interface in five (5) minutes.
5. Logs all alerts in the database for subsequent reporting.
6. Alert message shall include the identifier of the instrument exceeding the Response Level, the data and time of the reading, and the value of the reading in engineering units.
7. Provide capability for person receiving alert to acknowledge it and to disarm subsequent alert from that sensor.
8. Provide messages to users whenever any part of the Structural Instrumentation Monitoring System and structural instrumentation is not fully functioning.

D. Provide a web-based user interface that can be run from any web browser to allow a complete review of project data that includes the following:

1. Password protection access and different user levels.
2. Shows graphically the monitoring points and locations in relation to relevant project features (i.e. existing structures).
3. Displays all data collected since the beginning of the project for any/all instruments for the time period indicated by the user.
4. Provides the user with ability to view data in either raw or engineering units.
5. Displays a summary report of the current active alerts from all active instruments with current Response Levels in different colors.
6. Supports exports of reports to comma-delineated and XML formats for import into other applications.
7. Provides printed reports, either formatted to a printable screen or outputted as a printable version.

E. The Engineer will provide a list of contacts to the Contractor at the time of the submittal to include on the above notifications and to provide access to the web-based user interface.

2.4 SYSTEM REQUIREMENTS

A. Contractor shall furnish, install, and support all network electronics, software, cables and components necessary for the Structural Instrumentation Monitoring System to receive, store, analyze, transfer, display and report data for the duration of the Contract. The system must be capable of supporting additional monitoring instruments if they become necessary.

B. Dataloggers shall have prior demonstration of reliability and performance through at least 2 applications where data loggers have been integrated into a web-based reporting system.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Install instruments (required for installation by Contractor) at locations accepted by the Engineer in accordance with the accepted installation plan. The Engineer may modify instrument locations depending on field conditions and monitoring objectives. Install all instrumentation in accordance with the approved installation schedule.

B. Measure baseline vibration levels from daily operations on-site prior to start of construction and submit for review by the Engineer at least one (1) week prior to start of the Work.

C. All instruments shall be clearly marked, labeled, and protected to avoid being obstructed or otherwise damaged by construction operations or the general public. Both protective housing and box or vault covers shall be marked.

D. A unique instrument identification number shall be assigned to each instrument and each point. The instrument identification number shall be clearly marked on each instrument in a non-destructible manner.

E. Surveying: Immediately following installation, the location of the top of all instruments shall be surveyed to provide horizontal and vertical coordinates. The survey measurements shall consist of determining the elevation and horizontal position of each of the Monitoring Points and other instrumentation elements with respect to benchmark(s) accepted by the Engineer. Resurveying shall be required at least monthly or as required by the Engineer.

F. Initial Reading: Immediately following instrument installation, Contractor shall take two sets of initial readings to provide baseline readings and to demonstrate the adequacy of the completed installation.

3.2 MONITORING POINTS

A. Monitoring Points shall include SMPs and seismographs. Monitor these control points using surveying methods. Contractor should use AMTS for monitoring of these points.

1. AMTS shall be installed where a direct line of sight can be established to measure all SMPs and seismographs.

2. Identify all locations, permits (if needed) and methods necessary to install AMTS.

B. Submit a plan of the proposed monitoring points for approval by the Engineer.

C. SMP Locations:

1. Provide a stainless steel bolt and/or an adhesive-backed target.

2. Provide reflective glass prism, housing, and mounting bracket within automated monitoring areas.

3. After completion of installation, establish an initial reading. An initial reading for a SMP will consist of three (3) readings with 24 hours minimum between readings.

4. At a minimum, a set of three SMPs shall be installed at each of the following existing structures (i.e., 3 SMPs at every structure):

   a. Pedestrian walkway;

   b. Adjacent Commercial Building, and

   c. Other structures specified by Owner and/or Engineer.

D. Seismograph Locations:

1. Baseline background seismograph readings shall be taken prior to the beginning of construction activities. Baseline readings on facilities shall consist of a minimum of 7 days of continuous monitoring of single-component peak particle velocities, which shall be printed on a strip chart. During this period, Contractor shall document all events that are responsible for the measured vibration levels. Particle velocities shall be read with a minimum sensitivity of 0.01 inch/second.

2. Contractor shall collect seismograph data prior to construction activities to document background vibrations, and also at the start of construction activities to establish the maximum energy which can be used without surpassing acceptable vibration levels at nearby facilities. Contractor shall also monitor vibration during construction. Contractor shall notify the Owner at least 24 hours prior to starting any new operations suspected of being capable of inducing vibration.

3. Provide portable seismographs for monitoring the velocities of ground vibrations resulting from Work activity. The seismographs shall have the following minimum features:

    a. Three channels for vibration monitoring.

    b. Two power sources: internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for a minimum of 24 hours.

    c. Capable of internal dynamic calibration.

    d. Self-triggering wave form capture mode that provides the following information: plot of wave forms, peak particle velocities, peak overpressure, frequencies of peaks.

    e. Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of 1 minute or less.

    f. At a minimum, one seismograph shall be placed at an accessible location at each of the following existing structures as shown on the Drawing:

        i. Pedestrian walkway;

        ii. Adjacent Commercial Building, and

        iii. Other structures specified by Owner and/or Engineer.

E. Clearly identify all monitoring points with permanent easily readable letters and numbers in the field.

F. Notify the Engineer within 1 hour of any Action or Maximum Level exceedance defined in this Specification.

3.3 OPERATION

A. Data loggers and the Structural Instrumentation Monitoring System shall operate 24 hours a day, 7 days a week, for the duration of the project (after installation and testing) and provide immediate access to all stored data for any anyone given password access to the system. Contractor shall provide the Owner with such access.

B. The Owner reserves the right to order a work stoppage any time the Structural Instrumentation Monitoring System is not sufficiently functional to serve the needs of the project. The Owner will authorize restarting the work once the Structural Instrumentation Monitoring System has been restored. Contractor will not be entitled to extra compensation or extra time for such work stoppage.

C. Data for sensors shall be logged at time intervals established and reviewed with the Engineer.

D. Data stored in the data loggers shall be maintained in the data loggers' memory for at least 7 days to permit restoration of any information lost by the Structural Instrumentation Monitoring System

3.4 DATA COLLECTION AND REPORTING FREQUENCY

A. Record readings from structure monitoring points, and seismographs shall be recorded a minimum of once per hour. Crack gauges, if required, shall be physically monitored and changes recorded on a daily basis.

B. All reports shall be generated by an authorized user via a web interface.

C. Submit to the Engineer a daily instrumentation report in Adobe Acrobat format at the end of each working day. For weekend or holidays where no work in performed, provide a single instrumentation report, by 10:00 am ET the following business day. The report shall be formatted to a printable version, and shall include the following:

1. Tabulation of readings exceeding the Response Levels, date and time and relevant comments on construction activity that may be related.
2. Current status of any components of the Structural Instrumentation Monitoring System that malfunctioned.
3. Time history plots of structural instrumentation readings for monitoring existing structures. If monitoring data for existing structures show that no changes have occurred from the baseline, include a statement to that effect.
4. Any corrections, changes or additions to a previous report filed with the Engineer.
5. Record reports shall be maintained in an on-line database organized so that it can be immediately identified and retrieved for the duration of the Contract. At the completion of the Contract, a readable electronic copy of all record reports shall be provided to the Engineer.

3.5 RESPONSE VALUES

A. The Action and Maximum levels for instrumentation at existing structures are summarized in the table below:

Structures	Precautionary Level	Action Level	Maximum Level
Pedestrian Walkway	Vertical Movement[1] = 0.5 in Horizontal Movement[1] = 0.5 in Vibration[2] = 1.0 in/sec	Vertical Movement[1] = 0.75 in Horizontal Movement[1] = 0.75 in Vibration[2] = 1.2 in/sec	Vertical Movement[1] = 1.0 in Horizontal Movement[1] = 1.0 in Vibration[2] = 2.0 in/sec
Adjacent Commercial Building	Vertical Movement[1] = 0.5 in Horizontal Movement[1] = 0.5 in Vibration[2] = 1.0 in/sec	Vertical Movement[1] = 0.75 in Horizontal Movement[1] = 0.75 in Vibration[2] = 1.2 in/sec	Vertical Movement[1] = 1.0 in Horizontal Movement[1] = 1.0 in Vibration[2] = 2.0 in/sec

1. *Where SMPs are installed*
2. *Where seismographs are installed. Upon review of baseline readings, baseline vibrations (if higher) may be used in lieu of the indicated PPVs.*

B. These values will be revisited by the Engineer after Contractor measures and submits baseline vibrations in accordance with Article 3.1B.

C. If an action level is reached:

1. Engineer and Contractor shall meet to discuss remedial measures.
2. Increase the instrument monitoring frequency as directed by the Engineer.
3. Install and monitor additional instruments as directed by the Engineer.
4. Take all necessary steps so that the Maximum Level is not exceeded.
5. Contractor may be directed to suspend activities in the affected area except for those actions necessary to avoid exceeding the Maximum Level.

D. If a Maximum Level is reached, all work shall stop and the Site secured until remedial measures have been submitted and approved by the Engineer.

3.6 INSTRUMENTATION PROTECTION, MAINTENANCE AND REPAIR

A. Maintain and protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation systems from damage due to construction operations, weather, traffic, and vandalism.

B. If an instrument is damaged, repair or replace the damaged instrument at no additional cost to the Owner. The Engineer will be the sole judge of whether repair or replacement is required. The Engineer may impose a work stoppage near the damaged instrument until it is again operational, at no additional cost to the Owner.

3.7 DECOMMISSIONING OF INSTRUMENTS

A. Remove salvageable instruments only when directed by the Engineer.

B. All data loggers, monitoring hardware & software, portable instruments, handheld readout units and AMTS units will be salvaged and remain property of Contractor.

** END OF SECTION 13091 **

APPENDIX C
GROUNDWATER MODELING RESULTS

WEST 45 STREET NYC FORMER MPG SITE OU2 GROUNDWATER MODELING MEMORANDUM

CONSTRUCTION, CALIBRATION, AND DESIGN SCENARIOS

Prepared for:



CONSOLIDATED EDISON CO. OF NEW YORK, INC.

31-01 20th Avenue

Long Island City, NY 11105

Prepared by:

PARSONS

July 2023

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Figure 3 Potentiometric Surface Map Post - In Situ Stabilization

Figure 4 Difference in head – Pre and Post - In Situ Stabilization

1.0 INTRODUCTION

1.1 Purpose

This document describes groundwater flow modeling to provide hydrogeologic support for remedial scenarios for the Con Edison West 45th Street Former MPG site OU2 (Site). The model was built following the principle of parsimony, by using the simplest model structure and adding complexity only as necessary to explain Site groundwater conditions.

The primary objectives for development of the groundwater model for the Site are as follows:

1. Quantify groundwater flow conditions prior to implementation of In Situ Stabilization (ISS) activities at the Site.
2. Develop a predictive scenario to support a quantitative understanding of the changes in hydrogeological conditions after implementation of ISS.

Using data collected during the previous investigations, a numerical finite difference groundwater model was developed, constructed, and calibrated (with sensitivity testing) to simulate groundwater flow conditions, and to identify groundwater particle paths and associated velocities for the Site. The purpose of the model is to evaluate groundwater flow qualitatively and quantitatively at the Site, with specific relevance to the ISS remedial scenario. The steady state model was calibrated to one set of synoptic water levels using existing and new groundwater hydraulic information (transmissivity, regional gradients, aquifer architecture, potential for tidal influences, etc. collected during SRI field activities). During the modeling phase, calibration was performed to the extent practicable with the limited Site data in order to provide reassurance in the predictive scenario.

The preliminary groundwater modeling addressed two conditions at the Site:

- Calibration – modelled existing subsurface conditions at the Site.
- Scenario 1 – modelled subsurface conditions at the Site with ISS implementation.

1.2 Approach

This report provides the results of the groundwater modeling to develop a model to allow for predicting GW flow conditions post ISS.

2.0 MODEL DESIGN

2.1 Model Code

MODFLOW-USG and MODPATH-3DU were used for this groundwater modeling effort. MODFLOW-USG is being used for steady state flow only simulations and groundwater flow paths are delineated using MODPATH-3DU. Both models are well-known, well-documented, and in the public domain. ESI's Ground Water Vistas (Version 2) was used as the graphic user

interface (GUI) to manage pre- and post-process data. For flow-only testing, the MODFLOW-USG model used the Layer Property Flow package. Since the model was built to simulate steady state flow only, there are no solvers included for advection, dispersion, retardation, or degradation. To improve the calibration process and complete sensitivity testing, the well-known and documented Parameter ESTimation tool (PEST) was used (Doherty, 2010).

All final MODFLOW model runs exhibited 0.0 percent (%) water balance error, indicating that a sufficiently accurate solution of the flow problem was achieved. This is a check on the internal numerical solution and differs from model calibration processes and accuracy of the model relative to real world conditions; see calibration section of detail on model comparison to measured values. A water balance error less than 1% is considered acceptable for this type of model (Anderson and Woessner, 1992).

2.2 Model Domain, Grid and Boundary Conditions

A finite difference grid telescoped from 10-foot x 10-foot cells in the area of interest to a maximum size of 100 feet x 100 feet. The area covered 116,000,000 square feet (ft2) of active area with 188,566 active cells. The vertical domain was discretized in seven layers to a depth of -40 feet mean sea level.

2.3 Boundary Conditions

Multiple MODFLOW packages were included in the model to create boundary conditions and simulate groundwater flow. These include: Recharge Package, Drain Package, River Package, CLN head, and General Head Package. The River package was used to simulate the Hudson River. The general head package simulated recharge areas southeast of the site identified on aerial photography. The drain package simulated potential leaking sewers near the site. The CLN head was used to reproduce elevated heads associate with a geological lineament identified during investigations.

The Recharge Package simulated vertical recharge to the water table as a means of precipitation as well as evapotranspiration in regions of shallow water table conditions and heavy vegetation.

2.4 Model Calibration

Initially the hydraulic conductivity assigned a value of 4 to 6 ft/day and through manual and Parameter Estimation Tool (PEST) calibrations it was revised to range from 4 to 7 ft/day.

Calibration statistics are provided on Figure 1. A total of ten monitoring well measurements were used as targets in the static condition calibration. Weighting of calibration targets was conservatively used in the calibration. The initial model was calibrated through trial-and-error techniques to lower the residual error (target water level elevation minus that simulated) both statistically and qualitatively in the areas of interest. The calibration goals for the groundwater model are scaled root mean squared error of hydraulic head less than 0.1 (dimensionless) and reduced sum of squared residuals (head) to the extent practical.

Initially manual calibration techniques were used along with site specific observations regarding hydraulic conductivity zones based on drilling observations and aquifer pumping tests. After the initial manual calibration, the well-known and documented PEST was used to further refine the calculated parameters and test sensitivities for hydraulic conductivity, recharge, and evapotranspiration.

3.0 RESULTS

Figures 2 through 4 illustrate the results from each scenario and are summarized here:

Figure 2: Existing Conditions:

- The groundwater flow under existing conditions mounds on the eastern side and mostly travels to the northwest towards the river.

Figure 3: Subsurface ISS:

- When groundwater at the Site is modeled to include the ISS monolith, groundwater mounding occurs within the footprint of the ISS monolith, and to the southwest of the ISS monolith. Within portions of the Site outside of ISS monolith groundwater particles flow to the west at gradients lower than existing conditions. In areas outside of the Site groundwater particles flow around the Site.

Figure 4: Difference between current conditions and ISS

- Groundwater heads change due to the lower hydraulic conductivity of the subsurface once ISS is implemented. After implementation of ISS the heads decrease from -1 to -3 feet at the site.

4.0 ASSUMPTIONS

The following assumptions were made for the model:

- It was assumed that the ISS can be installed as established in the groundwater model and there is no leakage through weaknesses or imperfections in the design or construction.

- Recharge can be further reduced to eliminate any mounding and ponding of water within the parking lot barrier walls.

- There is no anthropogenic input of water such as leaking piping or sewers.

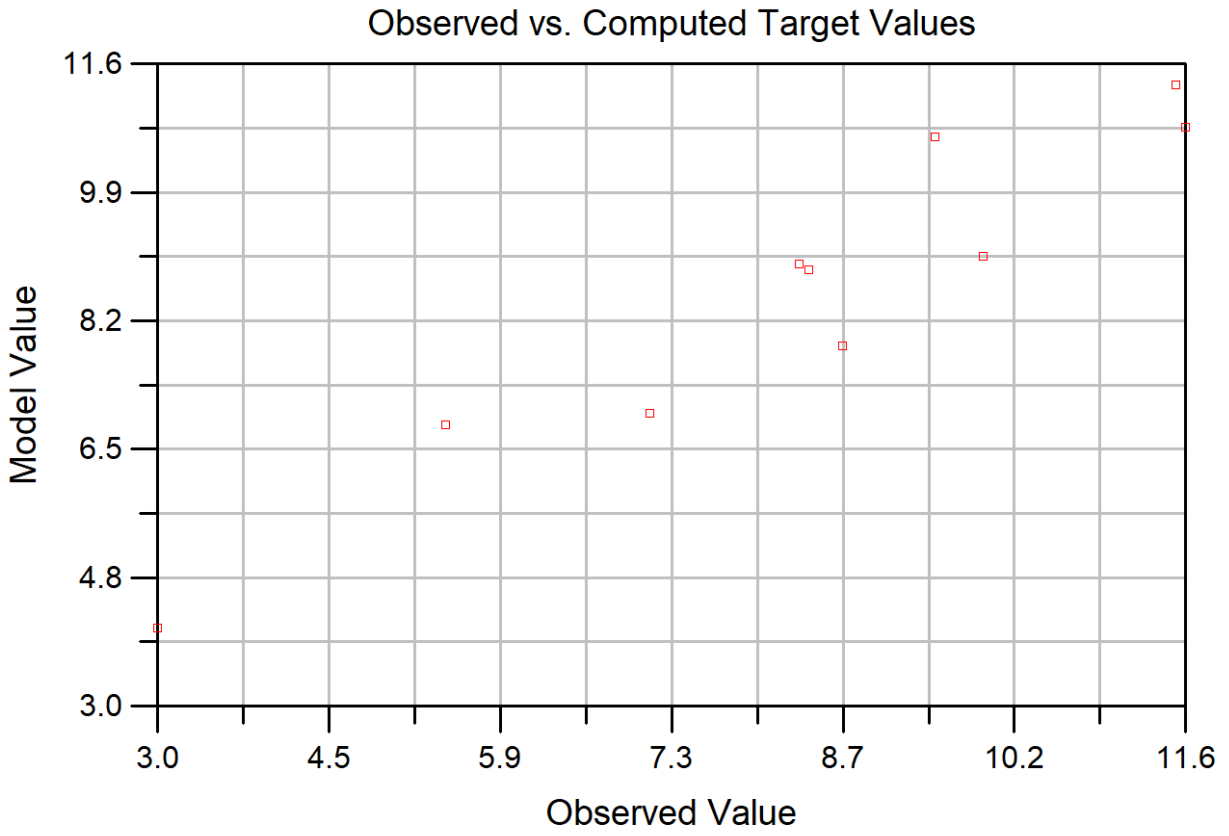
- Recharge in the region is low at approximately 1-2 inches/year due to paving and buildings.

5.0 REFERENCES

Anderson, M.P. and W.W. Woessner, 1992. Applied Groundwater Modeling - Simulation of Flow and Advective Transport. Academic Press, Inc., San Diego, California

Doherty, John E. and Hunt, Randall J. (2010) Approaches to Highly Parameterized Inversion: A Guide to Using PEST for Groundwater-Model Calibration, Scientific Investigations Report 2010–5169, U.S. Department of the Interior U.S. Geological Survey.

FIGURES



Target Statistics

Target	Residual	Name
11.51	0.20	PW-1
11.59	0.84	MW-24
3.05	-1.04	MW-2
5.44	-1.34	PW-2
7.14	0.19	MW-1
8.38	-0.55	MW-4
8.46	-0.39	MW-6
8.74	0.90	MW-19
9.51	-1.11	MW-5

Residual Mean	= -0.14
Residual Standard Dev.	= 0.82
Absolute Residual Mean	= 0.74
Residual Sum of Squares	=6.94e+00
RMS Error	=0.83
Minimum Residual	= -1.34
Maximum Residual	= 0.90
Range of Observations	= 8.54
Scaled Res. Std. Dev.	= 0.096
Scaled Abs. Mean	= 0.087
Scaled RMS	= 0.098
Number of Observations	= 10

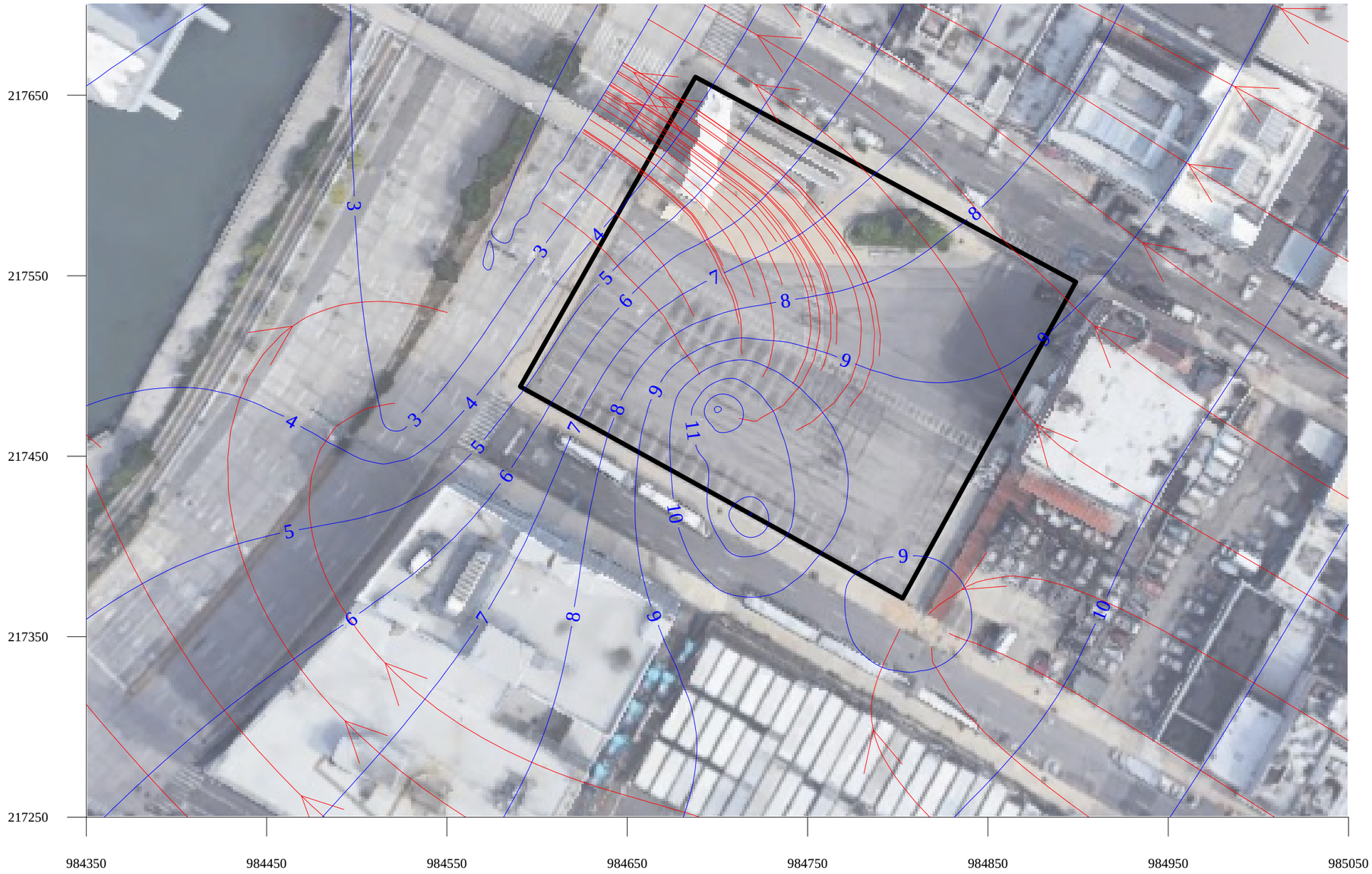
FIGURE 1

CON EDISON
West 45th Street
New York, NY

CALIBRATION STATISTICS

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Buffalo, NEW YORK 14202



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Buffalo, NY 14202
(716) 541-0730

Created by: KMW	Date:	3/7/22
Checked by: JWS	Date:	3/7/22
Job number: 452727.02000		

LEGEND

PROPERTY BOUNDARY

1AR3 WELL ID

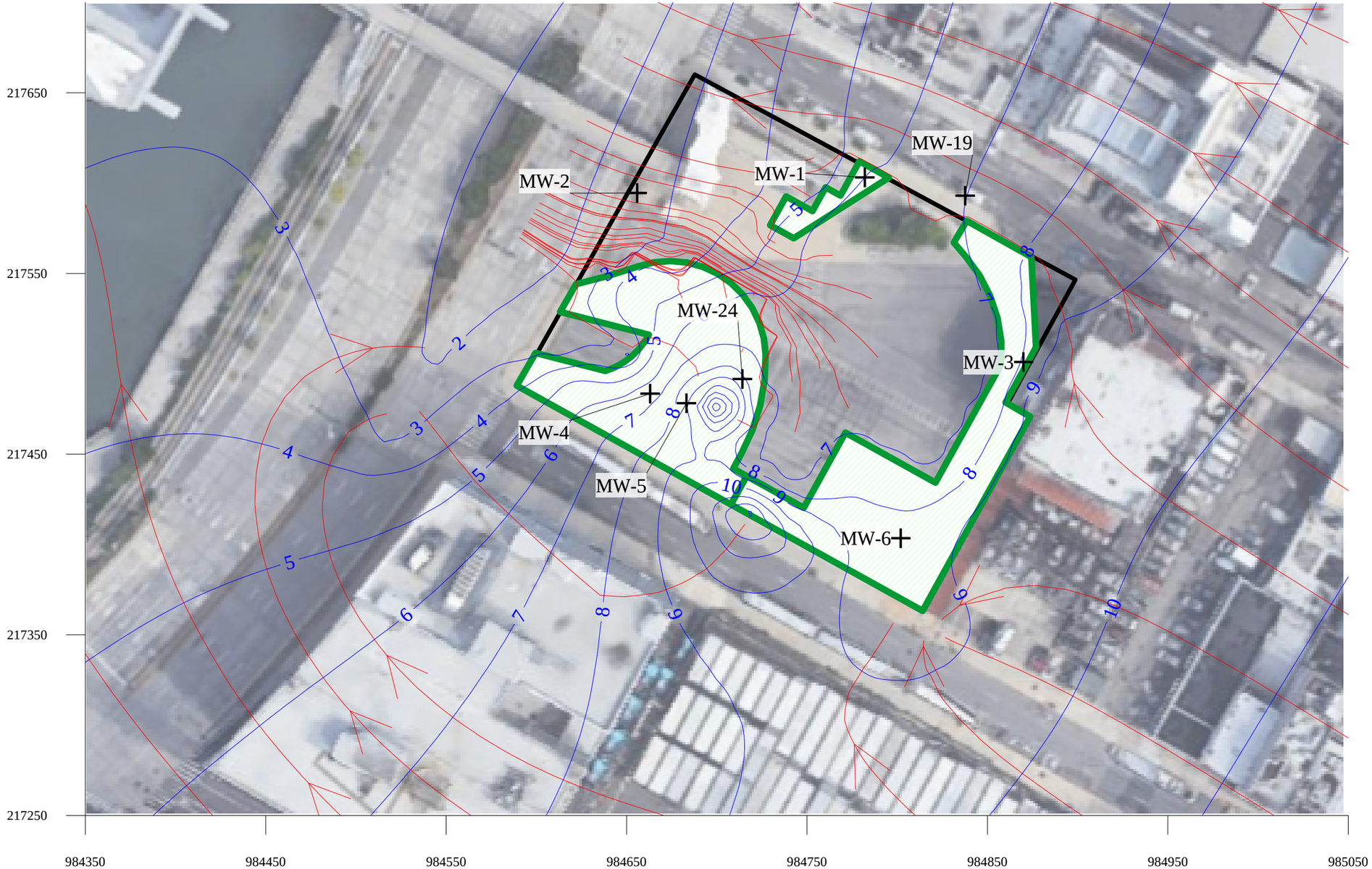
\+ MONITORING WELL

GROUNDWATER CONTOUR (FT AMSL)

Model Particle Path

IN-SITU STABILIZATION

FIGURE 2
POTENTIOMETRIC SURFACE MAP PRE-CONSTRUCTION
West 45th Street, Manhattan, NY



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LEGEND

- PROPERTY BOUNDARY
- 1AR3 — WELL ID
- \+ — MONITORING WELL
- GROUNDWATER CONTOUR (FT AMSL)
- Model Particle Path
- IN-SITU STABILIZATION

FIGURE 3
POTENTIOMETRIC SURFACE MAP POST - IN SITU STABILIZATION (ISS)
West 45th Street, Manhattan, NY



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Job number: 452727.02000

LEGEND

- PROPERTY BOUNDARY
- 1AR3 WELL ID
- + MONITORING WELL
- GROUNDWATER CONTOUR (FT AMSL)
- Model Particle Path
- IN-SITU STABILIZATION

FIGURE 4
POTENTIOMETRIC SURFACE MAP
DIFFERENCE IN HEAD
POST ISS INSTALLATION
West 45th Street, Manhattan, NY

WEST 45 STREET NYC FORMER MPG SITE OU-2 GROUNDWATER MODELING MEMORANDUM

GROUNDWATER CONDITIONS POST-ISS IMPLEMENTATION

Prepared for:



CONSOLIDATED EDISON CO. OF NEW YORK, INC.

31-01 20th Avenue

Long Island City, NY 11105

Prepared by:

PARSONS

July 2024

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4.0 IMPACT OF POST-ISS GROUNDWATER FLOW AT OU-2 ON OU-1 2
5.0 POST-ISS MONITORING WELL NETWORK 2
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Figure 1 Potentiometric Surface Map Post - In Situ Stabilization
Figure 2 Average Linear Velocity Comparison

1.0 INTRODUCTION

This document provides additional details regarding a groundwater flow model for the selected remedy under the Remedial Design Work Plan Summary Report (RDWPSR), conditionally approved by NYSDEC on July 12, 2024, for the Con Edison West 45th Street Former MPG site OU-2 (Site). This update considers the impacts of in-situ stabilization (Post-ISS) on groundwater flow to further describe the modeled groundwater scenario in support of effective groundwater migration monitoring of impacts post-ISS. Specifically, the goal of this memorandum is to determine and evaluate changes in groundwater hydraulics (flow patterns and elevation) such that any potential negative impacts could be identified and appropriate monitoring mechanisms could be considered.

As presented in the RDWPSR, using data collected during the previous investigations, a numerical finite difference groundwater model was developed, constructed, and calibrated (with sensitivity testing) to simulate groundwater flow conditions, and to identify groundwater particle paths and associated velocities for the Site. The purpose of the model was to evaluate groundwater flow qualitatively and quantitatively at the Site, with specific relevance to the ISS remedial scenario.

The preliminary groundwater modeling addressed two conditions at the Site:

- Calibration – modelled existing subsurface conditions at the Site.
- Scenario 1 – modelled subsurface conditions at the Site post-ISS construction.

The focus of this memo is to provide further details from the model on Scenario 1, and to determine the effectiveness of the chosen locations for downgradient monitoring wells for the SMP.

2.0 MODEL DESIGN

MODFLOW-USG and MODPATH-3DU were used for this groundwater modeling effort. The model design, including the model code, domain, grid, boundary conditions, and calibration are discussed in detail in the modeling memorandum provided in the RDWPSR.

The following assumptions were made for the model:

- It was assumed that the ISS can be installed as established in the groundwater model and there is no leakage through weaknesses or imperfections in the design or construction.
- Recharge can be further reduced to eliminate any mounding and ponding of water within the parking lot barrier walls.
- There is no anthropogenic input of water such as leaking piping or sewers.

- Recharge in the region is low at approximately 1-2 inches/year due to paving and buildings.

3.0 RESULTS

Figure 1 illustrates the results from the Post-ISS modeling scenario provided in the RDWPSR. Figure 2 shows a comparison of the average linear particle velocities across both the pre-ISS and post-ISS models, measuring 794 particle velocity tracks across shallow and deep groundwater. As shown in Figure 1, the remedial design will result in no increase in mounding outside the ISS area (<1.0 foot). Additionally, after reviewing the particle velocities it was determined that there will be:

- No significant increase in groundwater velocities
- Minor decreases in average velocities due to removal of flow through the system

4.0 IMPACT OF POST-ISS GROUNDWATER FLOW AT OU-2 ON OU-1

A condition of the approval for the RDWPSR was the installation of additional monitoring wells south of West 44th Street to monitor potential impacts from OU-1 based on the assumption that OU-2 groundwater flow changes could impact the migration of contaminants on OU-1. As shown on Figure 1, the model does not indicate significant flow towards the south from OU-2 to OU-1, and the modeled particle paths indicate that groundwater through OU-1 is anticipated to continue to flow to the northwest. Additionally, as shown on Figure 2, groundwater velocities are expected to decrease in the Post-ISS scenario, minimizing potential effects of groundwater flow around OU-2 on OU-1.

5.0 POST-ISS MONITORING WELL NETWORK

Based on this additional information presented, related to the existing hydrogeological model, the modeled particle path is parallel to West 44th Street flowing northwest (with the exception of the existing mound along the west side of OU-2). The addition of three monitoring wells south of West 44th Street may not provide any additionally beneficial information related to the monitoring of downgradient impacts from OU-1 post-ISS at OU-2.

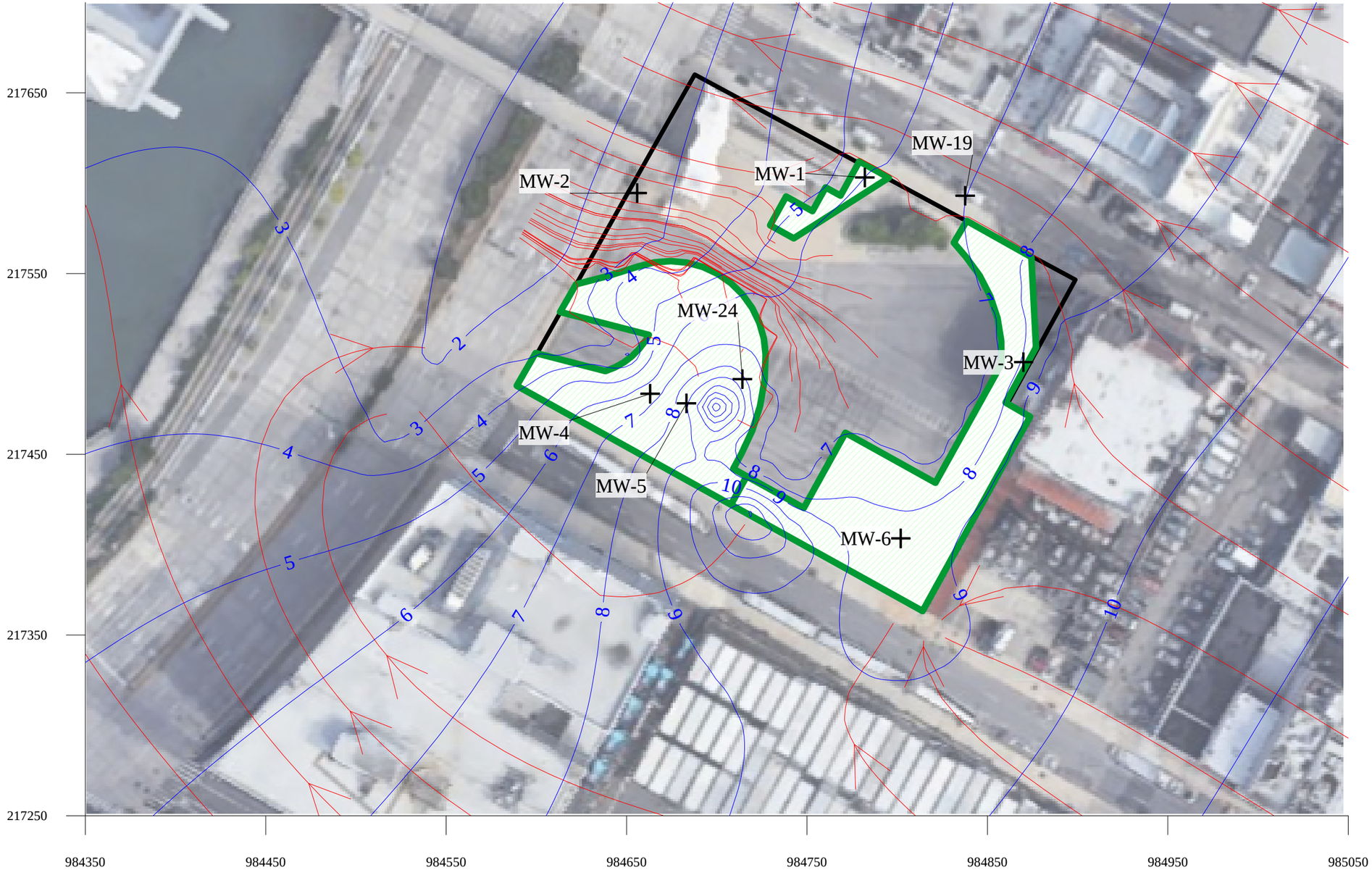
The current groundwater monitoring well network will be used under the future SMP to continue to monitor changes in groundwater, and if conditions change, or do not appear to be following the modeled scenario, additional groundwater monitoring wells may be installed based on actual conditions.

6.0 REFERENCES

Anderson, M.P. and W.W. Woessner, 1992. Applied Groundwater Modeling - Simulation of Flow and Advective Transport. Academic Press, Inc., San Diego, California

Doherty, John E. and Hunt, Randall J. (2010) Approaches to Highly Parameterized Inversion: A Guide to Using PEST for Groundwater-Model Calibration, Scientific Investigations Report 2010–5169, U.S. Department of the Interior U.S. Geological Survey.

FIGURES



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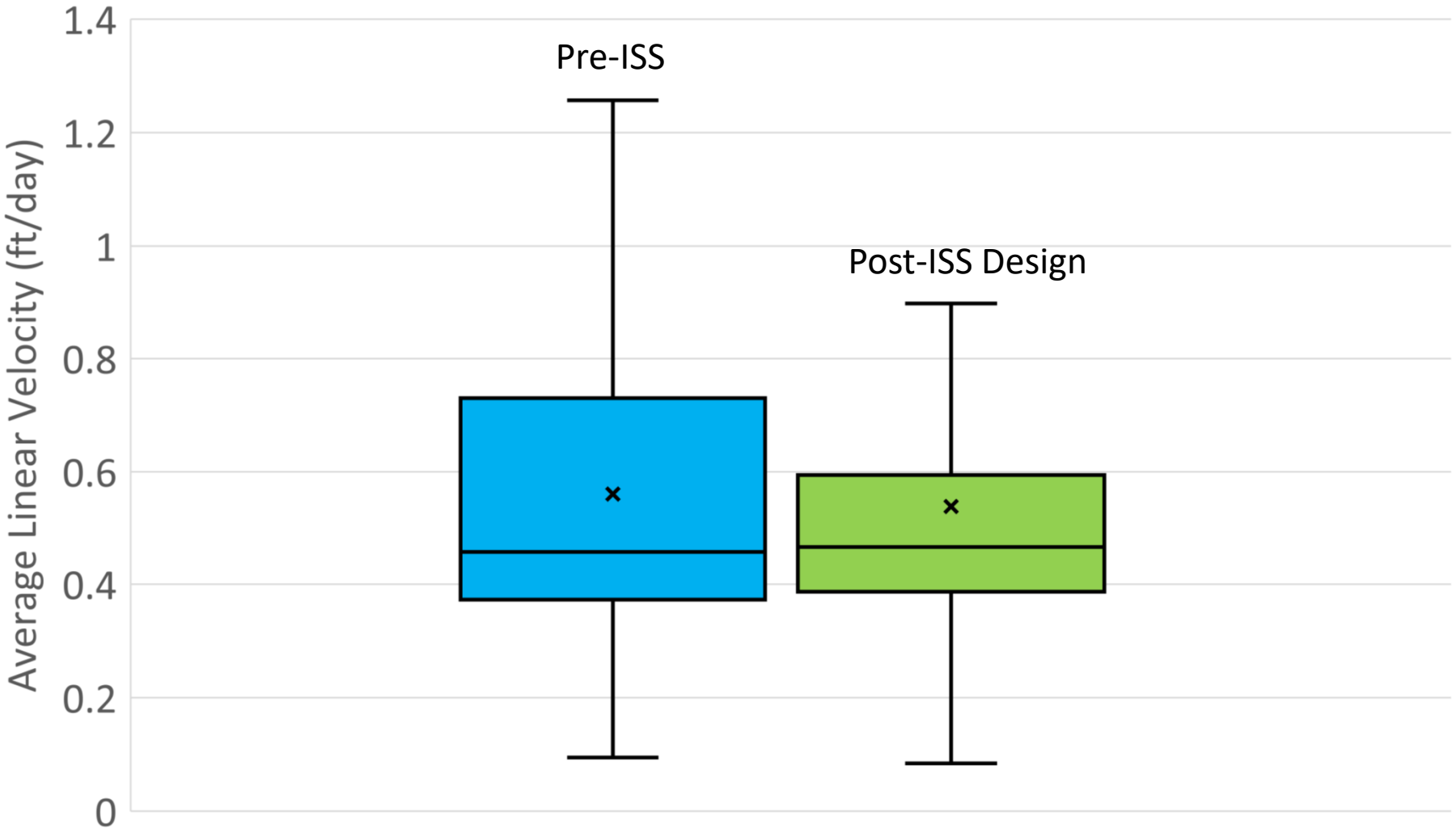
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Checked by: JWS	Date: 3/7/22

Job number: 452727.02000

LEGEND

- PROPERTY BOUNDARY
- 1AR3 — WELL ID
- \+ — MONITORING WELL
- GROUNDWATER CONTOUR (FT AMSL)
- Model Particle Path
- IN-SITU STABILIZATION

FIGURE 1
POTENTIOMETRIC SURFACE MAP POST - IN SITU STABILIZATION (ISS)
West 45th Street, Manhattan, NY



CONSOLIDATED EDISON CO.
OF NEW YORK, INC.

Figure 2. Average Linear Velocity Comparison

APPENDIX D
BORING LOGS

Soil Boring Log

CLIENT: Con Ed
PROJECT NAME: 345th SIPT
PROJECT LOCATION: NY
PROJECT NUMBER:
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

INSPECTOR: AFM
DRILLER: RJ
WEATHER:
CONTRACTOR: ADT
RIG TYPE:
DATE/TIME START: 0800 10-5-22
DATE/TIME FINISH: 1015 10-5-22
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SPD1-1
LOCATION DESCRIPTION:
LOCATION PLAN

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.5 Asphalt		start HC @ 1210 9/19/22 — 1st attempt refusal @ 2.5'
			0.0	0.5 - 1.0 dry, m. dense, brown, f-c SAND, trace subangular gravel (compacted)		
_1			0.0			
			0.0			
_2			0.0	1.0 - 2.0 dry, dense, brown, f-c SAND, trace subangular gravel		2nd attempt 9/20/22 @ 0730
			0.0			
_3			0.0	- mica schist boulder @ 3.0', fill		
			0.0	2.0 - 5.0 SAA, moist		
_4			0.0			switch pipe 5.0' HC @ 1200
			0.0			
_5		5.0		5.0 - 7: NR		
				7-9.5: m dense, dark brn f-c sand, trace angular gravel		
_6						
_7			0.6	9.5-10: m dense, dark brn f-c sand, large rock in core		
			0.4			
_8			0.0			
			0.0			
_9			0.2			
			0.0			
10	Notes					

Sample Types
S -- Split Spoon
A -- Auger Cuttings
U -- Undisturbed Tube
C -- Rock Core

Field Identification Notes
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:
PROJECT NAME:
PROJECT LOCATION:
PROJECT NUMBER:

GROUNDWATER OBSERVATIONS

WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR:
RIG TYPE:
DATE/TIME START:
DATE/TIME FINISH:
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SB02-1

LOCATION DESCRIPTION:

LOCATION PLAN

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0	0.0			
1						
2						
3						
4						
5		5.0	0.0			
6						
7						
8						
9						
10	Notes:					

Sample Types
S -- Split Spoon A – Auger Cuttings
U – Undisturbed Tube
C – Rock Core

Field Identification Notes:
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages:
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

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CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPD1-1
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:	WEATHER:	
PROJECT NUMBER:	CONTRACTOR:	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1_0		4.0/5.0	–	10-11: NR		
			–	11-12: SAA		
1_1			0.0			
			3.5	12-13: 100% light grey Silty Sand, large angular gravel, some fine angular gravel		
1_2			0.6			
			0.8			
1_3			0.2	13-13.5: Brown firm silt, some fine angular gravel		
			4.3			
1_4			8.8			
			1.2	13.5-15: U firm, brown, wet Silty Clay		
1_5		3.0/5.0	–			
			–			
1_6			–			
			–	15-17: NR		
1_7			0.0	17-20: U firm, brown wet Silty Clay, mica flakes, little fine sand		
			0.0			
1_8			0.3			
			0.6			
1_9			0.6			
			0.1			
2_0	Notes:		0.0			

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SP01-1
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	
GROUNDWATER OBSERVATIONS		RIG TYPE:	LOCATION PLAN
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH: 1015	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
2_0		5.0/5.0	0.0	20-26': v Dense Brown fine sand, Silt + Clay, trace angular gravel, trace, sub angular gravel		
			0.0			
2_1			0.0			
			0.0			
2_2			0.0			
			0.0			
2_3			0.0			
			0.0			
2_4			0.0			
			0.0			
2_5		4.0/6.0	0.0	25-28.5: Silt		
				28.5-29': Grey v Dense Clay		
2_6						
2_7						
2_8				29': Bed rock		
				29': EOB, backfilled		
2_9				collected SC, SM		
3_0	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings U -- Undisturbed Tube C -- Rock Core	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50% some - 20-35% little - 10-20% trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFM	BORING/WELL NO.: SPDI-2
PROJECT NAME: 145th SPDI	DRILLER: RJ	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: ADT	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START: 10/12/22 @ 0830	SC Soil
DATE:	DATE/TIME FINISH:	18-24
TIME:	WEIGHT OF HAMMER: Not Applicable	clayey sand (w/ gravel)
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		HC start 9/23/22 @ 1000
			0.0	0.8 - 5.0 moist, m. dense, brown, fine SAND, trace silt, trace subangular gravel		
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			16.4			9/23/22 HC to 5.0 @ 1330 1/3
			31.2			9/26/22 HC to 50 @ 0950 2/3 ! 3/3
_5		5.0/5.0	0.3	5.0 - 10.0 Brick (solid, red) powder, concrete		Start drilling 10/12/22 @ 0830
			0.8			
_6			0.7			
			0.6			
_7			0.7			
			0.2			
_8			0.8			
			1.0			
_9			0.5			
			0.0			
_10	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPDI-2
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:	WEATHER:	
PROJECT NUMBER:	CONTRACTOR:	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0/5.0	1.8	10.0 - 15.0 Brick / concrete powder		
			0.9			
11			0.2			
			0.5			
12			1.1			
			0.6			
13			1.7			
			1.8			
14			2.0			
			2.6			
15		5.0/5.0	1.0	15.0 - 16.0 SAA		
			1.3			
16			1.1	16.0 - 20.0 (AFM) ~~Silt~~ moist, v. dense, red brown, (AFM) ~~sand~~ SAND and silt		
			0.9			
17			2.0			
			1.9			
18			2.8			
			2.6			
19			3.3			
			3.6			
20	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	SPDI-2
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
20		5.0/5.0	2.8	20.0 - 22.0 SAA		
			2.8			
21			0.5			
			1.4			
22			2.3	22.0 - 23.0 concrete		
			11.8			
23			12.4	23.0 - 25.0 moist, m. dense, black,		v. light
			19.0	fine SAND, little silt		odor
24			18.2			
			5.1			
25		-/5.0		25.0' EOB		
				collected SP-SM		
26						
27						
28						
29						
30	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFR	BORING/WELL NO.: SPDI-3
PROJECT NAME: W 45th SPDI	DRILLER: AJ	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: AOR	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START: 10/11/22 @ 1120	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		Start HC 1045 on 9/26/22
			0.0	0.8 - 5.0 moist, m. dense, brwn, fine SAND, trace subangular gravel		
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			18.1			5.0 @ 2 location 1030 9/27/22
			23.0			
_5		0.0/5.0	-	5.0 - 10.0 no recovery		start drill 10/11/22 @ 1120
			-			
_6			-			
			-			
_7			-			
			-			
_8			-			
			-			
_9			-			
			-			

1.0 Notes

Sample Types	Field Identification Notes	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	SPOT-3
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:	LOCATION PLAN	
GROUNDWATER OBSERVATIONS	RIG TYPE:		
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		3.0/5.0	1.0	10.0 - 13.0 wet, m. dense, dark brown, f-c SAND, some subangular gravel		
			0.9			
11			0.8			
			1.0			
12			1.2			
			3.6			
13			-	13.0 - 15.0 no recovery		
			-			
14			-			
			-			
15		30/60	0.1	15.0 - 17.0 SAA, sm SAND, some silt	rem	
			0.8			
16			0.6			
			4.5			
17			4.1	17.0 - 18.0 rock	rock	For study: 6ft-6in, poorly graded gravel with (and sand)
			4.6			
18			-	18.0 - 20.0 no recovery		
			-			
19			-			
			-			
20	Notes					

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	SPDI - 3
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
20		5.0/5.0	58.3	20.0 - 21.0 brick fragments		
			36.9			sheen 21.5-23.5 strong odor
21			97.2	21.0 - 22.0 wood		
			125.5			
22			176.4	22.0 - 23.5 moist, m. dense, grey brown, SILT, and fragmented rock (incompetent), odor + sheen	silt + rock	
			167.1			
23			174.1			
			167.9	23.5 - 25.0 moist, m. dense, grey brown SILT and fragmented rock (competent)	SAA, no sheen	
24			173.7			
			180.1			
25		0.0/5.0	-	25.0 - 27.0 bedrock / no recovery (drilled to 27.0)		
			-			
26			-			
			-			
27			-	EOB @ 27.0'		
			-			
28			-	collected SM		
			-			
29			-			
			-			
30	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFM	BORING/WELL NO.: SPDI-4
PROJECT NAME: W 48th SPDI	DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: AOT	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		2.0/5.0	0.0	0.0 - 0.8 Asphalt		HC start 0920 9/28/22
			0.0	0.8 - 2.0 moist, dense, gray brown, f+c SAND, brick fragments		
_1			0.0			9/29/22
			0.0			Refusal @ 2.0'
_2			-	Refusal @ 2.0', brick and concrete		
			-	wall / footing		
_3			-			
			-			
_4			-			
			-			
_5		ADV 5.0		N/A -		
_6						
_7						
_8						
_9						

10 Notes

Sample Types	Field Identification Notes	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFM	BORING/WELL NO.: SPDI-S
PROJECT NAME: WYSIN SPDI	DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: AOT	LOCATION PLAN
GROUNDWATER OBSERVATIONS	RIG TYPE:	
WATER LEVEL:	DATE/TIME START: 10/14/22 @ 1200	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		start HC
			0.0	0.8 - 5.0 moist, m. dense, brown, fine SAND, brick fragments, trace subangular gravel		on 9/29/22
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0			
			0.0			
_5		2.9/5.0	10.1	5.0 - 7.0 wet, loose, rock and slag fragments		Start drilling 10/14/22 @ 1200
			2.4			
_6			1.3			
			1.0			
_7			-	7.0 - 10.0 no recovery		
			-			
_8			-			
			-			
_9			-			
			-			
_10	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages:
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
	Page 1 of ___	trace - <10%

PARSONS

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Soil Boring Log

CLIENT:
PROJECT NAME:
PROJECT LOCATION:
PROJECT NUMBER:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR:
RIG TYPE:
DATE/TIME START:
DATE/TIME FINISH:
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SB05-5
LOCATION DESCRIPTION:
LOCATION PLAN

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		3.0/5.0	8.5	10.0 - 11.0 wet, loose, black, fine SAND and gravel, v light color		
			16.0			
11			24.7	11.0 - 11.5 concrete		
			16.3	11.5 - 13.0 wet, m. dense, stiff, fine SAND and gravel, trace silt, strong odor, staining		mbp
12			389.9			
			168.0			
13			-	13.0 - 15.0 No recovery		
			-			
14			-			
			-			
15		/5.0	981	~~15.0 - 16.0~~ 15.0 - 16.0 SAA		
			104.2			
16			-	16.0 - 20.0 no recovery		GP
			-			
17			-			
			-			
18			-			
			-			
19			-			
			-			
20	Notes:					

Sample Types
S – Split Spoon
A – Auger Cuttings
U – Undisturbed Tube
C – Rock Core

Field Identification Notes
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed
PROJECT NAME: W 45th St
PROJECT LOCATION: NY
PROJECT NUMBER:
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

INSPECTOR: AFA
DRILLER: RJ
WEATHER:
CONTRACTOR: ADT
RIG TYPE: Scout
DATE/TIME START: 10/12/22 @
DATE/TIME FINISH:
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SPOS-6
LOCATION DESCRIPTION:
LOCATION PLAN
CL Soil
Fine grained, med. plasticity
10.0 - 15.0

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		
			0.0	0.8 - 5.0 moist, m. dense, gray brown, fine SAND		
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0			
			0.0			
_5		3.0/5.0	49.7	5.0 - 8.0 moist, m. dense, gray brown, fine SAND and CLAY	CL	start drilling 10/12/22 @ 1130
			91.7			
_6			42.9			
			61.2			
_7			10.1			
			6.9			
_8			-	8.0 - 10.0 no recovery		
			-			
_9			-			
			-			

_0 Notes:

Sample Types
S -- Split Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Field Identification Notes
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages:
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SPDI-6
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	LOCATION PLAN
GROUNDWATER OBSERVATIONS		RIG TYPE:	
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0/5.0	0.1	10.0 - 11.0 concrete		
			0.3			
1			0.5	11.0 - 14.5 moist, m. dense, red brown, CLAY, some silt		
			0.3			
2			0.4			
			0.4			
3			0.5			
			0.5			
4			0.5			
			0.5	14.5 - 15.0 concrete		
5		/5.0		15.0 EOB, drill 2nd clearance for volume		
				collected CL		
6						
7						
8						
9						
10	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
	Page 2 of	trace - <10%

PARSONS

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Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFR	BORING/WELL NO.: SPOI-7
PROJECT NAME: W45th St	DRILLER: R3	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: AOT	LOCATION PLAN
GROUNDWATER OBSERVATIONS	RIG TYPE: Soil C	
WATER LEVEL: 3.0	DATE/TIME START: 10/13/22 @ 0800	
DATE:	DATE/TIME FINISH: 10/13/22 @ 1030	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		
			0.0	0.8 - 3.0 moist, m. dense, brown, fine SAND		
_1			8.0			
			0.9 0.0			
_2			2.8 0.0			
			16.2 0.0			
_3			29.3 0.0	3.0 - 5.0 wet, SAA, free LNAPL		strong NAPL odor
			41.2 0.0	product		
_4			47.1 0.0	boulder @ 4.0		
			52.1 0.0			
_5		0.0/5.0	-	5.0 - 10.0 no recovery		Start drilling 10/13/22 @ 0800
			-			
_6			-			
			-			
_7			-			
			-			
_8			-			
			-			
_9			-			
			-			

PID Notes:

Sample Types	Field Identification Notes	Gradation Percentages
S – Split Spoon A – Auger Cuttings U – Undisturbed Tube C – Rock Core	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50% some - 20-35% little - 10-20% trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SPOT-7
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	LOCATION PLAN
GROUNDWATER OBSERVATIONS		RIG TYPE:	
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
L0		5.0/5.0	259.9	10.0 - 14.5 wet, m. dense, dark gray, f-m SAND and subrounded/l. gravel		med. odor 10.0 - 15.0
			339.1			
L1			21.6			
			~~66~~ 16.5			
L2			3.4			
			4.1			
L3			6.0			
			5.1			
L4			0.8			
			4.2	14.5 - 15.0 concrete		
L5		4.0/5.0	5.4	15.0 - 17.5 wet, m. dense, dark gray, f-m SAND, trace silt		
			1.5			
L6			0.9			
			3.3			
L7			4.9			
			17.9	17.5 - 19.0 wet, m. dense, brown gray, f-m SAND, little silt		
L8			14.7			
			10.1	* base @ 18.5		
L9			~~7.0~~	19.0 - 20.0 no recovery		
			5.7			
L10	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPOT-7
PROJECT NAME:	DRILLER:	
PROJECT LOCATION:	WEATHER:	LOCATION DESCRIPTION:
PROJECT NUMBER:	CONTRACTOR:	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
20		5.0/5.0	1.9	20.0-23.0 SAA, brown fragments @ 20.0-20.5		
			0.5			
21			7.7			
			0.5			
22			2.2			
			54.3			
23			4.4	23.0-24.0 concrete		
			4.0			
24			3.4	24.0-25.0 moist, dark, gray, fine SAND, some silt, little subangular gravel		
			2.1			
25		-/5.0		25.0 EOB		
26						
27						
28						
29						
30	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed
PROJECT NAME: W 45th SPOI
PROJECT LOCATION: NY
PROJECT NUMBER:

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

INSPECTOR: AFM
DRILLER:
WEATHER:
CONTRACTOR: AOT
RIG TYPE:
DATE/TIME START:
DATE/TIME FINISH:
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SPOI - 8
LOCATION DESCRIPTION:
LOCATION PLAN

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 1.0' Asphalt		Start HC 9/22/22 @ 1300
			0.0			
_1			0.0	1.0 - 5.0 moist, m. dense, brown, f/c SAND, trace subangular gravel		
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0			HC to 5.0' @ 0925 on 9/23/22
			0.0	* schist boulder @ 4.5'		
_5		0.0/5.0		5.0 - 6.0 drilled but no recovery - refusal @ 6.0', no advance for 1 hr drilling		
_6						
_7						
_8						
_9						
10	Notes:					

Sample Types
S – Split Spoon
A – Auger Cuttings
U – Undisturbed Tube
C – Rock Core

Field Identification Notes:
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages:
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFA	BORING/WELL NO.: SPDI-9
PROJECT NAME: 145th SPDI	DRILLER: RJ	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: ADT	LOCATION PLAN
GROUNDWATER OBSERVATIONS	RIG TYPE:	
WATER LEVEL:	DATE/TIME START: 10/4/22 @ 0830	
DATE:	DATE/TIME FINISH: 10/4/22 @ 0930	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.5 concrete (sidewalk)		Start HC 9/21/22 @ 1035
			0.0	0.5 - 5.0 moist, m. dense, brown, f-c SAND, trace subangular gravel		
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0			HC to 5.0' on 9/21/22 1305
			0.0			
_5		5.0/5.0	0.0	5.0 - 7.0 wet, m. dense, gray brown to light gray, f-m SAND, some silt		Rig start 10/4/22 @ 0830
			0.0			
_6			0.0			
			0.0			
_7			0.0	7.0 - 9.0 SAA, trace clay		
			0.0			
_8			0.0			
			0.0			
_9			0.0	9.0 - 10.0 rock		
			0.0			
10						

Notes:

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SPD1-9
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	LOCATION PLAN
GROUNDWATER OBSERVATIONS		RIG TYPE:	
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		1.5/5.0	0.0	10.0 - 11.5 core		
			0 0			
11			0.0			
				EOB @ 11.5		
12				↓		
				Bedrock		
13						
14						
15		/5.0		15.0 -		
16						
17						
18						
19						
20	Notes:					

Sample Types		Field Identification Notes:	Gradation Percentages
S – Split Spoon	A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube			some - 20-35%
C – Rock Core			little - 10-20%
			trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed	INSPECTOR: AFM	BORING/WELL NO.: SPDI - 10
PROJECT NAME: W45th SPDI	DRILLER: RJ	LOCATION DESCRIPTION:
PROJECT LOCATION: NY	WEATHER:	
PROJECT NUMBER:	CONTRACTOR: ADT	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START: 10/3/22 0920	
DATE:	DATE/TIME FINISH: 10/3/22 1320	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.8 Asphalt		
			0.0	0.8 - 1.5 dry, dense, brown, f/c SAND, some subangular gravel (compacted)		
_1			0.0			
			0.0	1.5 - 5.0 SAA, brick fragments, moist		
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0			
			0.0			
_5		3.0/5.0	0.0	5.0 - 8.0 moist, m. dense, dark grey brown, f/c SAND, trace subangular gravel, trace mica schist rock @ 7.5'		start drill 10/3 @ 0920
			0.0			
_6			0.0			
			0.0			
_7			0.0			
			0.0			
_8			-	8.0 - 10.0 no recovery		
			-			
_9			-			
			-			

10 Notes

Sample Types	Field Identification Notes	Gradation Percentages:
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPPI-10	
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
L0		5.0/5.0	0.0	10.0-12.0 moist, m. dense, dark gray,		
			0.0	fine SAND, some silt,		
L1			0.0	little mica shist rock		
			0.0			
L2			0.0	12.0-14.5 ~~moist~~		
			0.0	moist, dense, dark gray		
L3			0.0	brown, fine SAND, little		
			0.0	silt, little concrete		
L4			0.0	14.5-15.0 concrete		
			0.0			
L5		4.0/5.0	0.0	15.0-16.5 wet, m. dense, gray,		
			0.0	fine SAND, little silt,		
L6			0.0	trace subangular		
			0.0	gravel		
L7			0.0	16.5-17.5 SAA, moist		
			0.0	17.5-19.0 ~~coal~~ micaceous shist		
L8			0.0			
			0.0			
L9			-	19.0-20.0 no recovery		
			-			

20 Notes:

Sample Types	Field Identification Notes:	Gradation Percentages:
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SPDI-10
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	
GROUNDWATER OBSERVATIONS		RIG TYPE:	LOCATION PLAN
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
20		5.0/5.0	0.0	20.0 - 21.0 wet, m. dense, dark brown, fine SAND, some silt, trace subrounded gravel		
			0.0			
21			0.0			
			0.0	21.0 - 25.0 wet, m. dense, dark gray brown, fine SAND, trace clay. *Broken pieces of schist from shovel sample		
22			0.0			
			0.0			
23			0.0			
			0.0	*21.5 - 22.5 solid rock		
24			0.0			
			0.0			
25		1.0/5.0	0.0	25.0 - 26.0 solid rock		
			0.0			
26				EOB @ 26.0'		
				↓		
27				Bedrock		
28						
29						
30						

Notes:

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT: Con Ed
PROJECT NAME: WMSTN SBDT
PROJECT LOCATION: NY
PROJECT NUMBER:

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEASURED FROM:

INSPECTOR: AFM
DRILLER:
WEATHER:
CONTRACTOR: ADT
RIG TYPE:
DATE/TIME START: 10/4/22 1025
DATE/TIME FINISH:
WEIGHT OF HAMMER: Not Applicable
DROP OF HAMMER: Not Applicable
TYPE OF HAMMER: Not Applicable

BORING/WELL NO.: SBD1-11B
LOCATION DESCRIPTION:
LOCATION PLAN

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0-0.8 Asphalt		Start HC 9/20/22 @ 1335
			0.0	0.8-5.0 dry, dense, brown, fine SAND, little subangular gravel (compacted), trace brick fragments		
_1			0.0			
			0.0			
_2			0.0			
			0.0			
_3			0.0			
			0.0			
_4			0.0	mica schist boulder @ 4.5'		Refusal 5.0' HC @ 0930
			0.0			
_5		1.0/5.0	0.0	5.0-6.0 SAA, wet		Start drill 10/4/22 1025
			0.0			
_6			—	6.0-10.0 no recovery		
			—			
_7			—			
			—			
_8			—			
			—			
_9			—			
			—			

10 Notes:

Sample Types
S – Split Spoon
A – Auger Cuttings
U – Undisturbed Tube
C – Rock Core

Field Identification Notes
moisture, density, color, Gradation, observations (USCS symbol) (Strata)

Gradation Percentages
and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SPD1-11
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	LOCATION PLAN
GROUNDWATER OBSERVATIONS		RIG TYPE:	
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
L0		2.0/5.0	0.1	10.0 - 12.0 wet, m. dark, gray, fine SAND, trace silt		
			0.1			
L1			0.1	11.0 - 17.0 mica schist rock		
			0.1			
L2			-	12.0 - 15.0 no recovery		
			-			
L3			-			
			-			
L4			-			
			-			
L5		0.0/5.0	-	15.0 - 20.0 no recovery		
			-			
L6			-			
			-			
L7			-			
			-			
L8			-			
			-			
L9			-			
			-			
L0	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	SPOT - 11
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
20		2.5/5.0	0.1	20.0 - 22.5 wet, loose, grey to dark grey, slag and rock		
			0.2			
21			0.2			
			0.2			
22			0.2			
			-	22.5 - 25.0 no recovery		
23			-			
			-			
24			-			
			-			
25		2.0/5.0	0.2	25.0 - 27.0 wet, loose, ~~dark~~ silt and slag, trace fine SAND		
			0.2			
26			0.2			
			0.2			
27			-	27.0 - 30.0 no recovery		
			-			
28			-			
			-			
29			-			
			-			
30	Notes:					

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPDI-11
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:	WEATHER:	
PROJECT NUMBER:	CONTRACTOR:	
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	
DATE:	DATE/TIME FINISH:	
TIME:	WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:	DROP OF HAMMER: Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
30		2.0/5.0	7.2	30.0-30.5 wet, loose, gray brown, f-m SAND and brick fragments		
			7.9			
31			11.0	30.5-32.0 wet, m. dense, gray brown, f-m SAND, little silt, trace subangular gravel		
			11.1			
32			-	32.0-35.0 no recovery		
			-			
33			-			
			-			
34			-			
			-			
35		5.0/5.0	576.1	35.0-38.0 wet, loose, gray brown, f-m SAND, little silt, trace subangular gravel		wet/ strong odor 35.0-40.0
			570.8			
36			568.2			
			506.1			
37			448.0			
			405.3			
38			312.1	38.0-39 wet, m. dense, gray, CLAY, trace fine sand		
			289.0			
39			273.1	39.0-40.0 Bedrock		
			181.8			
40	Notes:			EOB @ 40.0'		

Sample Types	Field Identification Notes:	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	SPOI - 12
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START: 1200		
DATE:	DATE/TIME FINISH: 1430 10-5-22		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
_0		5.0/5.0	0.0	0.0 - 0.5 ~~Asphalt~~ Concrete		HC start 9/27/22 e
			0.0	0.5 - 1.0 Asphalt		
_1			0.0	1.0 - 5.0 moist, m. dense, brown, f-c SAND, trace		
			0.0			
_2			0.0	mica schist rock		
			0.0			
_3			0.0			
			0.0			
_4			0.0			HC complete 0825 9/28/22
			0.0			
_5		3.0/5.0	-	5.0 - 7: NR		
			-			
_6			-	~~7-10'~~ (EI)		
			-	7-8.5: 100%, wet black-brn m Sand		
_7			0.0	8.5-9: Concrete		
			0.0			
_8			0.4	9-10: 100%, wet black-brn m Sand		
			0.3			
_9			0.0			
			0.0			

L0 Notes

Sample Types	Field Identification Notes	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.: SPDJ-12	
PROJECT NAME:	DRILLER:	LOCATION DESCRIPTION:	
PROJECT LOCATION:	WEATHER:		
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH:		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		0.0/5.0		10.0-15 no recovery		
11						
12						
13						
14						
15		5.0/5.0	0.6	15.0-20: mild odor, black coarse Sand, lots Large angular gravel		
			0.6			
16			0.8			
			1.4			
17			2.1			
			0.7			
18			0.5			
			1.6			
19			3.7			
			3.6			
20	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:		INSPECTOR:	BORING/WELL NO.: SP01-12
PROJECT NAME:		DRILLER:	LOCATION DESCRIPTION:
PROJECT LOCATION:		WEATHER:	
PROJECT NUMBER:		CONTRACTOR:	LOCATION PLAN
GROUNDWATER OBSERVATIONS		RIG TYPE:	
WATER LEVEL:		DATE/TIME START:	
DATE:		DATE/TIME FINISH:	
TIME:		WEIGHT OF HAMMER: Not Applicable	
MEASURED FROM:		DROP OF HAMMER: Not Applicable	
		TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
2_0		5.0/5.0	0.0	20-25': Mild odor, black coarse Sand, lots large angular gravel, some brick, slight sheen		
			0.0			
2_1			0.0			
			0.4			
2_2			1.3			
			1.1			
2_3			0.7			
			0.7	25-30': Scrap metal, Strong odor		
2_4			1.0			
			0.7			
2_5		5.0/5.0	0.6	30-35': Dense, brn clay, Some ceramic? Strong odor		
			9.9			
2_6			9.1			
			8.4			
2_7			9.8			
			17.6			
2_8			27.8			
			30.4			
2_9			46.8			
			47.1			
3_0	Notes:		50.0			

Sample Types	Field Identification Notes:	Gradation Percentages:
S – Split Spoon A – Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U – Undisturbed Tube		some - 20-35%
C – Rock Core		little - 10-20%
		trace - <10%

PARSONS

CamScanner

Soil Boring Log

CLIENT:	INSPECTOR:	BORING/WELL NO.:	
PROJECT NAME:	DRILLER:		
PROJECT LOCATION:	WEATHER:	LOCATION DESCRIPTION:	
PROJECT NUMBER:	CONTRACTOR:		
GROUNDWATER OBSERVATIONS	RIG TYPE:	LOCATION PLAN	
WATER LEVEL:	DATE/TIME START:		
DATE:	DATE/TIME FINISH: 1430		
TIME:	WEIGHT OF HAMMER: Not Applicable		
MEASURED FROM:	DROP OF HAMMER: Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
30			641.9	30-35': Micah Pragments very stray odor		
			655.1			
31			783	36': Bedrock. EOB		
			774			
32			650			
			776			
33			795			
			804			
34			815			
			981			
35			1235			
36						
37						
38						
39						
40	Notes:					

Sample Types	Field Identification Notes	Gradation Percentages
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35-50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core	Page 4 of 4	little - 10-20%
		trace - <10%

CamScanner

Contractor: Aquifer Drilling & Testing Inc.
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: Truck CME 75 - Drive and Wash

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 1 of 1 **PDI-1/MW-22**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW	DTW 1.52		
Date		4/10/12		
Time		1150		
Meas. From	Split Spoon	Top of Casing		

Weather: Cloudy, drizzle, 45F
Date/Time Start: 3/6/12 ; 1000
Date/Time Finish: 3/22/12 ; 1100

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
							Locking J-plug
0	Vac-Tron	Hand-Cleared	---		0-6" CONCRETE 6-60" Brown, fine to coarse SAND and GRAVEL, very dense; Black GNEISSIC SCHIST COBBLES very abundant below 30"; BRICK and MORTAR debris abundant below 30"		Flush Mount Well Cover and Concrete Apron
2							2-inch ID PVC Riser (0.5'-5')
4							
	5-6' Roller bit	-			Use of roller bit from 5-6' due to obstruction		
6	6-8' (SS) 2" Spoon	10-50/3"	6"	0.8	0-6" Hard, slightly weathered, black, micaceous, GNEISSIC SCHIST, some Sand, some fine Gravel		Well Screen 2"-ID (5'-15')
8	8-10' (SS) 2" Spoon	40-14-86/5	9"	1.2	0-9" Hard, fresh to slightly weathered, black, micaceous, GNEISSIC SCHIST; rock flour in drive shoe		
10	10-11' Roller	-			Use of roller bit from 10-11' to try to get passed rock		# 1 Sand (0' - 15')
12	11-13' (SS) 2" Spoon	6-6-6-4	6"	1.7	0-6" Soft, highly weathered, black, GNEISSIC SCHIST, sheen present in sample; Schist in wash water to 13'		
14	13-15' (SS) 2" Spoon	5-4-4-4	6"	2.0	0-6" Soft, highly weathered, black, GNEISSIC SCHIST		
16	15-17' (SS) 2" Spoon	4-5-4-5	4"	2.7	0-4" Soft, highly weathered, black, GNEISSIC SCHIST, slight odor		PVC End Cap (15')
18	17-19' (SS) 2" Spoon	22-44-48-11	12"	1.5	0-12" Soft, highly weathered, black, GNEISSIC SCHIST		Boring was grouted from 37.5 to 15 ft bgs prior to well install
20	19-21' (SS) 2" Spoon	26-50/2"	8"	3.4	0-8" Soft, highly weathered, black, GNEISSIC SCHIST; weathered red staining at 2"		
22	21-23' (SS) 3" Spoon	15-11-7-5	9"	1.3	0-9" Soft, highly weathered, black, micaceous, GNEISSIC SCHIST, slight hydrocarbon odor		
24	23-25' (SS) 3" Spoon	13-8-11-11	11"	4.2	0-11" Soft to moderately hard, fresh to slightly weathered, black, micaceous, GNEISSIC SCHIST, little fresh, hard, white to rose, Quartz, Slight hydrocarbon		
26	25-27' (SS) 3" Spoon	9-19-45-50/4"	8"	37.8	0-8" Soft to moderately hard, fresh to slightly weathered, black, micaceous, GNEISSIC SCHIST, little fresh, hard, white to rose, Quartz, Slight hydrocarbon		
28	25.5-30.5' (C) Coring	-	Recovery: 7" RQD: 12%		Cored from 25.5 to 30.5': Hard, fresh, black, fine grained, GNEISS 25.5-26.5' -> 10 minutes 26.5-27.5' -> 1 minute 27.5-28.5' -> 5 minutes 28.5-29.5' -> 5 minutes 29.5-30.5' -> 1 minute		
30							
32	30.5-35.5' (C) Coring	-	Recovery: 29" RQD: 33%	3.1	Cored from 30.5 to 35.5': Hard,fresh, black to gray, micaceous, GNEISSIC SCHIST, fractures at 8", 12", 18" and 24"; From 8 to 12" is a gray, hard, fine grained material resembling grout, possibly from MW-1 (PID of grout material=66.3 ppm) 30.5-31.5' -> 15 minutes 31.5-32.5' -> 2 minutes 32.5-33.5' -> 6 minutes 33.5-34.5' -> 7 minutes		
34							
36	35.5-37.5' (C) Coring	-	Recovery: 16.5" RQD:N		Cored from 35.5 to 37.5': 0-0.75" STEEL, 0.75-15" CONCRETE; 15-16.5" Hard, fresh, black gneissic SCHIST; Recovery=16.5"; RQD=N/A 35.5-36.5' -> 22 minutes 36.5-37.5' -> 4 minutes		
					End of Boring at 37.5 ft bgs		

SAMPLING METHOD

SO = SONIC RIG	0 to 5'=Hand-Clearance (3/14)
SS = SPLIT SPOON (2", 3")	5 to 6', 10 to 11'=Roller Bit; 6 to 10', 11 to 27'=Interval sampling with split spoon
A = AUGER CUTTINGS	25.5 to 30.5', 30.5 to 35.5', and 35.5 to 37.5'=Rock Cored
C = CORED	Boring complete to 37.5' bgs; Grouted to 15 ft bgs. Installed MW-22 to 15 ft bgs (2" well)

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-2 — Sheet 1 of 2

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Jenkins/Chris Mi
Inspector: Sam Monte
Rig Type: Sonic / CME 75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Cloudy, upper 60s
Date/Time Start: 5-7-12, 13:30
Date/Time Finish: 5-10-12, 10:30

GROUNDWATER OBSERVATIONS

Water Level	DTW ~5'	DTW		
Date	3/15/2012			
Time	930			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT		Observed Water Level at 4' bgs
				5.6	8"-3' Moist, brown fine to coarse SAND, some Cobble, little Concrete debris		
2				12.2	3-5' Moist, brown fine to coarse SAND, some Cobble, little Concrete debris, trace Wood		
				12.2	5-6' Wet, brown fine to coarse SAND, some Cobble, little Concrete debris, trace Wood. sheen		
4							
	5-10' (SO) Sonic	---	48"	2212.0	0-12" Coarse GRAVEL		
6				9999+	12-36" Grey SAND, some Silt, trace Gravel, NAPL Blebs		
				9999+	36-48" Wet, grey SAND, some Silt, trace Gravel, NAPL Blebs, strong hydrocarbon odor		
8							
10	10-15' (SO) Sonic	---	60"	9999+	0-36" Wet, grey SAND, some Silt, trace Gravel, NAPL Blebs-Saturation, strong hydrocarbon odor		
12				1700.0	36-60" Brown SAND, some Silt, trace Cobble, trace Brick, NAPL Blebs, hydrocarbon odor		
14							
	15-20' (SO) Sonic	---	24"	9999+	0-12" Red/brown SAND and SILT, trace Cobble, trace Gravel, NAPL Blebs, hydrocarbon odor		Large Cobble in drilling shoe
16							
				9999+	12-24" Grey/olive SAND, some Silt, trace Gravel, NAPL Blebs, hydrocarbon odor		
18							
20	20-25' (SO) Sonic	---	60"	4445.0	0-30" Wet, dark grey SAND, some Silt, NAPL Blebs, hydrocarbon odor		
				5875.0	30-60" Dry, red BRICK		
22							
24							
	25-30' (SO) Sonic	---	48"	1675.0	Dry, red BRICK		
26							
28							
30	30-35' (SO) Sonic	---	60"	507.0	Dry, red BRICK		
32							
34							
	35-40' (SO) Sonic	---	60"	507.0	0-48" Dry, red BRICK		
36				294.0	48-60" CONCRETE		
38							
40	40-45' (SO) Sonic	---	30"	---	0-6" CONCRETE		
					6-12" Black, weathered GNEISSIC SCHIST		
42					12-30" White SCHIST (quartz veins)		
44							

Please see Sheet 2

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/15)
5 to 45'=Interval sampling with and sonic rig (5/8)
45 to 50'=Rock Cored (1 segment, 5/11)
Boring complete to 50' bgs; Grouted to surface

Contractor: Advanced Drilling Technology **Driller:** Chris Mason, Chris Jenkins/Chris Migl **Inspector:** Sam Monte **Rig Type:** Sonic / CME 75	**PARSONS** **DRILLING RECORD** **PROJECT NAME:** Consolidated Edison West 45th Street PDI **PROJECT NUMBER:** 446672-05000	**BORING/ WELL NO.** PDI-2 Sheet 2 of 2 **Location Description:** West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	3/15/2012			
Time	930			
Meas. From	Hand Clearance	Top of Casing		

Weather: Cloudy, upper 60s

Date/Time Start: 5-7-12, 13:30

Date/Time Finish: 5-10-12, 10:30

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
45	45-50' (C) Coring	---	Recovery: 42" RQD: 72%		White SCHIST, some black GNEISSIC SCHIST incursions; vertical rose quartz vein dips		
					45-46' - 28 minutes		
					46-47' - 31 minutes		
47					47-48' - 34 minutes		
					48-49' - 45 minutes		
49					49-50' - 60 minutes		
					End of Boring at 50 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/15)
5 to 45'=Interval sampling with and sonic rig (5/8)
45 to 50'=Rock Cored (1 segment, 5/11)
Boring complete to 50' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-3 — Sheet 1 of 1

Contractor: Aquifer Drilling & Testing Inc.
Driller: Chris Migliori/Frank Quinn
Inspector: N. Garguilo/D. Miller/S. Monte
Rig Type: Truck CME 75 (Drive and Wash)

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	3/21/2012			
Time	1045			
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, 40s to 50s
Date/Time Start: 3/30/12 ; 1100
Date/Time Finish: 4/3/12 ; 1025

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT		Hand clearance was conducted to 6 ft bgs Observed Water Level at 5' bgs
				0.0	8-42" Brown medium to fine SAND, some Silt, little medium to fine Gravel		
2				77.3	42-48" Brown medium to fine SAND, some Silt, some medium to coarse Gravel, strong hydrocarbon odor		
4				66.3	48-72" Brown medium to fine SAND, some Silt, some medium to coarse Gravel, strong hydrocarbon odor		
6	5-7' (SS) 3" Spoon	1-1-1-1	6"	112	0-6" Wet, brown, fine to coarse SAND, some subangular to round Gravel, little Silt, light to moderate NAPL staining, moderate hydrocarbon odor		
8	7-9' (SS) 3" Spoon	5-5-5-5	20"	1122	0-20" Wet, brown, SAND and subangular GRAVEL, little Silt, wood, and brick fragments, trace porcelain fragment, NAPL blebs, discrete NAPL saturated areas, strong hydrocarbon odor		
10	9-11' (SS) 3" Spoon	3-4-4-3	20"	730	0-20" Wet, dark brown, fine to coarse SAND and fine to coarse GRAVEL, trace Silt, NAPL staining from 0-2", NAPL and tar blebs (0.25" diameter) from 18-20", moderate hydrocarbon odor		
12	11-13' (SS) 3" Spoon	4-5-5-3	13"	213	0-8" Wet, dark brown, fine to medium SAND, little Gravel, trace Silt, slight hydrocarbon odor 8-13" Wet, olive, fine to medium SAND, little Gravel, trace Silt, slight fuel oil-like odor		
14	13-15' (SS) 2" Spoon	Weight of Rod/24"	0"	-	No Recovery		
16	15-17' (SS) 2" Spoon	9-3-3-12	6"	72.8	0-6" Wet, gray medium to coarse SAND, some black fine to medium Sand, some micaceous Schist, trace medium to coarse Gravel		
18	17-22' (C) Coring	-	Recovery: 50" RQD: 73%		Cored from 17 to 22': Black/Dark gray, GNEISSIC SCHIST, slight odor in rock (Attempt 1) 17-18'->75 minutes, 6" of core; (Attempt 2) 17-18' -> 60 minutes 18-19' -> 90 minutes 19-20' -> 90 minutes 20-21' -> 90 minutes 21-22' -> 15 minutes		
22	22-27' (C) Coring	-	Recovery: 58" RQD: 88%		Cored from 22 to 27': Black/ Dark gray, GNEISSIC SCHIST 22-23' -> 12 minutes 23-24' -> 15 minutes 24-25' -> 16 minutes 25-26' -> 18 minutes 26-27' -> 14 minutes		
					End of Boring at 27 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON: (2", 3")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/21); 5 to 17'=Interval sampling with (3" and 2") split spoon
Casing refusal at 17', use roller bit to clear borehole
17 to 22', 22 to 27'=Rock Cored
Boring complete to 27' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Migliori
Inspector: Sam Monte/Zohar Lavy
Rig Type: CME 75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-4 Sheet 1 of 1
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW 3.5 ft	DTW		
Date	3/21/2012			
Time	1330			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, 40's
Date/Time Start: 4/3/12 ; 1315
Date/Time Finish: 4/5/12 ; 1030

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT 8-60" Brown, fine to medium SAND, some Silt, some medium to coarse Gravel, little Brick fragments		Observed Water Levelat 3.5 ft bgs
2							
4							
	5-7' (SS) 3" Spoon	-	0"		No Recovery		
6							
	7-9' (SS) 3" Spoon	3-11-24-13	6"	1.1	0-6" Brown SILT and weathered, micaceous, black GNEISSIC SCHIST		
8							
	9-11' (SS) 3" Spoon	4-1-1-2	6"	2.5	0-6" Brown SILT and weathered, micaceous, black GNEISSIC SCHIST		
10							
	11-13' (SS) 3" Spoon	6-3-3-1	6"	19.6	0-6" Wet, black, weathered GNEISSIC SCHIST, slight fuel oil-like odor		
12							
	13-15' (SS) 3" Spoon	4-3-2-6	10"	81.2	0-10" Black, weathered GNEISSIC SCHIST, trace brown Silt, fuel oil-like odor		
14							
	15-17' (SS) 3"	50/1"	0"	NA	No Recovery		
16	15-20' (C) Coring	-	Recovery: nine 2-3" pieces RQD: 0%		Cored from 15 to 20': Hard, black, Gneissic SCHIST, weathering and soil at existing fractures/interfaces: one 3" long Concrete piece; two 2-3" long hard, fresh, fine grained black Gneiss. Boulders and cobbles. 15-16' -> 8 minutes 16-17' -> 7 minutes 17-18' -> 6 minutes 18-19' -> 5 minutes 19-20' -> 12 minutes		
18							
20	20-25' Roller Bit	-	-	-	Drove casing to 20 feet. Roller bit and drive casing 20-25' due to obstructions.		
22							
24							
	25-27' (SS) 2" Spoon	3-2-1-2	3"	0.0	0-3" Black, GNEISSIC SCHIST; Brick in cutting shoe		
26							
	27-29' (SS) 2" Spoon	13-1-2-4	6"	77.9	0-6" Wet, brown, fine SAND and GRAVEL, some Brick, NAPL blebs		
28							
	29-31' (SS) 2" Spoon	9-15-7-9	6"	112	0-4" Wet, black, fine to coarse SAND, trace fine angular Gravel, trace Brick fragments, strong hydrocarbon odor, sheen; 4-6" Brick, strong hydrocarbon odor		
30							
	31-33' (SS) 2" Spoon	6-8-7-8	8"	260	0-8" Wet, brown/black, fine to coarse SAND, some Brick, NAPL blebs, strong hydrocarbon odor		
32							
	33-35' (SS) 2" Spoon	4-1/18"	10"	114	0-10" Wet, brown, medium to coarse SAND, trace fine subangular Gravel, trace weathered Schist, trace Brick		
34							
	35-35.2' (SS) 2" Spoon	50/2"	2"	307	0-2"Brown/dark gray, fine to medium SAND, trace fine angular Gravel, trace Gneissic Schist, strong hydrocarbon odor		
36	35.2 - 36" Roller Bit				Roller bit to 36 feet		
	36-36.5' (SS) 2" Spoon	50, 50/0"	6"	697	0-6" Wet, brown, SILT, strong hydrocarbon odor		
38	37.5-39.5' (C) Coring	-	Recovery: 6" RQD: N/A		Cored from 37.5 to 39.5': Metal. Three pieces recovered. First is a 1/2" thick plate, oriented horizontally. Other two pieces are roughly 5" long, and overlap at a near vertical junction. All pieces occupy entire diameter of core. 37.5-38.5' -> 17 minutes 38.5-39.5' -> 38.5 minutes		
					End of Boring at 39.5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON: (3", 2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/21)
5 to 16'=Interval sampling with split spoon (3") ; 25 to 36.5'=Interval sampling with split spoon (2")
15 to 20', 37.5 to 39.5' =Rock Cored
Boring complete to 39.5' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Zohar Lavy
Rig Type: Sonic Rig/CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-5 Sheet 1 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/23/2012			
Time	1155			
Meas. From	Split Spoon	Top of Casing		

Weather: Light rain, Up to 58F, Wind: 10-15 mph
Date/Time Start: 4/23/12 ; 1155
Date/Time Finish: 5/4/12 ; 1100

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0	0-8" ASPHALT		
				0	8"-1.5' Moist, brown SILT and GRAVEL, some Sand and Brick		
2				0	1.5-2' Moist, tan SAND and SILT		
				0	2-4' Moist, brown SILT and SAND		
4				0	4-5' COBBLE		Observed Water Level at 5 ft bgs
	5-10' (SO) Sonic	---	34	135	0-15" Wet, brown fine to medium GRAVEL, little fine to coarse Sand, trace Silt, trace Brick		
6					15-34" Moist, brown/gray fine to medium SAND, little Brick, little fine to coarse angular to subround Gravel, trace Silt		
8							
10	10-15' (SO) Sonic	---	40	240	0-20" Wet, dark brown/black fine to coarse GRAVEL, little Sand, trace Brick, hydrocarbon odor, staining, NAPL Blebs, sheens		
					20-40" Brown fine to medium SAND and BRICK (mortor joints present), NAPL saturation, hydrocarbon odor		
12							
14							
	15-20' (SO) Sonic	---	36	22.5	Moist, highly micaceous, weathered GNEISSIC SCHIST (likely from 17-20')		Sonic sampler advanced through a Gneissic Schist boulder
16							
18							
20	20-25' (SO) Sonic	---	18"	---	METAL, trace Brick (rivetted metal plates), tar/NAPL coating		
22							
24							
	25-30' (SO) Sonic	---	42"	85.0	0-8" Wet, brown/orange fine to coarse SAND and METAL, some Brick, little fine to coarse subangular gravel		
26					8-24" Wet, dark brown fine to coarse SAND and fine to coarse GRAVEL, little Brick, sheens, hydrocarbon odor		
28					24-42" Tan/olive fine to coarse SAND, little subangular to round fine to medium Gravel, trace Brick, trace Silt, trace Mica, sheens, hydrocarbon odor		
30	30-35' (SO) Sonic	---	24	690.0	0-12" Dark brown/black fine to medium SAND and METAL, trace schist, trace Gneiss, NAPL saturation, staining, odors, sheens,		
					12-24" Wet, dark brown fine to medium SAND,trace fine to medium subangular to round Gravel, trace Metal, NAPL saturation, hydrocarbon odor, staining, sheens		
32							
34							
	35-40' (SO) Sonic	---	40"	4324	0-20" Wet, METAL and fine dark brown/black SAND, trace Silt, NAPL saturation, strong hydrocarbon odor, staining		Resistance (hard drilling)
36					20-30" Brown fine to medium SAND, little weathered Gneiss, trace Silt, NAPL bleb		
					30-40" CONCRETE, trace Wood, trace Hair, trace Plastic/Resin		
38							
40	40-42.5' (SO) Sonic	---	30"	695	0-10" CONCRETE		
					10-30" Weathered GNEISS (soft)		
42							

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/14)
5 to 42.5' and 47.5 to 60' = Intervals sampled using sonic rig
42.5-47.5' and 60-65' =Rock Cored
Boring complete to 65' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic Rig/CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-5 Sheet 2 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/23/2012			
Time	1155			
Meas. From	Split Spoon	Top of Casing		

Weather: Light rain, Up to 58F, Wind: 10-15 mph
Date/Time Start: 4/23/12 ; 1155
Date/Time Finish: 5/4/12 ; 1100

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
42							
	42.5-47.5' (C) Coring	---	Recovery: 14" RQD: 0%		0-6" Weathered white SCHIST, trace Coal; 6-12" BRICK and MORTAR, Metal, Wood, Paper, Porcelain; 12-14" Black GNEISSIC SCHIST		
44					42.5-43.5' - 58 minutes		
					43.5-44.5' - 45 minutes		Sonic was used to drill passed metal and debris to 60 ft bgs
					44.5-45.5' - 70 minutes		
46					45.5-46.5' - 5 minutes		
					46.5-47.5' - 15 minutes		
48	47.5-55' (SO) Sonic	---	60"	---	Heavily fractured and weathered GNEISS and GNEISSIC SCHIST		
50							
52							
54							
	55-60' (SO) Sonic	---	60"	---	Heavily fractured and weathered GNEISS and GNEISSIC SCHIST		
56							
58							
60	60-65' (C) Coring	---	Recovery: 54" RQD: NA		Hard, black GNEISSIC SCHIST; mechanical breaks throughout at 20-40 degrees following folding planes and vein dips; 20-24" Fractured zone;		
					60-61' - 10 minutes		
62					61-62' - 10 minutes		
					62-63' - 9 minutes		
64					63-64' - 7 minutes		
					64-65' - 8 minutes		
					End of Boring at 65 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/14)
5 to 42.5' and 47.5 to 60' = Intervals sampled using sonic rig
42.5-47.5' and 60-65' =Rock Cored
Boring complete to 65' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-6 — Sheet 1 of 1

Contractor: Aquifer Drilling & Testing Inc.
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: Truck CME 75 (Drive and Wash)

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Cloudy, high 60s
Date/Time Start: 4/26/12 ; 0800
Date/Time Finish: 4/30/12; 1100

GROUNDWATER OBSERVATIONS

Water Level	DTW ~3' bgs	DTW		
Date	3/23/2012			
Time	1000			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	5.6	0-8" ASPHALT 8-36" Moist, brown fine to coarse SAND, some Concrete/Debris/Cobbles, slight hydrocarbon odor; 36-48" Wet, brown fine to coarse SAND, some Concrete/Debris/ Cobbles, slight hydrocarbon odor 48-60" Water; Dig bar advanced to 60" in several locations		Observed Water Level at 3 ft bgs
2							
4							
6	5-8' Roller bit				Drove casing to 8'; no 5 to 7 ft bgs sample taken due to rock obstructing case, apparent from difficulty driving case and difficulty advancing roller bit		
8	8-10' (SS) Spoon	50/2"	2"	0.0	0-2" Soft, highly weathered, black, GNEISSIC SCHIST		
10	10-12' (SS) Spoon	10-50/2"	0"	-	No Recovery		
12					Drove case to 12' bgs and advanced roller bit to 13' bgs		
14	13-18' (C) Coring	-	Recovery: 50" RQD: 80%		Cored from 13 to 18': 0-35" Hard, fresh, black, GNEISSIC SCHIST ; 35-50" Hard, fresh, white, SCHIST. Transition at 35" where rock type interface is intact 13-14' -> 10 minutes 14-15' -> 8 minutes 15-16' -> 14 minutes 16-17' -> 18 minutes 17-18' -> 15 minutes		
16							
18	18-23' (C) Coring	-	Recovery: 54" RQD: 85%		Cored from 18 to 23': 0-54" Hard, fresh, black, GNEISSIC SCHIST; First 1" of sample has some White, Schist incursions; existing fresh 20°-40° non-coplane fractures at 1", 6", 41" and 54"; green staining at 54" 18-19' -> 19 minutes 21-22' -> 10 minutes 19-20' -> 11 minutes 22-23' -> 15 minutes 20-21' -> 10 minutes		
20							
22							
					End of Boring at 23 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/23)
5 to 8', 12 to 13' = Roller bit; 8 to 12' = Interval sampling with split spoon (2")
13 to 18' and 18 to 23' = Rock Cored
Boring Complete at 23' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-7 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Sean Miller
Inspector: Sam Monte
Rig Type: CME-85

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW 2'	DTW		
Date	3/9/2012			
Time	1300			
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, high 60s
Date/Time Start: 4/4/12 ; 1150
Date/Time Finish: 4/5/12; 1010

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-9" ASPHALT		Observed Water Level at 2 ft bgs
2					9-24" Moist, brown fine to coarse SAND and GRAVEL, trace Silt, trace Cobbles; Brick and Mortar abundant at 12" bgs		
4					24" Ground water encountered Dig bar advanced to 60" in 3 locations		
6	5-7' (SS) Spoon	16-20-21-27	21"	53.1	0-21" Brown, fine to coarse SAND and coarse angular GRAVEL, Concrete in drive shoe, slight hydrocarbon odor		
8	7-9' (SS) Spoon	28-29-24-21	24"	121	0-24" Wet, brown, fine to coarse SAND and coarse angular GRAVEL		
10	9-11' (SS) Spoon	40-44-28-50/3"	18"	128	0-18" Moist, brown, fine to coarse SAND and coarse angular GRAVEL		
12	11 to 13' Auger		-	-	Auger to 13 ft bgs due to 50/3" blow count		
14	13-15' (SS) Spoon	14-8-6-3	16"	2083	0-4" Red BRICK 4-16" Moist, brown, micaceous SAND and SILT, some Gravel, hydrocarbon odor, NAPL blebs (0.25-0.5" diameter), low viscosity NAPL		
16	15-17' (SS) Spoon	5-10-4-4	20"	1356	0-20" Wet, brown, micaceous SAND and SILT, some Gravel, hydrocarbon odor, NAPL blebs (0.25-0.5" diameter), low viscosity NAPL		
18	17-19' (SS) Spoon	3-12-4-3	12"	1119	0-6" Light brown, SILT and SAND, some Gravel, strong hydrocarbon odor, Moderately to heavily abundant NAPL blebs, viscous NAPL 6-12" Wet, red BRICK, NAPL blebs		
20	19-21' (SS) Spoon	2-2-3-2	3"	141	0-3" Wet, brown/olive, medium SAND and GRAVEL. Lightly abundant NAPL blebs, low viscosity NAPL		
22	21-23' (SS) Spoon	WH-WH-4-8	24"	995	0-24" Wet, brown/gray fine SAND and SILT, some Gravel, NAPL present, slight hydrocarbon odor		
24	23-25' (SS) Spoon	2-2-2-4	0"	-	No Recovery		
26	25-27' (SS) Spoon,	5-2-5-4	12"	4495	0-8" Gray/brown, fine to medium SAND, some Silt, hydrocarbon odor, NAPL blebs 8-12" Dark brown, micaceous SILT, hydrocarbon odor, NAPL blebs		
28	27-29' (SS) Spoon	WOR-WOR-1-4	10"	792	0-10" Wet, gray/brown, SAND and SILT, some weathered Gneissic Schist, slight hydrocarbon odor, NAPL blebs (0.25" diam), low viscosity NAPL		
30	29-31' (SS) Spoon	WOR-WOR-1-1	10"	3700	0-10" Dark brown, fine to medium SAND and SILT, some coarse Gravel, hydrocarbon odor, NAPL blebs		
32	31-33' (SS) Spoon	2-1-2-1	12"	NA	0-12" Wet, soft, dark gray, SAND, some Silt, hydrocarbon odor		
34	33-35' (SS) Spoon	3-2-2-1	8"	1411	0-8" Brown, fine SAND, some Silt, little weathered Gneissic Schist, hydrocarbon odor, NAPL blebs		
36	35-37' (SS) Spoon	WH/24"	2"	85	0-2" Brown, fine SAND, some Silt, little weathered Gneissic Schist, hydrocarbon odor		
38	37-39' (SS) Spoon	2-3-4-6	6"	4186	0-6" Brown, fine SAND and weathered SCHIST, some BRICK,trace coal fragments, slight hydrocarbon odor		
40	39-41' (SS) Spoon	18-25-50/0"	10"	8072	0-10" Brown, fine SAND and black weathered GNEISSIC SCHIST, quartz in drive shoe, NAPL blebs, spotty sheen		
42	41-41.5' (SS) Spoon	50/4"	4"	9999	0-4" Brown, fine to medium SAND and weathered SCHIST, trace Cobble, hydrocarb		

End of Boring at 42 ft bgs

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (3")
WOR = Weight of Rod
WH = Weight of Hammer
C = CORED

0-5'=Hand Clearance (3/12)
5 to 11', 13 to 41.25' =Interval sampling with split spoon (3"); 11 to 13' and 40-41' = Auger; Auger refusal at 42' bgs
Quantification of NAPL performed by Noah Garguilo on 5/2/12 using bag samples
Boring complete to 42' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-8 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Only Hand Cleared
Inspector: Jeena Shepard
Rig Type: Vactron

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~2 ft bgs	DTW		
Date	3/12/2012			
Time	1330			
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, high 60s

Date/Time Start: 3/12/12; 1230

Date/Time Finish: 3/12/12; 0350

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT		
					8-24" Brown medium to coarse SAND, some Silt and fine to medium Gravel		
2					24" Ground water encountered		Observed Water Level at 2 ft bgs
					Dig bar advanced to 60" in several locations		
4							
					End of Boring at 5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/12)
This PDI location was not drilled because of field observations at PDI-7.

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-9 — Sheet 1 of 1

Contractor: Aquifer Drilling & Testing Inc.
Driller: S. Miller, C. Stratton, C. Migliori
Inspector: Sam Monte/Zohar Lavy/Noah Garguilo
Rig Type: CME 85 HSA, Sonic, CME 75 (Core)

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: High 50s, breezy
Date/Time Start: 4/5/12 ; 1305
Date/Time Finish: 4/13/12 ; 1256

GROUNDWATER OBSERVATIONS

Water Level	DTW ~3.5 ft bgs	DTW		
Date	3/19/2012			
Time	1000			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-10" CONCRETE		
				0.0	10-24" Moist, brown fine to coarse SAND, some Silt, some medium to coarse Gravel		
2				0.0	24-30" BRICK fragments		
				7.2	30-42" Brown fine to coarse SAND, some Silt, some medium to coarse Gravel, some BRICK fragments, slight hydrocarbon odor		
4							
				19.8	42-60" Wet, brown fine to coarse SAND, some Silt, some medium to coarse Gravel, some BRICK fragments, slight hydrocarbon odor, NAPL Saturated and NAPL staining, strong hydrocarbon odor		
	5-7' (SS) 3" Spoon	1-3-3-4	18"	115	0-18" Moist, brown fine Sand and angular GRAVEL, some Silt, hydrocarbon odor, NAPL blebs		
6							
	7-9' (SS) 3" Spoon	1-3-2-2	12"	82.9	0-12" Moist, brown fine Sand and angular GRAVEL, some Silt, hydrocarbon odor, NAPL blebs-saturation		
8							
	9-11' (SS) 3" Spoon	2-1-3-7	18"	128	0-18" Moist, brown fine Sand and angular GRAVEL, some Silt, hydrocarbon odor, little Brick, NAPL blebs-saturation		
10							
	11-13' (SS) 3" Spoon	3-1-2-2	18"	161	0-18" Wet, dark brown, SILT and GRAVEL, some fine Sand, Slight fuel oil-like odor, NAPL blebs, sheen present		
12							
	13-15' (SS) 3" Spoon	4-2-2-3	20"	103	0-20" Wet, dark brown fine SAND, some Silt, little coarse angular Gravel, hydrocarbon odor, NAPL blebs, sheen		
14							
	15-17' (SS) 3" Spoon	1-4-5-23	20"	928	0-10" Wet, dark brown fine SAND, some Silt, little coarse angular Gravel, hydrocarbon odor, NAPL blebs-saturation, sheen		
16					10-20" Brown, fine SAND and BRICK, strong hydrocarbon odor		
	17-19' (SS) 3" Spoon	49-50/3"	10"	659	0-10" Light brown, fine SAND, some red Brick and Mortar, strong hydrocarbon odor, NAPL blebs		
18							
	19-21' (SS) 2" Split Spoon	50/5"	5"	2.5	0-5" BRICK and black GNEISSIC SCHIST		
20							
	20-25' (SO) Sonic	---	32"	2.3	0-32" BRICK		
22							
24							
	25-27' (SO, SS) 2" Split Spoon	50/5"	5"	2.8	0-5" BRICK		Mortar is adhered to brick, and different wythes are visible. Sample appears to have fractured at each course (drilling fracture) resulting in a stack of cylinders each roughly 4" tall.
26							
	25-30' (SO) Sonic	---	60"	3.2	0-60" BRICK and MORTAR		
28							
30	30-35' (SO) Sonic	---	60"	2.8	0-60" BRICK and MORTAR		
32							
34							
	35-37' (SO) Sonic	---	24"	3.1	0-12" CONCRETE		
36					12-24" White SCHIST		
					Advanced Sonic casing through rock from 37 to 39.5 ft bgs		
38							
	39.5-44.5' (C) Coring		RQD: 83%		Cored from 39.5 to 44.5': Hard, fresh, white SCHIST, mechanical break in top foot due to sonic. See note 5 below.		
40					39.5-40.5' -> 8 minutes 43.5-44.5' -> 30 minutes		
					40.5-41.5' -> 13 minutes		
42					41.5-42.5' -> 21 minutes		
					42.5-43.5' -> 25minutes		
					End of Boring at 44.5 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON: (3", 2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/19) ; 5 to 19'=Interval sampling with (3")split spoon, 25 to 27'=(2") split spoon, 19 to 37' sonic rig

Rock coring from 39.5 to 44.5', ADT experienced difficulty pulling core barrel. Reverse hammer (300 lb) used. Due to this, no additional core run was performed.

Boring complete to 44.5'; Grouted to surface

Additional Notes:

1. Drilled 4/5/12 by Sean Miller of ADT with CME 85 truck rig with 4 1/4 " HSA. Logging by Sam Monte. Drilled to 19 ft bgs.
2. Drilled 4/11/12 by Chris Stratton of ADT on Rotosonic rig, logging by Zohar Lavy. Drilled to 39.5 ft bgs.
3. Cored 4/13/12 by Chris Migliori of ADT with CME 75 truck rid. Logging by Noah Garguilo.
4. Quantification of NAPL abundance performed by Noah Garguilo on 4/13/12 using bag samples.
5. Core 39.5 to 44.5 ft: No vein dip apparent in rock core. Fractures are mechanical and horizontal except at 24" where fracture is 45 degrees. No staining/weathering on core.

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-10 — Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Sam Monte, Noah Garguilo
Rig Type: Sonic / CME 75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Cloudy, mid 60s
Date/Time Start: 5-8-12, 13:30
Date/Time Finish: 5-11-12, 10:00

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~2'	DTW		
Date	4/27/2012			
Time	1130			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT		Observed Water Level at 2' bgs.
				0.0	8"-2' Brown fine to coarse SAND and COBBLE		
2				0.0	Groundwater encountered at 2 ft bgs		
				0.0	Dig bar advanced to 60" in 3 locations		
4							
	5-10' (SO) Sonic	---	60"	0.2	0-60" Wet, grey fine SAND and Silt, some weathered Schist		
6							
8							
10	10-15' (SO) Sonic	---	42"	1.0	0-18" Soft, wet, brown/grey SILT, trace fine micaceous Sand		
					18-36" CONCRETE		
12				63.7	36-42" Moist, red/brown, micaceous SILT, trace fine Sand, slight hydrocarbon odor		
14							
	15-20' (SO) Sonic	---	48"	1.4	0-12" Wet, dense, red/brown SILT		
16				2.4	12-36" Wet, brown, fine to medium SAND, some Silt		
				0.4	36-48" Wet, red/brown, fine to medium SAND, some Silt, some coarse Gravel		
18							
20	20-25' (SO) Sonic	---	60"	0.9	20-25' Moist, red/brown, fine SAND, some Silt, some Gravel, trace Cobble		
22							
24							
	25-29' (SO) Sonic	---	48"	0.7	0-42" Moist, hard, red/brown, fine to coarse SAND, little to some Gravel, little Silt		
26							
				4.0	42-48" Black, highly weathered GNEISSIC SCHIST, slight hydrocarbon odor		
28							
	29-35' (SO) Sonic	---	48"	---	0-12" Black, weathered GNEISSIC SCHIST		
30					12-48" Black GNEISSIC SCHIST		
32							
34							
	35-40' (SO) Sonic	---	60"	----	0-60" Hard, black GNEISSIC SCHIST		
36							
38							
40	40-45' (C) Coring	---	RQD: 100%	---	Cored from 40 to 45': Hard, black, gneissic SCHIST, occasional red garnets, highly folded with vein dip generally 45° but highly variable. Vein dip changes rapidly throughout sample.		
42					40-41' -> 5 minutes		
					41-42' -> 9 minutes		
					42-43' -> 5 minutes		
					43-44' -> 5 minutes		
44					44-45' -> 7 minutes		
					End of Boring at 45 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/15)
5 to 40'=Interval sampling with and sonic rig (5/8)
40 to 45'=Rock Cored (1 segment, 5/11)
Boring complete to 45' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Straton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 1 of 1 **PDI-11**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	3/30/2012			
Time	1355			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, Up to 56F, Wind: 5-10 S
Date/Time Start: 3/28/12 ; 1330
Date/Time Finish: 4/2/12 ; 1415

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0	0-9" ASPHALT		Observed Water Level at 5 ft bgs
				0	9-18" Moist, brown SILT and GRAVEL, some Brick fragments		
2				0	18-60" Moist, brown SILT and fine SAND, some Cobble		
				0			
4				0			
	5-7' (SS) Spoon	3-4-5-5	8"	1.5	Wet, brown fine to coarse SAND, little fine to coarse subangular Gravel, trace Silt		
6							
	5-10' (SO) Sonic	---	40"	2.2	0-16" Wet, brown fine to coarse SAND, little fine to coarse subangular Gravel, trace Silt		
8					16-36" Wet, dark brown, fine to medium SAND, some blue/green Silt and Clay, little subangular-angular fine to medium Gravel		
					36-40" Wet, dark brown, fine to medium SAND and WOOD, some blue/green Silt and Clay, little sub-angular to angular fine to medium Gravel		
10	10-12' (SS) Spoon	5-21-6-7	12"	2.8	0-8" Moist, dark brown, fine to coarse SAND, little green/olive Silt/Clay, little angular to sub-angular fine-medium Gravel, trace Brick		
					8-12" Moist, dark brown, fine to coarse SAND, little green/olive Silt/Clay, little angular to sub-angular fine-medium Gravel, little weathered black Gneissic Schist, trace Brick		
12	10-15' (SO) Sonic	---	60"	1.7	0-40" Brown, fine to coarse SAND, little gray/olive Clay/Silt, little sub-angular medium to coarse Gravel, trace weathered black Gneissic Schist; 40-60" Orange/brown fine to coarse SAND, little gray/olive Clay/Silt, little subangular medium to coarse Gravel		
14							
	15-17' (SS) Spoon	WOH/18"	14"	0.9	0-10" Wet, brown/orange, fine to medium SAND, some Silt, trace fine angular to sub-angular Gravel, loose; 10-14" Wet, brown/orange, fine to medium SAND, some Silt, very loose		
	15-20' (SO) Sonic	---	10"	3.2	Wet, brown, fine to medium SAND, little Silt, little black Gneissic Schist, trace angular to sub-angular fine to coarse Gravel, very loose		
18							
20	20-22' (SS) Spoon	5-2-1-1	2"	0.8	Wet, dark brown/black, fine SAND, trace Mica		
22	20-25' (SO) Sonic	---	0	-	No Recovery		
24							
	25-27' (SS) Spoon	6-7-3-3	8"	37.5	Wet, brown, fine to medium SAND, some Brick, little weathered black Gneissic Schist, trace Silt, slight hydrocarbon odor, sheen		
26							
	25-30' (SO) Sonic	---	20"	140.0	Wet, brown, fine to medium SAND, some Silt, little Brick, little weathered black Gneissic Schist, trace Glass, slight hydrocarbon odor, sheen		
28							
30	30-32' (SS) Spoon	8-8-6-6	10"	184	Black, fine to medium SAND, trace Mica, trace sub-angular coarse Gravel, trace weathered black Gneissic Schist		
32	30-35' (SO) Sonic	---	20"	75	Wet, brown/gray, fine to medium SAND, some sub-angular to round fine to coarse Gravel, trace Brick, track black Gneissic Schist, hydrocarbon odor		
34							
	35-37' (SS) Spoon	1/12" , 50/0"	4"	259	Brown/gray, medium to coarse SAND, NAPL blebs, hydrocarbon odor		
36							
	35-40' (SO) Sonic	---	14"	-	METAL, BRICK and grey/green GNEISSIC SCHIST		
38							
40	40-42' (SS)	50/0"	1"	-	Subangular medium GRAVEL and GNEISS		
	40-41' (SO) Sonic	---	12"	875	0-9" Gray, medium to coarse SAND, hydrocarbon odor		
					9-12" Gray/white, SCHIST, trace Metal		
	41-46' (C) Coring	---	Recovery: 51" RQD: 85%		Cored from 41 to 46' bgs: Gray SCHIST with quartz veins (9 segments)		
					41-42' -> 15 minutes		
42					42-43' -> 13 minutes		
					43-44' -> 26 minutes		
44					44-45' -> 30 minutes		
					45-46' -> 46 minutes		
					End of Boring at 46 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
WH = Weight of Hammer
C = CORED

0 to 5'=Hand-Clearance (3/16)
5 to 41'=Interval sampling with split spoon and sonic rig
41 to 46'=Rock Cored (9 segments)
Boring complete to 46' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-12 (Sheet 1 of 1)
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~3.5	DTW		
Date	3/19/2012			
Time	1330			
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, Up to Mid-60s
Date/Time Start: 4/3/12 ; 1000
Date/Time Finish: 4/4/12 ; 1140

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-10" CONCRETE		
				0.0	10-24" Brown, fine to medium SAND, some Silt and medium to coarse Gravel, little Brick fragments and Wood chips;		
2				0.0	24-42" Brown, fine SAND, some Silt, little medium to coarse Gravel, little Brick and Concrete fragments; Groundwater encountered at 42" bgs		Observed Water Level at 3.5 ft bgs
4					Dig bar advanced to 60" in several locations		
	5-7' (SS) Spoon	4-12-6-3	8"	2.8	0-4" Wet, dark brown, medium SAND, some angular fine to medium Gravel, trace Silt		
6					4-8" Wet, tan/brown, medium to coarse SAND, trace Gneiss		
	5-10' (SO) Sonic	---	50"	7.8	0-20" Wet, tan/brown, medium to coarse SAND, trace Gneiss, trace sub-angular to angular medium to coarse Gravel		
8					20-50" Wet, dense, brown/orange, fine to coarse SAND, some sub-angular to round fine to medium Gravel, trace Gneiss, trace Silt		
10	10-12' (SS) Spoon	7-10-11-13	12"	122	0-10" Wet, dense, brown/orange, fine to coarse SAND, some sub- angular to round fine to medium Gravel, trace Gneiss, trace Silt		
					10-12" Olive/brown, fine to coarse SAND, some fine to medium sub-angular to sub-round Gravel		
12	10-15' (SO) Sonic	---	10"	163	0-10" Wet, black, fine to coarse SAND, some fine to medium sub-angular Gravel, little coarse round Gravel, strong hydrocarbon odor, Schist Cobble/Boulder in sonic cutting		
14	12.5-14' (SO)	---	29.5"	-	Cored from 12.5 to 14': 0-29.5" Gray/tan SCHIST with some rose quartz. (6 segments)		
	14-22.4' (C) Coring	---	Recovery: 52" RQD: 73%	-	Cored from 14 to 22.4': 0-9" Coarse grained grey SCHIST, white quartz garnets; 9-16" Rose QUARTZ-SCHIST; 16-52" Coarse grained grey SCHIST, white quartz garnets		NAPL observed in wash water while coring from 19-19.5 ft bgs
16					14-15' -> 15 minutes 19-20' - > 18 minutes		
					15-16' -> 24 minutes 20-21' - > 20 minutes		
18					16-17' -> 13 minutes 21-22.4' - > 17 minutes		
					17-18' -> 15 minutes		
					18-19' -> 17 minutes		
20							
					End of Boring at 22.4 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/19)
5 to 12.5=Interval sampling with split spoon and sonic rig
12.5 to 22.4'=Rock Cored (17 segments)
Boring complete to 22.4' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Straton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-13 Sheet 1 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/5/2012			
Time	1100			
Meas. From	Split Spoon	Top of Casing		

Weather: High 50s, breezy
Date/Time Start: 4/5/12 ; 1042
Date/Time Finish: 4/10/12 ; 1145

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT		
				0.0	8-24" Moist, gray, medium to coarse SAND, some Silt, some medium to coarse Gra		
2					24-36" ASPHALT		
					36-42" COBBLE		
4					48-60" Moist, gray, medium to coarse SAND, some Silt, little Cobble		Observed Water Level at 5 ft bgs
	5-7' (SS) Spoon	6-1-2-3	0"	-	No Recovery		
6							
	5-10' (SO) Sonic	---	26"	111.0	Wet, black, fine to coarse SAND, some fine to coarse sub-angular Gravel, little Brick, trace Silt, trace Wood, NAPL/tar coated, hydrocarbon odor		
8							
10	10-12' (SS) Spoon	3-4-5-4	10"	189	Wet, black, medium to coarse SAND, some fine to coarse subangular-subround Gravel, trace Brick, NAPL blebs-saturation		
	10-15' (SO) Sonic	---	24"	73.2	Black fine to coarse SAND, little fine to coarse sub-angular Gravel, trace Brick, trace Wood, NAPL saturation, strong hydrocarbon odor, staining, sheens		
12							
14							
	15-17' (SS) Spoon	12-12-50/3"	8"	86.5	BRICK and WOOD, little sub-angular fine to medium Gravel, hydrocarbon odor, sh		
16							
	15-20' (SO) Sonic	---	60"		0-12" WOOD		
18					12-60" BRICK		
20	20-22' (SS) Spoon	50/5"	0"	-	No Recovery		
22	20-25' (SO) Sonic	---	24"	12.7	Wet, highly weathered BRICK, some angular medium to coarse Gravel, trace fine to coarse Sand		Sonic sampler refusal at 22 ft bgs
24							
	25-27' (SS) Spoon	17-50/3"	6"	18.6	Wet, BRICK and MORTAR		
26							
	25-30' (SO) Sonic	---	60"	5.2	Wet, BRICK and MORTAR		
28							
30	30-32' (SS) Spoon	23-35-50/1"	12"	3.1	Wet, BRICK and MORTAR		
32	30-35' (SO) Sonic	---	60"	2.7	Wet, BRICK and MORTAR		
34							
	35-37' (SS) Spoon	15-22-50/2"	10"	2.5	Wet, BRICK and MORTAR		
36							
	35-40' (SO) Sonic	---	60"	2.6	0-36" Wet, BRICK and MORTAR		
38					36-60" Grey SCHIST and CONCRETE		

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/20)
5 to 20'=Interval sampling with split spoon and sonic rig
40 to 44.5'=Rock Cored (6+ segments)
Boring complete to 44.5' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-13 Sheet 2 of 2

Contractor: Advanced Drilling Technology
Driller: Chris Straton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/5/2012			
Time	1100			
Meas. From	Split Spoon	Top of Casing		

Weather: High 50s F, breezy
Date/Time Start: 4/5/12 ; 1042
Date/Time Finish: 4/10/12 ; 1145

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
40	40-44.5' (C) Coring	---	Recovery: 43" RQD: 79%		Cored from 40 to 44.5': Gray SCHIST with quartz veins (6+ segments)		NAPL observed in wash water while coring at 42.5 ft bgs
					40-41' -> 15 minutes		
42				---	41-42' -> 22 minutes		
					42-43' -> 17 minutes		
44					43-44' -> 40 minutes		
					44-44.5' -> 30 minutes		
					End of Boring at 44.5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/20)
5 to 20'=Interval sampling with split spoon and sonic rig
40 to 44.5'=Rock Cored (6+ segments)
Boring complete to 44.5' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Only Hand Cleared
Inspector: Lopa Naik
Rig Type: Vactron

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-14 Sheet 1 of 1
Location Description: West 45th Street, Manhattan, NY

Location Plan
See Site Plan

Weather: Partly Cloudy, low 70s
Date/Time Start: 3/19/12; 0800
Date/Time Finish: 3/19/12; 0930

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	3/19/2012			
Time	930			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT 8-48" Brown medium to coarse SAND, some Silt and fine to medium Gravel 48-54" BRICK 54-60" Moist, brown medium to coarse SAND, some Silt, little fine to medium Grav		Observed Water Level at 5 ft bgs
2							
4							
					End of Boring at 5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/19)
This PDI location was not drilled because of field observations at PDI-12, PDI-13, and PDI-15.

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic, CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-15 (Sheet 1 of 1)
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	5/14/2012			
Time	1210			
Meas. From	Split Spoon	Top of Casing		

Weather: Cloudy, mid 60s, rain
Date/Time Start: 5/14/12; 1050
Date/Time Finish: 5/17/12 0945

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT		Observed Water Level at 5 ft bgs
				0.0	8-17" Moist, brown SILT and GRAVEL some Sand and Brick fragments		
2				0.0	17-21" Moist, tan SILT, some Sand		
				0.0	17-48" Moist, brown SILT, some Sand		
4					48-60" Moist, brown SILT, some Sand and fine to coarse Gravel, little Cobble		
	5-7' (SS) Spoon	2-2-2-3	14"	483.0	0-6" Wet, brown/grey fine to medium SAND, some angular to sub-angular fine to medium Gravel; 6-14" Moist, brown/dark grey fine to medium SAND, trace sub-angular fine Gravel		
6							
	5-10' (SO) Sonic	---	30"	389.0	0-12" Wet, brown/grey fine to coarse SAND, some sub-angular to sub-round fine to medium Gravel; 12-20" Wet, brown/dark grey fine to medium SAND, trace Silt, hydrocarbon odor, slight sheen; 20-30" Wet, dark grey/black fine to medium SAND, little Silt, staining		
8							
10	10-12' (SS) Spoon	2-3-50/3"	6"	1188.0	Wet, black/orange fine to medium SAND, trace Silt, strong hydrocarbon odor, NAPL blebs, staining, sheens; White Schist in tip of cutting shoe		
12	10-13' (SO) Sonic	---	36"	---	0-12" Wet, black/orange fine to medium SAND, some white Schist, trace Silt, strong hydrocarbon odor, NAPL blebs, staining, sheens; 12-36" White SCHIST		
	13-18' (C) Coring	---	Recovery: 60" RQD: 83%	---	Cored from 13 to 18': Hard, white, SCHIST, very abundant rose Quartz, occasional 1/4"-1/2" veins of black Gneissic Schist from 45-60" with 90° dips, fractures at 7", 39" and 48"; closed vertical fracture from 48-55" along Gneissic Schist vein		
14							
16					13-14' - >10 minutes 17-18' - >11 minutes		
					14-15' - > 12 minutes		
					15-16' - >9 minutes		
					16-17' - > 10 minutes		
18	18-23' (C) Coring	---	Recovery: 56" RQD: 90%		Cored from 18 to 23 ft bgs: Hard, white SCHIST, abundant rose Quartz, no vein dip; NAPL coating throughout core; a 45° fracture at 12" is lightly weathered and black stained; additional 10° fractures at 37" and 39"		
20					18-19' - > 12 minutes 22-23' - > 10 minutes		
					19-20' - >10 minutes		
					20-21' - > 13 minutes		
22					21-22' - > 10 minutes		
					End of Boring at 23 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON: 2"
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/15)
5 to 13'=Interval sampling with split spoon (2 ") and sonic rig
13 to 23'=Rock Cored
Boring complete to 23' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: C. Jenkins / C. Migliori
Inspector: Noah Garguilo
Rig Type: Sonic / CME 75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-16 (Sheet 1 of 1)
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	5/9/2012			
Time	1105			
Meas. From	Sonic Sampler	Top of Casing		

Weather: Rain, low 60s
Date/Time Start: 5/9/12; 1105
Date/Time Finish: 5/14/12; 1000

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT		
				0.0	8-60" Brown fine to coarse SAND, some Concrete and Cobble, little brick		
2							
4							Observed Water Level at 5 ft bgs
	5-10' (SO) Sonic	---	42"	1.4	0-24" Wet, soft, brown, fine to coarse SAND, little sub-round Gravel, trace Silt		
6							
					24-30" Black, weathered GNEISSIC SCHIST		
8				0.3	30-42" Moist, firm, brown, fine SAND, little Gravel, trace Silt		
10	10-15' (SO) Sonic	---	15"	0.4	0-15" Wet, soft, brown, medium SAND and weathered GNEISSIC SCHIST, trace Gravel, trace Silt, slight hydrocarbon odor		
12							
14							
	15-20' (SO) Sonic	---	48"	0.2	0-42" Moist, firm, brown (green and red mottled), fine SAND, little Gravel, trace Cobbles, trace Silt, trace porcelain		
16							
18					42-48" Moist, firm, dark grey, SAND, some Gravel		
20	20-25' (SO) Sonic	---	0"	---	20-25': No Recovery, abundant NAPL in return water from 22-25' bgs. Difficult drilling 22 to 25': possibly metal		
22							
24							
	25-30' (SO) Sonic	---	12"	44.8	0-0.5" METAL		Two 1/4" plate steel sections oriented horizontally (possibly pushed down from 22 to 25' zone).
26					0.5-12" Brown, CONCRETE, some Sand and Gravel		
28							
30	30-32' (SO) Sonic		24"		0-24": Hard, white SCHIST		
32	32-37' (C) Coring		Recovery: 60" RQD: 90%	---	Cored from 32 to 37': Hard, white SCHIST; no folding or vein dip apparent; existing fractures at 14" (slight rust color staining), 16", and 40", fractures at 16" and 40" exhibit black staining - possibly NAPL; NAPL coating in small area at 16"; existing fractures are planar at 0-20°		
34					32-33' -> 13 minutes		
					33-34' -> 18 minute		
					34-35' -> 16 minutes		
36					35-36' -> 20 minutes		
					36-37' -> 20 minute		
					End of Boring at 37 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Cleared
5 to 32=Sonic rig
32 To 37=Rock Cored (1 segment)
Boring complete to 37' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-17 (Sheet 1 of 1)

Contractor: Aquifer Drilling & Testing Inc.
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	3/12/2012			
Time	1230			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, high 60s
Date/Time Start: 3/12/12 ; 1200
Date/Time Finish: 3/14/12 ; 1330

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	-	0-10" ASPHALT 10-36" Brown, fine to coarse SAND, some sub-angular to round fine to medium, Gravel, little Cobble, trace Gneissic Schist, trace Brick 36-60" Moist, brown, fine to coarse SAND, some round Cobble, little sub-angular Gravel		
2							
4				0.2			Observed Water Level at 5 ft bgs
6	5-7' (SS) Spoon	6-2-2-3	14"	2.3	0-11" Moist, dark brown, fine to coarse SAND, little to some Silt, Brick fragments at 9"		
8	7-9' (SS) Spoon	4-7-8-6	12"	2.3	0-5" Moist to wet, dark brown, fine to coarse SAND, some Silt 5-9" Black, micaceous, GNEISSIC SCHIST 9-12" Moist, dark brown, coarse SAND, some micaceous, Gneissic Schist		
10	9-11' (SS) Spoon	3-2-2-2	6"	473	0-6" Wet, dark brown, fine to coarse SAND, some Gravel, little Silt, Brick in drive shoe, strong Naphthalene odor		
12	11-13' (SS) Spoon	5-6-8-2	15"	271	0-15" Wet, gray SAND, some Gravel, little Silt, Brick in drive shoe, brown NAPL bleb at 7"		
14	13-15' (SS) Spoon	2-2-2-2	0"	-	No Recovery Brick fragment in drive shoe		
16	15-17' (SS) Spoon	1-2-2-2	0"	38.5	No Recovery Rock fragment in drive shoe		
18	17-19' (SS) Spoon	1-3-3-3	10"	39.8	0-10" Wet, dark brown, fine to coarse SAND, trace Silt, rock fragment in drive shoe		
20	19-21' (SS) Spoon	5-3-1-5	6"	33.2	0-6" Wet, dark brown, fine to coarse SAND, little brick fragments, trace Silt		
22	21-23' (SS) Spoon	2-3-4-5	20"	87.5	0-6" Wet, dark brown, fine to coarse SAND, little Silt, little fine Gravel 6-20" Wet, gray/brown, fine SAND and SILT, trace black fibrous rope fragments, trace		
24	23-25' (SS) Spoon	1-5-5-7	1"	34.2	0-1" Wet, dark brown, medium to coarse SAND, trace Silt, trace Gravel, trace Brick, rock fragment stuck in drive shoe		
26	25-27' (SS) Spoon	8-16-10-4	12"	94.3	0-4" Wet, dark brown, fine to coarse SAND 4-12" Wet, gray-brown, fine to medium SAND, some Silt, little black organic material, trace Gravel		
28	27-29' (SS) Spoon	4-3-3-3	11"	24.2	0-11" Wet, gray-brown, fine to medium SAND, some Silt and Brick, trace Gravel, trace porcelain, trace glass, trace black weathered rope		
30	29-31' (SS) Spoon	3-3-4-4	18"	157	0-18" Wet, gray-brown, fine to coarse SAND, some Gravel, trace Brick, trace black organic matter		
32	31-33' (SS) Spoon	13-4-5-5			No sample retrieved, drive shoe damage, unable to open split spoon		
34	33-35' (SS) Spoon	50/3"	3"	994	0-3" Moist, brown, medium to coarse SAND, trace micaceous, Gneissic Schist, brick in drive shoe		
36	35-37' Augered	-	-	-	Augered to 37' bgs, augers grinding		
	37-37.75' (SS) Spoon	10-50/3"	9"	1955	0-5" Brown, fine to medium SAND, trace Gravel, strong hydrocarbon odor; 5-8" BRICK; 8-9" Black micaceous SCHIST and QUARTZ		
38	38-38.1' (SS)	50/1"	1"	124	0-1" White with black flecked, QUARTZ and SCHIST		
		-	-	-	Roller bit to 39'		
40	39-42' (C) Coring		Recovery: 12" RQD: 0		Cored from 39 to 42' bgs: 0-12" Hard, fresh, white, coarse grained, micaceous SCHIST, abundant Quartz garnets 39-40' -> 10 minutes 40-41' -> 6 minutes 41-42' -> 35 minutes		
44	42-45' (C) Coring		Recovery: 36" RQD: 81%		Cored from 42 to 45' bgs: 0-12" Hard, fresh to slightly weathered, white, micaceous SCHIST, occasional white-rose Quartz garnets 42-43' -> 21 minutes 43-44' -> 15 minutes 44-45' -> 15 minutes		
					End of Boring: 45'		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/8)
5 to 38'=Interval sampling with split spoon and augers
39 to 45'=Rock Cored
Boring complete to 45' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-18/MW-23 (Sheet 1 of 1)

Contractor: Advanced Drilling Technology
Driller: Chris Migliori, Chris Stratton
Inspector: Noah Garguilo, Zohar Lavy
Rig Type: CME-75, Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~4.5 ft bgs	DTW 0.24' bgs		
Date	3/7/2012	6/18/12		
Time	1000	0800		
Meas. From	Hand Clearance	Top of Casing		

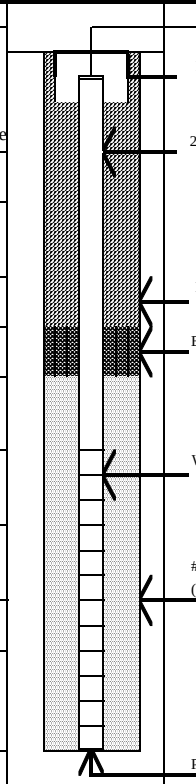
Weather: Partly cloudy, low 70s
Date/Time Start: 3/20/12; 1330
Date/Time Finish: 3/30/12; 0920

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL
0	Vac-Tron	Hand-Cleared	---	0.0	0-10" ASPHALT; 10-36" Moist, brown, fine to coarse SAND, some sub-angular to round fine to medium, Gravel, trace Brick, trace Silt, trace Metal; 36-54" Moist, brown, fine to coarse SAND, some sub-angular to round fine to medium, Gravel, trace Brick, trace Silt; 54-70" Wet, brown, fine to coarse SAND, some sub-angular to round fine to medium, Gravel, trace Brick, trace Silt; 60-70" Boulder on west side
				0.0	
2				0.0	
				0.0	
4					
	5-7' (SS) 2" Spoon	1-2-1-1	6"	5.2	Wet, angular to sub-angular fine to coarse GRAVEL and weathered black GNEISSIC SCHIST
6					
	7-9' (SS) 2"	1-1-5-3	8"	4.7	0-2" Wet, angular to sub-angular fine to coarse GRAVEL and weathered black GNEISSIC SCHIST, little fine brown/grey Sand; 2-8" Wet, brown/grey fine to medium SAND, some Silt, little angular to sub-angular medium to coarse Gravel
8					
	9-11' (SS) 3"	1-2-5-6	10"	3.3	Brown/grey fine to medium SAND, little Silt, little angular to sub-angular Gravel, trace weathered black Gneissic Schist
10					
	11-13' (SS) 3" Spoon	3-5-14-18	8"	4.0	Wet, black, white, rose angular to sub-angular fine SAND and coarse GRAVEL, little black Gneissic Schist
12					
	13-15' (SS) 3" Spoon	8-20-28-20	15"	22.9	0-12" Wet, black, white, rose angular to sub-angular coarse SAND and fine GRAVEL; 12-15" Weathered black GNEISSIC SCHIST and WOOD
14					
	15-17' (SS) 3" Spoon	8-10-13-7	8"	5.5	0-3" Weathered black GNEISSIC SCHIST and WOOD, trace Quartz garnet; 3-5" Wet, brown and green/grey SILT, trace coarse Sand, trace fine Gravel, trace Wood; 5-8" Black, slightly weathered GNEISSIC SCHIST
16					
	17-19' (SS) 3" Spoon	4-5-8-13	11"	0.9	0-6" Wet, weathered to slightly weathered GNEISSIC SCHIST, little brown/grey fine to coarse Sand, trace Gravel, trace Wood; 6-11" Wet, brown, fine to medium SAND, little angular to sub-angular Gravel, trace Silt
18					
	19-21' (SS) 3" Spoon	20-50/2"	0"	---	No Recovery
20					
					Core attempted from 19 ft bgs; casing became stuck and coring was abandoned. Ran roller bit to 25 ft bgs
22					
24					
	25-30' (C) Coring	---	Recovery: 60" RQD: 75%	---	Cored from 25 to 30': 0-26" Light grey/tan SCHIST; 26-60" Grey SCHIST; a 45° fracture at 24" is lightly weathered and black stained
26					
					25-26' - > 16 minutes
28					26-27' - > 14 minutes
					27-28' - > 13 minutes
					28-29' - > 17 minutes
					29-30' - > 20 minutes
					End of Boring at 30 ft bgs

SCHEMATIC



COMMENTS

Boring was grouted from 30 to 25 ft bgs prior to well install

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON (2" and 3")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Cleared
5 to 19' =Split spoon sampling; 19-25' = Roller Bit
25 to 30' = Rock Cored
Boring complete to 30' bgs; Grouted to 25 ft bgs; install MW-23 to 25 ft bgs (2" well)

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-19 — Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chirs Stratton, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW 4'	DTW		
Date	3/20/2012			
Time	900			
Meas. From	Split Spoon	Top of Casing		

Weather: Rain, high 60s
Date/Time Start: 5/15/12; 1015
Date/Time Finish: 5/17/12; 1415

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT		
				0.0	8-24" Moist, gray fine to medium SAND, some Silt, little fine to medium Gravel		
2					24-25" CONCRETE		
				0.0	25-48" Moist, gray fine to medium SAND, some Silt, little fine to medium Gravel		Observed Water Level at 4 ft bgs
4					48-60" Wet, gray fine to coarse SAND, some Silt, some medium to coarse Gravel		
	5-7' (SS)	14-20-10-12	10"	2.2	Wet, Sub-angular to sub-round fine to medium GRAVEL, some fine to coarse brown Sand, little Brick, little weathered Gneissic Schist		
6							
	5-10' (SO) Sonic	---	24"	6.4	0-8" Wet, GNEISS and SCHIST, some angular to sub-round fine to coarse Gravel, trace Wood, trace Brick; 8-16" Moist, brown/grey fine to medium SAND, some sub-angular to sub-round fine to medium Gravel, trace weathered Gneissic Schist, trace Brick; 16-20" GNEISSIC SCHIST; 20-24" Moist, brown/light red fine SAND, some sub-angular to round fine Gravel, trace Silt		
8							
10	10-12' (SS) Spoon	1-1-2-1	6"	3.8	Wet, orange/tan fine to medium SAND, some weathered Gneissic Schist, trace Silt		
12	10-15' (SO) Sonic	---	40"	3.8	0-20" Wet, orange/tan fine to medium SAND, some weathered Gneissic Schist, trace Silt; 20-40" Wet, grey fine to medium SAND, some weathered Gneissic Schist, little fine to medium sub-angular Gravel, trace Concrete, black staining,		
14				15.7			
	15-17 (SS) Spoon	1-3-4-5	10"	19.3	Wet, brown/grey fine to medium SAND, little sub-angular to sub-round fine Gravel, little weathered Gneissic Schist, trace Silt		
16							
18	15-20' (SO) Sonic	---	42"	43.6	0-20" Wet, brown/grey fine to medium SAND, little sub-angular to sub-round fine Gravel, little weathered Gneissic Schist, little Concrete, trace Silt; 20-36" Brown/grey fine to medium SAND and weathered GNEISSIC SCHIST, little fine to medium sub-angular to sub-round Gravel, trace Silt, trace Brick; 36-42" Weathered GNEISSIC SCHIST		
				13.8			
20	20-22' (SS) Spoon	50/0"	0	---	No Recovery		
22	20-25' (SO) Sonic	---	6"	---	GNEISSIC SCHIST		
24							
26	25-30' (SO) Sonic	---	40"	77.5	0-12" Wet, grey, fine to medium SAND and weathered GNEISSIC SCHIST, little Concrete, trace Brick		
				68.1	12-34" Brown/red fine to medium SAND, little black Gneiss, little Brick, trace round medium Gravel		
28				81.2	34-40" GNEISSIC SCHIST		
30	30-32' (SS) Spoon	50/0"	0	---	No Recovery		
32	33-35' (SO) Sonic	---	24"	---	White/tan SCHIST		Pushed Sonic sampler to 33 and casing to 35'
34							Roller bit to 36' due to loose rock
36	36-40.7'(C) Coring	---	Recovery: 56" RQD: 64%	---	Cored from 36'-40.7': 0-56" Hard White SCHIST, no vein dip present; 45° fracture at 4", 40° fracture at 18", 30° fracture at 41" with rust staining; a fracture at 25" exhibiting rust and black staining		
38					36-37' - > 16 minutes 39-40' - > 19 minutes 37-38' - > 16 minutes 40-40.7' - > 35 minutes		
40					38-39' - > 10 minutes		
					End of Boring at 40.7 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/20)
5 to 35'=Interval sampling with split spoon and sonic rig
36 to 40.7'=Rock Cored
Boring complete to 40.7' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-20 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Migliouri, Frank Quin
Inspector: Noah Garguilo
Rig Type: CME75 Drive and Wash

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Rain, high 60s
Date/Time Start: 5-15-12, 7:15
Date/Time Finish: 5-17-12, 11:00

GROUNDWATER OBSERVATIONS

Water Level	DTW ~2.5'	DTW		
Date	3/8/2012			
Time	1230			
Meas. From	Split Spoon	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-cleared	---	---	0-20" ASPHALT 10-30" Wet, dark brown SAND, some Gravel, trace cobbles, trace Silt,trace Bricks Encountered ground water at 30" bgs. Dig bar advanced to 60" in several locations		Observed Water Level at 2.5 ft bgs
2							
4							
6	N/A				No soil information 5-10' bgs: Spun casing to 8' bgs. Casing sank down when attempting to collect 8-10' spoon. Advanced casing to 10' bgs.		
8							
10	10-12' (SS) Spoon	3-3-3-3	3"	1	0-3" Moist, black, fine SAND and fine GRAVEL, little Coal fragments, slight hydrocarbon odor		
12	12-14' (SS) Spoon	1-WOH-1-WOH	3"	17.1	0-3" Moist, olive, fine to medium SAND, little fine Gravel and Coal		
14	14-16' (SS) Spoon	1-1-1-1	4"	0.1	0-4" Moist, olive, fine SAND, some Silt, little to some Gravel, Brick in drive shoe		
16	16-18' (SS) Spoon	Weight of Rod	0	---	16-18' No Recovery		
18	18-20' (SS) Spoon	1-1-2-2	12"	0.1	0-12" Moist, olive (with red/green banding), fine SAND, some Silt, some Gravel		
20	20-22' (SS) Spoon	3-3-4-4	6"	0.2	0-6" Olive (red/green banded), fine SAND, some Silt, little Gravel, trace weathered Gneissic Shist, trace Brick fragments		
22	22-24' (SS) Spoon	7-4-50/4"	6"	0.2	0-6" Moist, olive, fine SAND, some Silt, little Gravel, trace Brick		
24	23.5-28.5' (C) Coring		RQD: 55%	60"	Cored from 23.5 to 28.5': Hard, fresh, white SCHIST, fine grained; abundant existing fractures to 30" (20-30° fractures, non-planar); rock quality increases below 30"; existing fractures at 33", 36", 40", and 57" (45° planar, 33" fracture is horizontal); NAPL in wash water 24-28' bgs 25.5-26.5' -> 10 minutes 26.5-27.5' -> 1 minutes 27.5-28.5' -> 5 minutes 28.5-29.5' -> 5 minutes 29.5-30.5' -> 1 minutes		
26							
28							
30	28.5-33.5' (C) Coring		RQD: 95%	60"	Cored from 28.5 to 33.5': 0-12": Hard, fresh, white SCHIST; 12-60": Hard, fresh, black, gneissic SCHIST, mechanical break at 12" at rock change, highly folded with vein dip ranging from +45° to -45° 28.5-29.5' -> 10 minutes 29.5-30.5' -> 4 minutes 30.5-31.5' -> 12 minutes 31.5-32.5' -> 6 minutes 32.5-33.5' -> 8 minutes		
32							
					End of Boring at 33.5 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON (3")
WH = Weight of Hammer
C = CORED

0 to 5'=Hand-Clearance (3/8/12).
10 to 23.5'=Interval sampling with split spoon.
23.5' to 28.5' and 28.5' to 33.5' = Rock Cored.
Boring complete to 33.5' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-21 (Sheet 1 of 2)

Contractor: Advanced Drilling Technology
Driller: Chris Mason
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan
See Site Plan

Weather: Clear, low 60s
Date/Time Start: 4/24/12; 0845
Date/Time Finish: 4/24/12; 1330

GROUNDWATER OBSERVATIONS

Water Level	DTW ~5 ft bgs	DTW		
Date	4/24/2012			
Time	900			
Meas. From	Sonic Sampler	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-cleared	---	0.0	0-8" ASPHALT		
				0.0	8"-60" Moist, brown, fine to medium SAND, some Silt and medium to coarse Gravel		
2							
4							Observed Water Level at 5 ft bgs
	5-10' (SO) Sonic	---	48"	36.8	0-20" Wet, brown, fine to coarse SAND and fine to coarse sub-angular to round GRAVEL, trace Wood, trace Metal, hydrocarbon odor		
6							
				5.4	20-48" Moist, grey/orange fine to medium SAND, little fine to medium sub-angular to round Gravel, trace Metal, trace Gneiss, trace Silt, hydrocarbon odor		
8							
10	10-15' (SO) Sonic	---	0"	---	No Recovery; Dark Brown NAPL noted on casing		
30							
12							
14							
	15-20' (SO) Sonic	---	36"	38.0	0-12" Wet, dark grey, fine SAND, trace fine sub-round Gravel, trace Wood, trace Silt, NAPL blebs, hydrocarbon odor, sheen		
16							
				382.0	12-30" Wet, dark brown fine to medium SAND, little Silt, little fine to coarse sub-angular to sub-round Gravel, trace Gneiss, hydrocarbon odor		
18							
					30-36" Weathered micaceous GNEISS, slight hydrocarbon odor		
20	20-25' (SO) Sonic	---	50"	3569.0	0-18" Wet, soft, grey fine to coarse SAND, some fine sub-angular to sub-round Gravel, hydrocarbon odor, slight sheen; 18-36" Moist, weathered GNEISS and grey fine to coarse SAND, trace Metal wire, trace Wood; 36-48" Olive/grey fine to medium SAND, trace Silt, trace Schist; 48-50" SCHIST, NAPL coated/saturated		
22							
24							
	25-30' (SO) Sonic	---	40"	9999.0	0-30" Wet, dark grey/brown fine to medium SAND, trace Mica, trace hair, NAPL blebs to saturation, hydrocarbon odor, slight sheen; 30-40" Wet, dark grey/brown fine to medium SAND and BRICK, trace Mica, trace hair, trace medium to coarse round Gravel, NAPL blebs, hydrocarbon odor, slight sheen		
26							
28							
30	30-35' (SO) Sonic	---	60"	1127.0	0-50" Moist to dry, BRICK and MORTAR		
					50-60" Wet, BRICK and MORTAR		
32							
34							

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/20/12).
5'-45'=Interval sampling Sonic
Rock Core not conducted in this location due to artesian conditions
Boring complete to 45' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-21 Sheet 2 of 2

Contractor: Advanced Drilling Technology
Driller: Chris Mason
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	4/24/2012			
Time	900			
Meas. From	Sonic Sample	Top of Casing		

Weather: Clear, low 60s
Date/Time Start: 4/24/12; 0845
Date/Time Finish: 4/24/12; 1330

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
36	35-40' (SO) Sonic	---	60"	1511.0	CONCRETE		
38							
40	40-45' (SO) Sonic	---	18"	108.0	Weathered, white and grey SCHIST COBBLE, little Gneiss		
42							
44							
					End of Boring at 45 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/20/12).
5'-45'=Interval sampling Sonic
Rock Core not conducted in this location due to artesian conditions
Boring complete to 45' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Jenkins
Inspector: Noah Garguilo
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-22 Sheet 1 of 1
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~2.5 ft bgs	DTW		
Date	3/15/2012			
Time				
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, low 60s
Date/Time Start: 5/10/12; 9:45
Date/Time Finish: 5/10/12; 13:00

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	---	---		0-6" ASPHALT 6-36" Moist, brown fine to coarse SAND, some Gravel and Brick, trace to little Cobbles, trace Silt, bricks becoming more abundant with depth Encountered ground water at 30" bgs. Dig bar advanced to 60" in several locations		Observed Water Level at 2.5 ft bgs
2							
4							
6	5-10' (SO) Sonic	----	12"	14.8	0-12" Wet, soft, dark brown, fine SAND, some fine to coarse subangular Gravel, little to some weathered Gneissic Schist and Porcelain, trace Plastic		
8							
10	10-15' (SO) Sonic	---	6"	17.6	0-6" Weathered, black GNEISSIC SCHIST		
12							
14							
16	15-20' (SO) Sonic	---	36"	105	0-24" Wet, black, fine SAND, little weathered Gneissic Schist, trace Slate, trace brick/mortar/glass, rare NAPL blebs 24-36" Wet, black, medium to coarse SAND and GRAVEL, some Slate and Brick/Mortar, rare NAPL blebs, slight hydrocarbon odor		
18							
20	20-25' (SO) Sonic	---	30"	1880	0-30" NAPL saturated WOOD (oval slats with metal bands, metal has oval holes 1/4" apart, snugly fit with wood)		
22							
24							
26	25-30' (SO) Sonic	----	48"	249 642 684	0-18" CONCRETE 18-36" Wet, brown SAND and GRAVEL, some black Gneissic Schist 36-48" Brown/black SAND, some Gravel, trace Cobbles, trace Wood (with nail), NAPL staining slight sheens, staining heaviest in and near wood		
28							
30	30-33.5' (SO) Sonic	----	32"	2289 16.8	0-4" White, fresh to weathered SCHIST, thin NAPL coating, NAPL saturated Wood 4-26" White, hard, fresh SCHIST, NAPL stained, no free NAPL		
32					26-32" White, hard, fresh SCHIST, NAPL stained		
					End of Boring at 33.5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/15)
5 to 33.5'=Sonic rig (5/10)
Rock Core not conducted in this location due to artesian conditions
Boring complete to 33.5' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-23 (Sheet 1 of 1)
Location Description: West 45th Street, Manhattan, NY

Weather: Clear, mid 70s
Date/Time Start: 5/17/12; 0905
Date/Time Finish: 5/17/12; 1400

Location Plan
See Site Plan

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	5/17/2012			
Time	905			
Meas. From	Split Spoon	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0				0.0	0-8" ASPHALT		
				0.0	8-60" Brown fine to coarse SAND and sub-angular to sub-round medium to coarse GRAVEL, some Cobble, trace Brick - Wood at 4.5'		
2	Vac-Tron	Hand-Cleared	---	0.0			
				0.0			
4				0.0			
	5-7' (SS)	12-6-8-14	4"	1.7	Wet, weathered GNEISSIC SCHIST, some sub-angular medium Gravel, trace Wood		Observed Water Level at 5 ft bgs
6		---	48"	29.8	0-16" Wet, brown/grey medium to coarse SAND and fine to coarse sub-angular to round Gravel, trace Wood		
	5-10' (SO) Sonic						
8				157.0	16-36" Moist, dark grey fine to medium SAND and weathered Gneissic Schist, trace round fine Gravel, trace Silt; 36-40" BRICK, slight hydrocarbon odor; 40-48" Moist, dark grey/black fine to medium SAND and GNEISS		
10	10-12' (SS) Spoon	6-6-8-9	6"	80.4	Wet, black GNEISS, trace Wood, slight hydrocarbon odor		
		---	6"	110.0	Wet, black GNEISS, little grey fine to medium SAND, trace Wood, slight hydrocarbon odor		
12	10-15' (SO) Sonic						
14							
	15-17' (SS) Spoon	6-3-3-3	8"	130.0	0-4" Wet, black GNEISS, little grey fine to medium SAND, trace Wood, slight hydrocarbon odor		
16					4-6" CONCRETE; 6-8" Black, medium to coarse SAND and black GNEISS		
		---	14"	2469.0	0-8" CONCRETE and black GNEISSIC SCHIST, some tan Schist medium Gravel, NAPL blebs, strong hydrocarbon odor; 8-14" Brown/black medium SAND and weathered GNEISS, some Concrete, trace Brick, NAPL saturation-blebs, moderate hydrocarbon odor		
18	15-20' (SO) Sonic						
20	20-22' (SS) Spoon	50/0"	<1"	---	White SCHIST in tip of drive shoe		
		---	72"		White SCHIST, multiple horizontal fractures throughout; vertical ~20° fracture from 56-72"		
22							
24	20-29' (SC) Sonic Casing						
26							
28							
					End of Boring at 29 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/26)
5 to 29'= Sampling with sonic rig and split spoon
20 to 29'=Rock Cored utilizing Sonic casing
Boring complete to 29' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-24/MW-21 (Sheet 1 of 1)

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Mike Brody
Inspector: Zohar Lavy
Rig Type: CME-75 Truck Rig

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

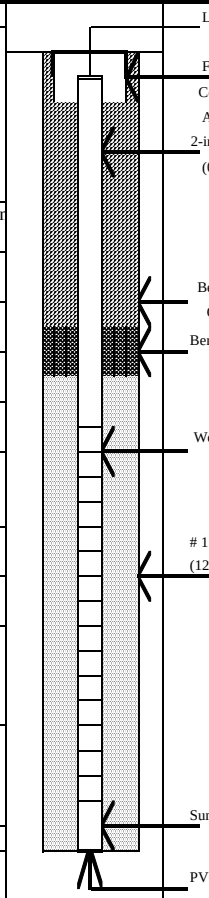
GROUNDWATER OBSERVATIONS				
Water Level	DTW ~3'	DTW 0.95		
Date	3/7/2012	4/10/12		
Time	1500	0800		
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, low 70s
Date/Time Start: 3/14/12 ; 0930
Date/Time Finish: 3/19/12 ; 1030

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL
0	Vac-Tron	Hand-Cleared	---	0.0	0-8" ASPHALT
				0.0	8-36" Moist, dark brown, fine to coarse SAND, some angular to sub-round fine to medium Gravel
2				0.0	
				0.0	36-51" Wet to moist, dark brown, fine to coarse SAND, some angular to sub-round fine to medium Gravel, little Cobble
4				0.0	
				0.0	51-60" Wet, dark brown, fine to coarse SAND, some angular to sub-round fine to medium Gravel, little Cobble
	5-7' (SS) 2" Spoon	10-9-15-8	6"	21.5	0-4" Wet, brown/gray, medium to coarse Sand and fine to coarse angular to sub-rour
6					Gravel; 4-6" WOOD
	7-9' (SS) 2" Spoon	6-8-6-3	2"	5.4	Wet, angular to subangular GRAVEL
8					
	9-11' (SS) 2" Spoon	3-1-5-1	2"	11.6	Wet, angular to subangular GRAVEL, trace brick
10					
	11-13' (SS) 2" Spoon	7-7-6-6	0"	-	No Recovery
12					
	13-15' (SS) 2" Spoon	4-4-1-1	0"	-	No Recovery
14					
	15-17' (SS) 2" Spoon	1-1-7-13	6"	158.0	0-4" Wet, weathered GNEISSIC SCHIST, little tan, fine to medium Sand, NAPL blebs, strong hydrocarbon odor, staining; 4-6" Tan fine to medium SAND, little angular medium to coarse Gravel, trace Wood
16					
	17-19' (SS) 2" Spoon	12-4-1-1	2"	2567.0	Black, fine to medium SAND, some fine angular to sub-angular Gravel, NAPL blebs, strong hydrocarbon odor, staining
18					
	19-21' (SS) 3" Spoon	2-3-5-2	2"	17.7	SCHIST, COBBLE, and WOOD
20					
	21-23' (SS) 3" Spoon	5-2-1-2	12"	3641.0	0-9" Wet, weathered black Gneissic SCHIST and fine to coarse GRAVEL, NAPL blebs, strong hydrocarbon odor
22					9-12" Wet, black fine to medium SAND, some fine to medium sub-angular to sub-round Gravel, NAPL saturation, strong hydrocarbon odor, staining
	23-25' (SS) 3" Spoon	2-1-50/3	10"	3590	0-6" Wet, black fine to medium SAND, some fine to medium sub-angular to sub-round Gravel, NAPL saturation, strong hydrocarbon odor, staining; 6-10" Wet, black, fine to medium SAND and fine to medium angular to sub-round GRAVEL, NAPL saturation, strong hydrocarbon odor, staining
24					
					Pound casing and roller bit to 26 ft bgs
26	26-31' (C) Coring	-	Recovery: 30" RQD: 90%		Cored from 26-31': 0-10" two segments of CONCRETE ; 10-12" one segment of SCHIST ; 12-24" one segment of black GNEISSIC SCHIST w/ Quartz, gray schist vein; 24-42" one segment of black GNEISSIC SCHIST w/ Quartz; 42-45" one segment of black GNEISSIC SCHIST with Quartz.
					26-27' -> 2 minutes
28					27-28' -> 2 minutes
					28-29' -> 10 minutes
30					29-30' -> 10 minutes
	31-36' (C) Coring	-	Recovery: 30" RQD: 90%		Cored from 31-36': 0-60" two segments of black GNEISS, bands of Gneissic Schist
32					31-32' -> 27 minutes
					32-33' -> 8 minutes
34					33-34' -> 11 minutes
					34-35' -> 9 minutes
					35-36' -> 10 minutes
					End of Boring at 36 ft bgs

SCHEMATIC



COMMENTS
Boring was grouted from 36 to 26 ft bgs prior to well install

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2", 3")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/6)
5 to 19'=Interval sampling with split spoon (2"), 19 to 25'=Interval sampling with split spoon (3")
26 to 31' bgs=Rock Cored (6 segments); 31-36'=Rock Cored (2 segments)
Boring complete to 36' bgs; Grouted to surface; install MW-21 to 26 ft bgs (2" well)

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-25 — Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: Truck CME 75 (Drive and Wash)

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Clear, High in the low 50s F, very windy
Date/Time Start: 3/26/12 ; 900
Date/Time Finish: 3/30/12 ; 1300

GROUNDWATER OBSERVATIONS

Water Level	DTW ~4.5' bgs	DTW		
Date	3/7/2012			
Time	1100			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-10" ASPHALT 10-16" Moist, brown fine to coarse SAND and GRAVEL, trace Silt, trace Cobbles, trace Brick 16-54" Moist, dark brown fine to coarse SAND, some fine to coarse Gravel, little Silt, trace Cobbles, trace black, micaceous, Schist fragments, trace concrete Encountered ground water at 4.5' bgs. Dig bar advanced to 60" in several locations		Observed Water Level at 4.5 ft bgs
2							
4							
6	5-7' (SS) Spoon	1-4-6-3	13"	16.0	0-6" Wet, fine to coarse SAND, some fine Gravel 6-13" Wet, brown, SAND and GRAVEL, some black Gneissic Schist, trace Brick		
8	7-9' (SS) Spoon	2-3-3-1	12"	25.8	0-12" Wet, brown/black SAND, some black Gneissic Schist, little Gravel and Brick, slight hydrocarbon odor		
10	9-11' (SS) Spoon	3-5-5-3	0"	-	No Recovery		
12	11-13' (SS) Spoon	2-2-3-4	8"	-	0-8" BRICK and MORTAR and black GNEISSIC SCHIST, little weathered red Concrete		
14	13-15' (SS) Spoon	2-6-33-50/3"	13"	104	0-7" Gray, red, and black, fine to coarse angular to sub-angular medium to coarse SAND, little fine Gravel; 7-10" Red, weathered CONCRETE; 10-13" Wet, gray fine SAND, some Silt, slight hydrocarbon odor		
16	15-17' (SS) Spoon	7-8-13-19	9"	80.1	0-6" Wet, medium to coarse SAND, little fine to coarse angular to sub-angular Gravel, trace black Gneissic Schist, trace Brick 6-9" Gray fine SAND, some fine Gravel, little Silt, trace Wood		
18	17-19' (SS) Spoon	22-17-22-23	21"	99.5	0-9" Wet, brown and red medium to coarse SAND, little fine Gravel, little Brick 9-21" Soft, highly weathered, black, micaceous, GNEISSIC SCHIST, slight hydrocarbon odor		
20	19-25' Roller bit	-	-	-	Roller bit advanced 19 to 25 ft bgs due to obstructions. Roller bit grinds then drops. Returns are black, Gneissic Shist. Possible weathered bedrock. Difficult to advance casing, switched to 3" casing with spin shoe to advance.		
22							
24							
26	25-30' (C) Coring		Recovery: 58/60" RQD: 88%		Cored from 25 to 30': 0-58" Hard, fresh, black, GNEISSIC SCHIST, abundant red quartz. White quartz veins throughout sample with vein dip at 45° 25-26' -> 30 minutes 26-27' -> 21 minutes 27-28' -> 40 minutes 28-29' -> 60 minutes 29-30' -> 19 minutes		
28							
32	30-35' (C) Coring		Recovery: 57/60" RQD: 95%		Cored from 30 to 35': Hard, fresh, black , GNEISSIC SCHIST, rose and white quartz veins 30-31' -> 20 minutes 31-32' -> 30 minutes 32-33' -> 31 minutes 33-34' -> 24 minutes 34-35' -> 50 minutes		
34							
					End of Boring at 35 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON (3")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/7)
5 to 19'=Interval sampling with split spoon (3")
25 to 30', 30 to 35' =Rock Cored
Boring complete to 35' bgs; Grouted to surface (3/30)

Contractor: Advanced Drilling Technology
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-26 Sheet 1 of 1
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~4 ft bgs	DTW		
Date	3/22/2012			
Time	930			
Meas. From	Hand Clearance	Top of Casing		

Weather: Cloudy, mid 50s
Date/Time Start: 4/11/12; 0900
Date/Time Finish: 4/12/12; 1430

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-12" ASPHALT		Observed Water Level at 4 ft bgs
				4.0	12-24" Moist, brown, fine to medium SAND, some medium to coarse Gravel, little Brick		
2				2.7	24-36" Moist, brown, fine to medium SAND, some medium to coarse Gravel and Silt, little Brick, little Cobble		
				1.9	36-48" Moist, brown, fine to medium SAND, some medium to coarse Gravel and Silt, little Brick, little Cobble, slight hydrocarbon odor		
4				1.5	48-60" Brown/green Sand, some Clay and Brick, little Cobble		
					Spun casing to 6 ft bgs		
6	6-8' (SS)Spoon	45-35-25-36	10"	1.9	0-3" Wet, brown SAND and GRAVEL; 3-10" Wet, white highly weathered SCHIST, moderate hydrocarbon odor		
8	8-10' (SS)Spoon	4-11-12-3	5"	172.0	0-2" Wet, white slightly weathered SCHIST, some brown fine to coarse SAND, NAPL saturated, moderate hydrocarbon odor; 2-5" Wet, black, GNEISSIC SCHIST, some grey Clay, NAPL blebs		
10	10-12' (SS) Spoon	1-2-1-1	0	---	No Recovery		
12	12-14' (SS) Spoon	50/2"	2"	---	Hard, white SCHIST (pulverized)		Roller bit refusal at 13 ft bgs and sent core barrel from 13 to 18 ft bgs. Core was not through bedrock. When casing was pulled, artesian conditions were present with NAPL. No further coring was
	13-18' (C)Coring	---	Recovery: 28" RQD: NA		0-28" Fresh, hard, black Gneissic SCHIST, quartz vein at 5"; mechanical fractures at 5", 7", 17", and 21"; 16-18' BRICK and MORTAR and NAPL saturated WOOD		
14					13-14' - > 36 minutes 15.75-16.75' - > 25 minutes		
					14-15' - > 33 minutes 16.75-17.75 - > 92 minutes		
16					15-15.75' - > 25 minutes		
					End of Boring at 18 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (3")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/22)
5 to 13'=Interval sampling with split spoon (3")
13'-18'= Cored through boulder
Boring complete to 18' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Chris Migliori
Inspector: Noah Garguilo, Zohar Lavy
Rig Type: Sonic, CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 1 of 2 **PDI-27**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	4/17/2012			
Time	1150			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, high 70s
Date/Time Start: 4/17/12; 1150
Date/Time Finish: 4/23/12;1430

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	2.7	0-12" ASPHALT		Observed Water Level at 5 ft bgs
				3.9	12-24" Fine to medium SAND, some medium to coarse Gravel and Brick		
2				5.0	24-36" Moist, fine to medium SAND, some Silt and coarse Cobble		
				22.0	36-54" Moist, fine to medium SAND, some Silt and Clay, little Cobble		
4				22.0	54-60"Moist, fine to medium SAND, some Clay, NAPL blebs, hydrocarbon odor, sheen		
	5-7' (SS) Spoon	6-8-5-7	10"	14.3	Wet, dark brown fine to coarse SAND, some angular to sub-round fine to medium Gravel, little weathered Gneissic Schist, trace Brick		
6							
	5-10' (SO) Sonic	---	36"	24.9	Wet, dark brown/grey fine to coarse SAND, some angular to sub-round fine to medium Gravel, little weathered Gneissic Schist, trace Brick		
8							
10	10-12' (SS) Spoon	5-4-5-3	14"	37.1	Wet, dark brown/grey fine to coarse SAND, some angular to sub-round fine to medium Gravel, little weathered Gneissic Schist, trace Silt, trace Brick, NAPL blebs, hydrocarbon odor, staining		
12	10-15' (SO) Sonic	---	60"	65.8	0-12" Wet, dark brown/grey fine to coarse SAND, some angular to sub-round fine to medium Gravel, little weathered Gneissic Schist, little Silt, trace Brick, NAPL blebs, hydrocarbon odor, staining; 12-60" Wet, dark brown/grey fine to coarse SAND, some angular to sub-round fine to medium Gravel, little weathered Gneissic Schist, little Silt, trace Brick, trace Wood, NAPL blebs, hydrocarbon odor, staining		
				73.8			
14							
	15-17' (SS) Spoon	2-1-1-3	24"	27.8	Wet, brown/grey fine to medium SAND, little angular to sub-angular fine to coarse Gravel, little Silt, slight hydrocarbon odor, sheen		
16							
	15-20' (SO) Sonic	---	0"	---	No Recovery		
18							
20	20-22' (SS) Spoon	1/12"-1/12"	5"	25.6	0-3" Wet, fine to medium sub-angular to sub-round GRAVEL; 3-5" Wet, brown fine to medium SAND and fine sub-angular GRAVEL, trace Silt		
22	20-25' (SO) Sonic	---	20"	31.8	Wet, brown fine to medium SAND and fine sub-angular GRAVEL, trace Silt		
24							
					Added 7" casing and it slipped to 27 ft bgs. Added an additional section of 7" casing to 30 ft bgs		
26							
28							
30	30-32' (SS) Spoon	6-12-10-14	14"	156	0-12" Wet, brown fine to coarse SAND, little Brick, little fine to medium sub-angular Gravel, trace Wood, trace Silt, hydrocarbon odor; 12-14" BRICK		
32	30-35' (SO)	---	32"	731	0-12" Wet, brown fine to coarse SAND, little Brick, little fine to medium sub-angular Gravel, trace Wood, trace Silt, hydrocarbon odor; 12-32" Wet, brown/black fine to coarse SAND, some fine to coarse sub-angular to sub-round Gravel, little Brick, trace Silt, striated zones of NAPL blebs-saturation, hydrocarbon odor, staining		
34							
	35-35.5' (SS) Spoon	12-50/1"	6"	72.1	0-2" Wet, brown/grey fine SAND, trace Brick, hydrocarbon odor, sheen; 2-6" BRICK		
	35-37' (SO) Sonic	---	24"	291	0-12" Wet, brown/grey fine to coarse SAND, little sub-angular to sub-round fine to medium Gravel, hydrocarbon odor, sheen; 12-20" BRICK; 20-24" White/grey		
36							

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/22)
5 to 37'=Interval sampling with split spoon and sonic
37'-42'= Rock Cored
Boring complete to 42' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Chris Migliori
Inspector: Noah Garguilo, Zohar Lavy
Rig Type: Sonic, CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-27 Sheet 2 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	4/17/2012			
Time	1150			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, high 70s
Date/Time Start: 4/17/12; 1150
Date/Time Finish: 4/23/12;1430

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
37	37-42' (C) Coring	---	Recovery: 58" RQD: 0%		Cored from 37 to 42': 0-58": Hard, white SCHIST; vertical fracturing throughout sample, red and green weathering along vertical fractures, little horizontal fractures		
					37-38' - > 113 minutes 40-41' - > 53 minutes		
39					38-39' - > 150 minutes 41-42' - > 112 minutes		
					39-40' - > 47 minutes		
41							
					End of boring at 42 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/22)
5 to 37'=Interval sampling with split spoon and sonic
37'-42'= Rock Cored
Boring complete to 42' bgs ; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-28 (Sheet 1 of 1)

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/19/2012			
Time	1250			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, Up to 70F, Wind: 5-10 mph S
Date/Time Start: 4/19/12; 1250
Date/Time Finish: 4/24/12; 1500

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT		
				0.0	8-24" Brown fine to coarse SAND, some Silt, some medium to coarse Gravel, and Brick		
2				0.0	24-60" COBBLE and BRICK, trace Metal (at 2.5')		
4							Observed Water Level at 5 ft bgs
	5-7' (SS) Spoon	3-6-52/5"	10"	18.8	Wet, brown/black fine to coarse SAND and black micaceous GNEISS		
6							
	5-7' (SO) Sonic	-	24"	18.8	Wet, brown/black fine to coarse SAND and black micaceous GNEISS		
8					Sonic sampler refusal at 7 ft bgs, 5" casing down to 10.0' bgs. Rock encountered from 8 to 10' bgs.		
	9-14' (C) Coring	---	Recovery: 60" RQD: 100%	---	Cored from 9 to 14': 0-60": Hard, white SHIST; weathered horizontal fracture with red/rust staining at 16"		
10							
12					9-10' - > 17 minutes 12-13' - > 21 minutes		
					10-11' - > 13 mintues 13-14' - > 20 minutes		
					11-12' - > 15 minutes		
14	14-19' (C) Coring	---	Recovery: 47" RQD: 62%	---	Cored from 14 to 19': 0-47" Hard, fresh white SCHIST; horizontal fractures at 5", 7" and 25"; abundant mechanical breaks; no vein dip apparent.		
16					14-15' - > 20 minutes 17-18' - > 17 minutes		
					15-16' - > 12 minutes 18-19' - > 15 minutes		
					16-17' - > 25 minutes		
					End of boring at 19 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/21)
5 to 9'=Interval sampling with and sonic rig
9 to 19'=Rock Cored
Boring complete to 19' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-29 Sheet 1 of 2

Contractor: Advanced Drilling Technology
Driller: Jeremy Meyers, Chris Migliori
Inspector: Noah Garguilo, Zohar Lavy
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS

Water Level	DTW 2.5 ft bgs	DTW		
Date	6/5/2012			
Time	1130			
Meas. From	Hand Clearance	Top of Casing		

Weather: Clear, 60-70s
Date/Time Start: 6-6-12, 1200
Date/Time Finish: 7-5-12, 1500

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-10" ASPHALT		
				0.0	10-60" Moist , brown fine to coarse SAND and GRAVEL, some Brick and Gneissic SCHIST Cobble		
2							
					Encountered ground water at 30" bgs. Dig bar advanced to 60" in several locations		Observed Water Level at 2.5 ft bgs
4							
	5-10' (SO) Sonic	---	36"	27.0	0-24" Moist, brown, GRAVEL, some Sand, Brick, and Debris		
6							
				58.1	24-36" Black/brown, fine to coarse SAND, some weathered Gneissic SCHIST, moderate hydrocarbon odor		
8							
10	10-13' (SO) Sonic	---	24"	151	0-24" Black, weathered, GNEISSIC SCHIST, moderate hydrocarbon odor		
12							
	13-15' (SO) Sonic	---	12"	---	CONCRETE		
14							
	15-16' (SO) Sonic	---	6"	0.2	0-6" Moist, brown, SAND and GRAVEL		
16	16-20' (SO) Sonic	---	6"	---	CONCRETE		
18							
20	20-24' (SO) Sonic		24"	0.0	CONCRETE		
22							
24	24-27' (SO) Sonic		20"		0-8" Black, GNEISSIC SCHIST		
				1019	8-12" Grey, fine SAND, some Gravel, little Silt, moderate hydrocarbon odor		
26					12-20" Black GNEISSIC SCHIST		
	27-29' (SO) Sonic		0	---	No recovery. NAPL in wash water at 27'		
28							
	29-31' (SO) Sonic		24"	1020	Moist, brown, SAND and SILT, little Gravel, little Gneissic Schist Cobbles,		
30					moderate hydrocarbon odor, NAPL blebs		
	31-35' (SO) Sonic		36"	0.0	Moist, black, weathered GNEISSIC SCHIST		
32							
34							
	35-39' (SO) Sonic		48"	0.0	Black, hard, fresh, GNEISSIC SCHIST, vertically folded (+80° to -80°), some white SCHIST		
36							
38							

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/5)
5 to 40'=Interval sampling with and sonic rig
38 to 44'=Rock Cored.
Boring complete to 44' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Jeremy Meyers, Chris Migliori
Inspector: Noah Garguilo, Zohar Lavy
Rig Type: Sonic, CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 2 of 2 **PDI-29**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW 2.5 ft bgs	DTW		
Date	6/5/2012			
Time	1130			
Meas. From	Hand Clearanc	Top of Casing		

Weather: Clear, 60-70s
Date/Time Start: 6-6-12, 1200
Date/Time Finish: 7-5-12, 1500

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
38	38-44' (C) Coring	---	Recovery: 38" RQD: 41%	---	Cored from 38 to 44': 0-24" Hard, white SCHIST; weathered horizontal fracture at 4"; 45° fracture at 8"; 24-38" Black, GNEISSIC SCHIST, vertical banding and dips, weathered horizontal fractures at 27" and 35".		Coring began at 38 ft bgs through weathered rock which was pulled up by the sonic.
					38-39' - > 20 minutes 41-42' - > 17 minutes 39-40' - > 20 minutes 42-43' - > 12 minutes 40-41' - > 16 minutes 43-44' - > 13 minutes		
					End of Boring at 44 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/5)
5 to 39'=Interval sampling with and sonic rig
38 to 44'=Rock Cored.
Boring complete to 44' bgs; Grouted to surface

Contractor: Aquifer Drilling & Testing Inc.
Driller: Chris Migliori, Frank Quinn
Inspector: Noah Garguilo
Rig Type: Truck CME 75 (Drive and Wash)

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 1 of 1 **PDI-30**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW 39" bgs	DTW		
Date	3/16/2012			
Time	900			
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, 40s to 50s
Date/Time Start: 4/9/12; 900
Date/Time Finish: 4/19/12; 1024

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-39" ASPHALT ; 10-20" Dry, very dense, brown fine to coarse SAND, some Gravel, trace Cobbles, trace Silt; Solid iron bar in the hole at 16"		Observed Water Level at 3.25 ft bgs
2					Encountered ground water at 39" bgs. Dig bar advanced to 60" in several locations.		
4				0.0			
6	5-7' (SS) 3" Spoon	11-10-12-9	10"	13.4	0-10" Wet, highly weathered, black, GNEISSIC SCHIST, some brown fine to medium Sand, white cement-like material in drive shoe		
8	7-9' (SS) 3" Spoon	8-14-8-8	12"	10.4	0-8" Wet, black, medium to coarse SAND and fine GRAVEL, little black Gneissic SCHIST 8-10" White, fresh, hard CONCRETE 10-12" White, highly weathered CONCRETE, trace Brick and Gneissic SCHIST		
	Not Sampled				9 to 10' not sampled, see notes		
10	10-12' (SS) 2" Spoon	11-7-8-8	8"	8.4	0-6" Wet, black fine to medium SAND and black weathered Gneissic SCHIST 6-8" White, hard CONCRETE, black NAPL saturation, slight hydrocarbon odor		
12	12-14' (SS) 2" Spoon	3-5-5-4	6"	22.5	0-3" WOOD 3-6" Wet, light brown, fine to coarse SAND		
14	14-16' (SS) 2" Spoon	17-5-6-7	12"	5.9	0-12" Wet, weathered, black, GNEISSIC SCHIST, some Brick		
16	16-18' (SS) 2" Spoon	14-11-8-9	8"	4.0	0-8" Wet, weathered, black, GNEISSIC SCHIST, some Brick		
18	18-20' (SS) 2" Spoon	8-10-17-15	18"	8	0-9" Wet, weathered SCHIST, some Brick 9-18" Wood, some black GNEISSIC SCHIST, NAPL coating, NAPL saturation-blebs		
20	20-22' (SS) 2" Spoon	3-5-3-7	0"		No Recovery		
22	22-24' (SS) 2" Spoon	6-4-10-16	6"		0-6" Hard, fresh, white, QUARTZ		
24	24-26' (SS) 2" Spoon	15-45-50/1"	2"	13.8	0-2" Wet, SCHIST, trace brick		
26	25-27' (SO) Sonic	-	24"	13.8	0-12" Wet, SCHIST, some fine to coarse Gravel, trace brick, trace Wood; 12-24" Gray, fine to coarse SAND and weathered SCHIST, some fine to coarse angular to subround Gravel, trace Silt		
28	25-30' (SO) Sonic, 5" Casing	-			White-gray SCHIST		
30	31-35'-10" (C) Coring	-	Recovery: 32" RQD: 10/32"	-	Cored from 31 to 35'-10": 0-58" White, hard, SCHIST, existing fractures horizontally at 6", 11", 16", and 36". Open vertical fractures at 2 to 16" and 28 to 36". Closed vertical fractures 26 to 58". Mechanical fractures (drilling breaks) at 24" and 27". Existing fractures contain black weathering, possibly very weathered NAPL staining or possible weathering of base material. Discoloration extends ~0.25" into material. No odor to 36", then slight below 36". Open vertical fracture closes at 36", no black staining below 36". Rock has light rust weathering in areas throughout. NAPL present on core barrel exterior. 31-32' -> 20 minutes 32-33' -> 47 minutes 33-34' -> 74 minutes 34-35' ->119 minutes		
36					End of Boring at 35.8 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (3", 2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/8) ;
5 to 9'=Interval sampling with (3") split spoon, 10 to 26' with (2") split spoon, 25 to 30' with sonic rig.
9 to 10' interval not sampled due to switch from 4" case to 3" case, needed to seat 3" case 1 foot to maintain seal.
31 to 35'-10" =Rock Cored ; Boring completed to 35.8 ft bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-31 — Sheet 1 of 1

Contractor Advanced Drilling Technology
Driller: Chris Migliori, Chris Stratton
Inspector: Zohar Lavy
Rig Type: CME-75(Track), Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Weather: Clear, 30s - 50s
Date/Time Start: 3/27/1 ; 0935
Date/Time Finish: 3/27/12; 1235

Location Plan
See Site Plan

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	3/27/2012			
Time	0935			
Meas. From	Sonic Sample	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" Wire mesh reinforced CONCRETE 8-24" Moist, dark brown, fine to coarse SAND, some Gravel, trace Silt, trace Cobble 17-23" Moist, dark brown, fine to coarse SAND, some Gravel, trace Silt, trace Cobble; light brown SILT visible in the west side wall 24-60" Moist, dark brown, fine to coarse SAND, some Gravel, trace Silt, trace boulder		Observed Water Level at 5 ft bgs
2							
4							
	5-10' (SO) Sonic,	-	60"	6.5	0-30" Wet, brown fine to coarse SAND, some Cobble; 30-60" Wet, gray/brown fine SAND and weathered BRICK, some Silt, gneissic schist, little medium to coarse angular-subangular gravel		
6							
8		-					
10	10-12' (SS) Spoon	50/1"	1"	---	Black GNEISSIC SCHIST		
	10-15' (SO) Sonic	-	18"	14.7	Moist, highly weathered black GNEISSIC SCHIST and fine to coarse SAND; Drove casing to 15 ft bgs. NAPL washing into mud tub during casing advancement		
12							
14							
	15-15.5' (SS) Spoon	50/6"	6"	25.6	Fluff (gneiss, weathered rock, slight hydrocarbon) odor		
16	15-20' (C) Coring	-	Recovery: 56" RQD: 77%	---	Cored from 15-20': 0-6" Coarse GNEISSIC SCHIST GRAVEL; 6-56" Hard, black GNEISSIC SCHIST, abundant vein dip and folding throughout, horizontal fractures at 9", 17", 24", 36"-40"; 45° fracture at 44" and 54" 15-16' -> 10 Minutes 16-17' -> 20 Minutes 17-18' -> 15 Minutes 18-19' -> 10 Minutes 19-20' -> 10 Minutes		
18							
20					End of Boring at 20 ft bgs		

SAMPLING METHOD
SO = SONIC
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/9)
5 to 15.5'=Interval sampling with split spoon and sonic rig
15 to 20'=Rock Cored
Boring complete to 20' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PDI-32 Sheet 1 of 1
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	3/28/2012			
Time	930			
Meas. From	Split Spoon	Top of Casing		

Weather: Partly Cloudy, Up to high 60's
Date/Time Start: 3/28/12 ; 0930
Date/Time Finish: 3/28/12 ; 1320

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	0	0-8" CONCRETE		Observed Water Level at 5 ft bgs
				0.0	8"-3' Moist, brown fine to coarse SAND, some Cobble and Gravel, little Concrete debris		
2				0.0	3-5' Moist, brown fine to coarse SAND, some Cobble, little Concrete debris, trace Wood		
4							
	5-7' (SS) Spoon	3-5-7-9	14"	1.8	Wet, brown, fine to medium SAND, little fine to medium angular-sub-angular Gravel		
6							
	5-10' (SO) Sonic	-	50"	1.9	0-20" Wet, brown, fine to medium SAND, little fine to medium angular-sub-angular Gravel		
8					20-40" Wet, dark brown/orange, medium SAND, little angular-sub-angular medium to coarse gravel, trace Silt		
					40-50" Wet, brown/red fine to coarse SAND, little fine to coarse subangular-round gravel, trace Silt		
10	10-12' (SS) Spoon	7-8-9-9	12"	3.5	0-10" Wet, brown, medium to coarse SAND, little medium to coarse sub-angular-round Gravel, trace Silt		
					10-12" Wet, dark brown, medium to coarse SAND, little medium to coarse sub-angular-round Gravel, trace Silt		
12	10-15' (SO) Sonic	-	48"	4.6	0-20" Wet, brown/red medium to coarse SAND, little sub-angular-round fine to coarse Gravel		
					20-48" Dark brown/black, medium to coarse SAND, trace round fine to coarse Gravel, trace black Gneissic Schist		
14							
	15-15.25' (SS) Spoon	50/3"	3"	8.2	0-3" Black GNEISSIC SCHIST		
16	15-20' (C) Coring	-	Recovery: 60" RQD: 86%	---	Cored from 15 to 20': 0-36" Black GNEISS; 36-60" Black GNEISSIC SCHIST; abundant vein dip and folding throughout; 45° fractures at 1", 8", 18", 24", 34", 42", 52", and 58"		
18					15-16' -> 8 Minutes		
					16-17' -> 11 Minutes		
					17-18' -> 9 Minutes		
					18-19' -> 7 Minutes		
					19-20' -> 8 Minutes		
20					End of Boring at 20 ft bgs		

SAMPLING METHOD
SO = SONIC
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5' = Hand-Clearance (3/9)
5 to 15' = Interval sampling with split spoon and sonic rig
15 to 20'=Rock Cored
Boring complete to 20' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-33 — Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Mike Brody
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Cloudy, up to 70F
Date/Time Start: 3/21/12 ; 1335
Date/Time Finish: 3/26/12 ; 1100

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~4 ft bgs	DTW		
Date	3/9/2012			
Time	1335			
Meas. From	Hand Clearance	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	---	0-8" CONCRETE; 8"-48" Moist, brown fine to coarse SAND, some Gravel, Cobble, and Concrete debris, trace Brick, trace Wood; 48-60" Wet, brown fine to coarse SAND, some sub-angular to sub-round Gravel, trace Silt		
2							
4							Observed Water Level at 4 ft bgs
	5-7' (SS) Spoon	10-12-14-27	14"	46.0	0-6" Wet, brown fine to coarse SAND, some angular to subangular medium to coarse Gravel; 6-10" BRICK		
6					10-14" Highly weathered black GNEISSIC SCHIST		
	5-10' (SO) Sonic	All Fluff	30"	4.5	0-20" Wet, brown-gray fine to coarse SAND, some angular medium Gravel		
8					20-25" BRICK		
					25-30" Wet, highly weathered black GNEISSIC SCHIST, slight hydrocarbon odor		
10	10-12' (SS) Spoon	12-6-6-6	10"	642	0-8" Wet, highly weathered black GNEISSIC SCHIST, NAPL saturation, very fluid, staining, strong hydrocarbon odor		
					8-10" Wet, gray fine Sand and SILT, NAPL saturation, strong hydrocarbon odor, staining		
12	10 - 15' (SO) Sonic	-	0"		No Recovery		
14							
	15-17' (SS) Spoon	5-6-12-50/2"	8"	571.0	0-8" Wet, brown/gray fine to coarse SAND and highly weathered black GNEISSIC SCHIST, trace Wood, NAPL blebs, sheens, strong hydrocarbon odor		
16							
	15-20' (SO) Sonic	-	24"	254.0	0-12" Wet, brown/gray fine to coarse SAND and highly weathered black GNEISSIC SCHIST, trace Wood, NAPL blebs, sheens, strong hydrocarbon odor; 12-20"		
18					20-24" Wet, gray fine to medium SAND, little Silt, little fine to medium sub-angular to angular Gravel, trace Cobble, NAPL blebs, staining, strong hydrocarbon odor		
20	20-22' (SS) Spoon	7-7-9-10	8"	415	0-7" Wet, dark brown medium to coarse SAND, some weathered black Gneissic Schist		
					7-8" Gray SCHIST		
22	20-25' (SO) Sonic	-	8"	78	Wet, black weathered GNEISSIC SCHIST, some Concrete, trace Brick, strong hydrocarbon odor, sheen		
24							
	25-27' (SS) Spoon	50/5"	4"	14.7	Wet, black GNEISSIC SCHIST and gray SCHIST		
26							
	25-30' (SO) Sonic	-	24"		0-12" Wet, black GNEISSIC SCHIST and gray SCHIST		
28					12-24" Degraded mix of CONCRETE, some black weathered Gneissic Schist, little Cobble, trace Wood, trace Brick		
30	30-35' (C) Coring	-	Recovery: 60" RQD: ~75%		Casing set to 30'; Cored from 30 to 35': 0-18" Light tan SCHIST with dark gray band; 18-24" SCHIST abundant mechanical breaks; 24-26" GNEISS; 26-60" Light gray/tan SCHIST, some rose quartz garnets, trace gneiss; horizontal fractures at 12", 19", 21", 41", 44", and 55"; 30° fracture at 48"		
					30-31.5' - >15 minutes		
32					31.5-33' - > 43 minutes		
					33-34' - > 40 minutes		
34					34-35' - > 42 minutes		
					End of Boring at 35 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (3/9)
5 to 30'=Interval sampling with split spoon and sonic rig
30 to 35'=Rock Coring (15 segments)
Boring complete to 35' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. PDI-34 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Stratton, Chris Migliori
Inspector: Zohar Lavy
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/13/2012			
Time	945			
Meas. From	Split Spoon	Top of Casing		

Weather: Cloudy, up to 70F
Date/Time Start: 4/13/12 ; 0945
Date/Time Finish: 4/17/12 ; 0959

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" CONCRETE; 8"-48" Moist, brown fine to coarse SAND, some Gravel, Cobble, and Concrete debris, trace Brick, 48-60" Moist, brown fine to coarse SAND, some sub-angular to sub-round Gravel, little Cobble		
2							
4							
	5-7' (SS) Spoon	6-12-50/3"	8"	6.7	0-6" Wet, brown medium to coarse SAND, little angular medium Gravel 6-8" Wet, brown coarse SAND and light tan weathered SCHIST		Observed Water Level at 5 ft bgs
6	5-7' (SO) Sonic	-	24"	7.2	0-12" Wet, brown medium to coarse SAND, little medium to coarse angular Gravel, trace Silt, trace Brick; 12-20" Brown fine to coarse SAND, little angular to sub-angular fine to coarse Gravel, trace Silt, trace Schist; 20-24" Weathered SCHIST		
8	7-11' (SC) Sonic Casing				Sonic sampler refusal at 7 ft bgs. Pushed casing from 7 to 11 ft bgs through highly resistant rock 7-11' Grey, fresh, hard SCHIST		
10							
12	11-16' (C) Coring		Recovery: 56" RQD: 36"	---	Cored from 11-16': White, hard SCHIST. Fresh to 13', then slightly weathered with numerous existing fractures to 16'. Some areas of white to rose quartz. Consists of pieces generally 2-4" in length. Some 0.5-1" pieces. Light rust staining in many areas. Some mechanical breaks, but mostly existing fractures. 11-12' -> 20 minutes 12-13' -> 25 minutes 13-14' -> 82 minutes 14-15' -> 70 minutes 15-16' -> 13 minutes		
14							
16	16-23' (C) Coring		Recovery: 24" RQD: NA	---	Cored from 16 to 23': White, hard SCHIST. Light rust staining in many areas. Some mechanical breaks, but mostly existing fractures. Core ran quickly from 16 to 21, and rock core likely not recovered in that interval. Return contains highly weathered rock flour. Stopped core due to loss of seal at surface and excessive water loss. 16-17' -> 2 minutes 17-18' -> 1 minute 18-19' -> 1 minute 19-20' -> 1 minute 20-21' -> 1 minute 21-22' -> 39 minutes 22-23' -> 35 minutes		
18							
20							
22							
					End of Boring at 23 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON (2")
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance
5 to 11'=Interval sampling with split spoon and sonic rig
11 to 16', 16 to 21', and 21 to 23'=Rock Cored
Boring complete to 23' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. CONT-1 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Zohar Lavy
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	4/25/2012			
Time	915			
Meas. From	Sonic Sample	Top of Casing		

Weather: Clear, Mid 60s
Date/Time Start: 4/25/12 ; 0915
Date/Time Finish: 5/2/12 ; 1230

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT 8-60" Brown SAND and GRAVEL, some Brick, Wire, Metal		Observed Water Level at 5 ft bgs
2							
4							
	5-10' (SO) Sonic	-	60"	2.8	0-18" Wet, brown/gray, fine to coarse SAND and fine to coarse sub-angular to round GRAVEL, trace Silt, trace Brick, trace Wood;18-24" Moist, gray/black, fine to medium SAND, little Silt, trace fine to medium sub-angular to sub-round Gravel		
6							
				3.1			
8					24-60" Moist, brown/gray, fine to medium SAND, little Silt, trace Wood, trace Brick, trace weathered Gneiss, trace round Cobble		
				1.7			
10	10-15' (SO) Sonic	-	18"	11.2	Wet, weathered GNEISSIC SCHIST, some Brick, little brown, fine to coarse Sand		
12							
14							
	15-20' (SO) Sonic	-	36"	140.0	0-24" CONCRETE		
16					24-36" CONCRETE and BRICK, little Wood		
18							
20	20-25' (SO) Sonic	-	20"	7.8	Moist, red, fine to coarse SAND, trace Silt, trace sub-angular to round, fine to medium Gravel, trace weathered Gneiss		
22							
24							
	25-30' (SO) Sonic	-	60"	12.1	0-18" Moist, red, fine to coarse SAND, trace Silt, trace sub-angular to round, fine to medium Gravel, trace weathered Gneiss		
26					18-60" Weathered GNEISS		
28							
30	30-35' (SO) Sonic	-	42"	1.5	0-42" GNEISSIC SCHIST		
32	31.5-36.5' (C) Coring		Recovery: 54" RQD: 90%		Cored with truck rig, appears casing deviated when installed, causing core to start at 31.5 ft bgs in fresh rock. Rechecked core depth in field. Cored from 31.5-36.5 ft bgs: 0-2" Hard, fresh, black GNEISSIC SCHIST; 2-8" Hard fresh white SCHIST; 8-42" Hard, fresh, black GNEISSIC SCHIST; 42-53" Hard fresh white SCHIST; 53-54" very hard white to rose QUARTZ; transitions are intact and continuous; 35-45° fractures at 10", 31", and 38". 31.5-32.5' - > 20 minutes 34.5-35.5' - > 18 minutes 32.5-33.5' - > 10 minutes 35.5-36.5' - > 20 minutes 33.5-34.5' - > 11 minutes		
34							
36							
					End of Boring at 36.5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance
5 to11'=Interval sampling with sonic rig
31.5-36.5'= Rock Coring
Boring complete to 36.5' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Jankins, C. Migliori.
Inspector: Z. Lavy, S. Monte, N. Garguilo
Rig Type: Sonic / CME 75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. Sheet 1 of 1 **CONT-2**
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~2 ft bgs	DTW		
Date	4/27/2012			
Time	800			
Meas. From	Hand Clearance	Top of Casing		

Weather: 60s, Rain.
Date/Time Start: 5/4/12, 13:00
Date/Time Finish: 5/11/12, 9:00

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---	---	0-8" ASPHALT 8-24" Brown, fine to coarse SAND and COBBLE Encountered ground water at 24" bgs. Dig bar advanced to 60" in several locations.		Observed Water Level at 2 ft bgs
2							
4							
	5-10' (SO) Sonic	---	24"	1.9	0-24" Moist, grey/brown, fine to medium SAND, some weathered Gneissic Schist, little Brick, little sub-angular to sub-rounded fine to coarse Gravel, trace black fine Sand, trace Silt, trace Concrete		
6							
8							
10	10-15' (SO) Sonic	---	52"	14.6	0-24" CONCRETE mixed with Schist and Gneiss		
12				9.6	24-52" Orange/brown, fine SAND and SILT, trace Clay		
14							
	15-20' (SO) Sonic	---	60"	15.3	0-36" Moist, brown, medium to coarse SAND		
16							
18				5.5	36-60" Moist, brown SILT, trace Cobble (weathered schist), slight hydrocarbon		
20	20-25' (SO) Sonic	---	60"	---	0-18" Moist, red/brown, fine SAND, some Silt, trace Cobbles, trace black weathered Gneissic Schist. 18-30" Moist, black, weathered GNEISSIC SCHIST 30-60" Dry, red/brown SAND, some Silt and Gravel, weathered Rock 48-60"		
22							
24							
	25-30' (SO) Sonic	---	36"	0.0	0-8" Weathered SCHIST and COBBLE 8-36" Black, GNEISSIC SCHIST		
26							
28							
30	30-35' (SO) Sonic	---	60"	---	0-60" Black, weathered GNEISSIC SCHIST, highly fractured		
32							
34							
36	35-40' (C) Coring	---	Recovery: 60" RQD: 100%	---	Cored from 35-40': 0-14" Hard, black, fresh GNEISSIC SCHIST. 14-16": Black, GNEISSIC SCHIST transitions to white SCHIST (intact contact). 16-60': Hard, white, fresh SCHIST. Notes: No fractures in core. 0-16" is folded with vein dip from 45° to 135°, varies rapidly. 35-36' -> 26 minutes 36-37' -> 10 minutes 37-38' -> 16 minutes 38-39' -> 19 minutes 39-40' -> 19 minutes		
38							
					End of Boring at 40 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (4/25)
5 to 35'=Sonic rig (5/4, 5/7)
35 to 40'=Rock Cored (1 segment, 5/11)
Boring complete to 40' bgs; Grouted to surface

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic, CME-75

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. CONT-3 Sheet 1 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	5/2/2012			
Time	845			
Meas. From	Sonic Sampler	Top of Casing		

Weather: Cloudy. Light rain, mid 50s
Date/Time Start: 5/2/12; 0845
Date/Time Finish: 5/3/12; 1330

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-9" ASPHALT 9-18" Moist, brown SILT and GRAVEL, some Brick fragments 18-60" Moist, brown SILT and fine SAND, some Cobble		
2							
4							
	5-10' (SO) SONIC	---	60"	12.3	0-30" Wet, brown fine to coarse SAND, some angular to sub-round fine to coarse Gravel		Observed Water Level at 5 ft bgs
6					30-36" Wet, red/brown fine to coarse SAND, some angular to sub-round fine to coarse Gravel		
				29.7	36-44" Highly weathered, black, micaceous GNEISS		
8					44-60" Moist, brown fine to medium SAND, little sub-angular to round fine to coarse Gravel, trace Brick, trace Silt		
10	10-15' (SO) Sonic	---	40"	18.0	0-15" Wet, grey/brown fine to coarse SAND, some fine to medium sub-angular to sub-round Gravel, trace Brick		
12					15-40" Highly weathered GNEISSIC SCHIST		
14							
	15-20' (SO) Sonic	---	24"	82.9	0-6" Highly weathered GNEISSIC SCHIST		
16					6-24" Wet, grey/orange fine to medium SAND, some angular to sub-round fine to coarse Gravel, little weathered Gneissic Schist, trace Brick, NAPL blebs, hydrocarbon odor, sheens		
18							
20	20-22' (SO) Sonic	---	18"	171.0	0-8" Wet, grey/brown fine to medium SAND, some weathered Gneissic Schist, little sub-angular fine to coarse Gravel; 8-18" SCHIST and weathered CONCRETE		
22	22-25' (SO) Sonic	---	30"	15.7	CONCRETE (mixed heavily with black Gneissic Schist and tan Schist Cobble)		
24							
	25-30' (SO) Sonic	---	8"	---	White SCHIST and BRICK		
26							
28							
30	30-35' (SO) Sonic	---	18"	---	0-2" BRICK; 2-18" GNEISSIC SCHIST		
32							
34							
	35-38' (SO) Sonic	---	14"	---	Grey SCHIST		
36							

Please see Sheet 2

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (4/25)
5 to 38'=Interval sampling with sonic rig
38.5-45.5'=Rock Cored
Boring complete to 45.5' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. CONT-3 Sheet 2 of 2

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Migliori
Inspector: Zohar Lavy, Noah Garguilo
Rig Type: Sonic, CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	5/2/2012			
Time	845			
Meas. From	Sonic Sampler	Top of Casing		

Weather: Cloudy. Light rain, mid 50s

Date/Time Start: 5/2/12; 0845

Date/Time Finish: 5/3/12; 1330

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
38	38.5-43.5'(C) Coring	---	Recovery: 50" RQD: 70%	---	Cored from 38.5-43.5': 0-31" Fresh, hard, white SCHIST with intact transition to black Gneissic Schist; 31-50" Fresh, hard, black Gneissic Schist; mechanical fractures at 4", 17", 31", and 42-50"; existing fractures at 35" and 42-50"; 45° vein 38.5-39.5' - > 17 minutes 41.5-42.5' - > 20 minutes 39.5-40.5' - > 28 minutes 42.5-43.5' - > 18 minutes 40.5-41.5' - > 36 minutes		
40							
42							
44	43.5-45.5' (C) Coring	---	Recovery: 6" RQD: NA	---	Cored from 43.5-45.5': 0-6" Vertically split/fracture between white SCHIST and black GNEISSIC SCHIST fragments 43.5-44.5' - > 10 minutes 44.5-45.5' - > 8 minutes		
					End of Boring at 45.5 ft bgs		

SAMPLING METHOD

SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (4/25)
5 to 38'=Interval sampling with sonic rig
38.5'-45.5'=Rock Cored
Boring complete to 45.5' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. CONT-4 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Migliori, Kensley Noran
Inspector: Noah Garguilo
Rig Type: CME-75

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Weather: Cloudy, high 60s
Date/Time Start: 5/7/12; 1200
Date/Time Finish: 5/8/12; 1430

Location Plan
See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	DTW ~5'	DTW		
Date	5/7/2012			
Time	1200			
Meas. From	Casing Advancement	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-6" CONCRETE		Observed Water Level at 5 ft bgs
				0.0	6-60" Moist, brown, fine to coarse SAND and weathered GNEISSIC SCHIST BOULDERS, some Brick and fine to coarse sub-angular to round Gravel, trace Metal		
2							
4					Drove casing to 8 ft bgs due to leaking mud tub; NAPL observed in wash water		
6							
8	8-13' (C) Coring	---	Recovery: 54" RQD: 82%	---	Cored from 8-13': 0-54" Hard, fresh, white SCHIST, abundant rose Quartz to 20"; existing fractures at 12" and 26" are horizontal, fresh to slightly weathered, and NAPL stained; mechanical breaks at 20", 36", 39", and 42"		
10					8-9' - > 14 minutes 11-12' - > 27 minutes		
12					9-10' - > 21 minutes 12-13' - > 20 minutes		
14	13-16.7' (C) Coring	---	Recovery: 48" RQD: 100%	---	10-11' - > 22 minutes		
16					Cored from 13-16.7': 0-48" Hard, white SCHIST, abundant rose Quartz, no fractures or vein dip apparent		
					13-14' - > 36 minutes 15-16.7' - > 61 minutes		
					14-15' - > 54 minutes		
					End of Boring at 16.7 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (4/26)
5 to 8'=Not sampled due to drilling difficulties
8 to 16.7'=Rock Cored
Boring complete to 16.7' bgs ; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. CONT-5 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Chris Mason, Chris Jenkins
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Location Plan

See Site Plan

Weather: Cloudy, high 70s
Date/Time Start: 5/4/12; 0730
Date/Time Finish: 5/4/12; 1000

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5 ft bgs	DTW		
Date	5/4/2012			
Time	820			
Meas. From	Sonic Sampler	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT 8-60" Moist, brown, fine to coarse SAND, some Cobble and Brick, little fine to coarse sub-angular to round Gravel, trace Wood		Observed Water Level at 5 ft bgs
2							
4							
	5-10' (SO) Sonic	---	30"	142.0	0-12" Wet, brown fine to coarse SAND and fine to medium sub-angular to round GRAVEL		
6					12-26" Moist, weathered, black GNEISSIC SCHIST and brown fine to medium SAND, little blue/green fine SAND, hydrocarbon odor		
8					26-30" Moist, weathered, black GNEISSIC SCHIST and brown fine to medium SAND, little blue/green fine SAND, trace Brick, hydrocarbon odor		
10	10-15' (SO) Sonic	---	60"	92.4	0-24" CONCRETE and GNEISSIC SCHIST, trace Wood 24-56" Moist, dark brown fine to coarse SAND, some angular to sub-round fine to medium Gravel, trace Wood, trace Silt		
12				138.0			
14					56-60" Highly weathered, black GNEISS		
					Drilled to 16 ft bgs with Sonic		
16	16-20' (SO) Sonic	---	38"	---	GNEISS to GNEISSIC SCHIST; Dark brown/black NAPL in wash water from 16 to 21 ft bgs		
18							
20	20-25' (SO) Sonic	---	60"	---	0-6" GNEISS to GNEISSIC SCHIST 6-12" GNEISS to GNEISSIC SCHIST (intact transition into tan/rose SCHIST)		
22					12-60" White/rose SCHIST		
24							
					End of Boring at 25 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (4/26)
5 to 25'=Interval sampling with sonic rig
16-25'=Rock Cored utilizing sonic casing; further coring not conducted due to rapid water/NAPL outflow from the borehole (artesian cor
Boring complete to 25' bgs; Grouted to surface

Contractor: Advanced Drilling Technology					**PARSONS** DRILLING RECORD	BORING/ WELL NO.	Sheet 1 of 1 **CONT-7**
Driller: Chris Mason, Chris Jenkins						Location Description:	
Inspector: Zohar Lavy					PROJECT NAME: Consolidated Edison West 45th Street PDI	West 45th Street, Manhattan, NY	
Rig Type: Sonic					PROJECT NUMBER: 446672-05000		
GROUNDWATER OBSERVATIONS						Location Plan	
Water Level	DTW ~5 ft bgs	DTW			Weather: Rain, low 70s		
Date	5/1/2012				Date/Time Start: 5/1/12; 0900	See Site Plan	
Time	945				Date/Time Finish: 5/1/12; 1430		
Meas. From	Split Spoon	Top of Casing					

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-8" ASPHALT 8-24" Moist, brown fine to coarse SAND and COBBLE Encountered ground water at 24" bgs. Dig bar advanced to 60" in several locations		Upon advancing air knife to 2 ft bgs, the water level within the hand clearance hole rose to 0.5 ft bgs.
2							
4							
6	5-10' (SO) Sonic	---	24"	62.5	Wet, highly weathered GNEISSIC SCHIST, some brown fine to coarse SAND, little Brick, trace round fine to medium Gravel		
8							
10	10-15' (SO) Sonic	---	20"	124.0	0-10" CONCRETE and weathered GNEISSIC SCHIST COBBLES 10-20" Weathered GNEISSIC SCHIST COBBLES		
12							
14							
16	15-20' (SO) Sonic	---	60"	---	0-48"Black GNEISSIC SCHIST, white Schist banding; 48-60" Black GNEISSIC		
18							
20	20-24' (SO) Sonic	---	12"	---	0-4" Black GNEISSIC SCHIST, white Schist banding 4-12" White SCHIST		
22							
					End of Boring at 24 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance
5 to 24'=Interval sampling with sonic rig
15 to 24'=Rock Cored with sonic casing; further coring was not possible due to rapid water flow out of the borehole (artesian conditions)
Boring complete to 24' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. CONT-8 Sheet 1 of 1

Contractor: Advanced Drilling Technology
Driller: Joey McGill, Jamey Meyers
Inspector: Zohar Lavy
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW ~5'	DTW		
Date	6/4/2012			
Time	945			
Meas. From	Hand Clearance	Top of Casing		

Weather: Cloudy, high 70s
Date/Time Start: 6/25/12; 1300
Date/Time Finish: 6/25/12; 1400

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
0	Vac-Tron	Hand-Cleared	---		0-7" ASPHALT		Observed Water Level at 5 ft bgs
				0.0	7-60" Moist to wet, brown fine to coarse SAND and sub-angular GRAVEL		
2							
4							
6	5-10' (SO) Sonic	---	60"	0.0	0-30" Wet, orange/grey medium SAND, some fine to coarse sub-angular to round Gravel, trace weathered Gneissic Schist		
				1.7	30-48" Wet, grey, fine to medium SAND and weathered GNEISSIC SCHIST		
8				2.4	48-60" Wet, grey, fine to medium SAND and weathered GNEISSIC SCHIST, trace Brick, trace Wood		
10	10-15' (SO) Sonic	---	60"	18.2	0-40" Wet, light brown/grey fine to medium SAND, little fine to medium sub-angular to sub-round Gravel, little Silt, trace Brick, trace green Clay		
12				106.0	40-50" CONCRETE		
				481	Moist WOOD and BRICK, strong hydrocarbon odor		
14							
16	15-20' (SO) Sonic	---	48"	245.0	0-30" Moist, tan/orange SILT, little fine Sand		
				46.5	30-40" Wet, brown/orange medium SAND, trace Silt		
18				58.7	40-48" Wet, brown/orange medium SAND and highly weathered, micaceous GNEISS, trace medium sub-angular Gravel, trace Silt, slight hydrocarbon odor		
20	20-23.5' (SO) Sonic	---	30"	384.0	Wet, brown/red fine to coarse SAND, some fine to medium sub-angular to round Gravel, trace weathered Gneissic Schist, trace Silt, slight hydrocarbon odor		
22							
24	23.5-24.5' (SO) Sonic	---	12"	685	0-10" Wet, brown/red fine to coarse SAND and fine to medium sub-angular to round Gravel, NAPL blebs, strong hydrocarbon odor		
25					10-12" Weathered SCHIST, little Concrete, trace Brick		
26	24.5-25.5' (SC) Sonic Casing	---	12"	---	White SCHIST		
					End of Boring at 25.5 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance
5 to 25.5'=Interval sampling with sonic rig
24.5-25.5'=Rock Cored with sonic casing
Boring complete to 25.5' bgs; Grouted to surface

PARSONS
DRILLING RECORD

BORING/ WELL NO. MW-24 (Sheet 1 of 1)

Contractor: Aquifer Drilling & Testing Inc.
Driller: J. Meyers, J. McGill
Inspector: Zohar Lavy/Noah Garguilo
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

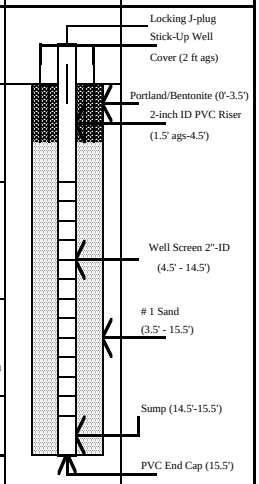
Weather: Cloudy, mid 90s
Date/Time Start: 6/20/12 ; 0900
Date/Time Finish: 6/21/12; 1320

Location Plan
See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	DTW 5 ft bgs	DTW 1.35 (~0.5 ft above grade)		
Date	6/20/2012	6/26/2012		
Time	925	1125		
Meas. From	Sonic Sampler	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL
+2					
0	Vac-Tron	Hand-Cleared	---	---	0-8" ASPHALT
					8-60" Moist, brown, fine to coarse SAND, some Cobble and Brick, little fine to coarse sub-angular to round Gravel, trace Wood
2					
4					
	5-10' (SO) Sonic	---	48"	1067	0-14" Wet, black fine to coarse SAND, some sub-angular fine to coarse Gravel, trace Wood, trace Silt, NAPL saturation, strong hydrocarbon odor, staining
6					
				586	14-36" Moist grey fine to medium SAND, some Wood, little weathered Gneiss Gravel, trace Brick
8				377	36-48" Moist, grey fine to medium SAND, trace Silt, slight hydrocarbon odor
10	10-13' (SO) Sonic	---	36"	3.1	0-12" Moist, grey/light green fine SAND and SILT, trace Clay, trace sub-round to sub-angular fine to medium Gravel
				3.5	12-28" Wet, BRICK
				3	28-36" Moist, dark brown fine to medium SAND, little sub-angular fine to medium Gravel
12					
	13-16' (SC) Sonic Casing	---	10"	---	Weathered SCHIST
14					
					End of Boring at 16 ft bgs



SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/7)
5-16'=Interval sampling with sonic rig
Rock Coring not conducted, artesian conditions encountered; sonic casing advanced into rock from 13 to 16 ft bgs
Boring complete to 16' bgs; Installed MW-24 to 15.5 ft bgs (2" well)

PARSONS
DRILLING RECORD

BORING/ WELL NO. PW-1 Sheet 1 of 1

Contractor: Aquifer Drilling & Testing Inc.
Driller: J. Meyers, J. McGill
Inspector: Zohar Lavy/Noah Garguilo
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

Weather: Cloudy, mid 90s
Date/Time Start: 6/20/12 ; 0900
Date/Time Finish: 6/21/12; 1320

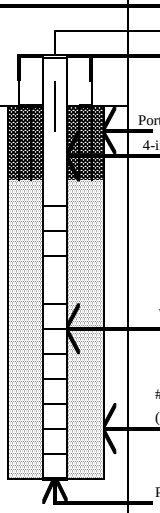
Location Plan
See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	DTW 5 ft bgs	DTW 1.35 (~0.5 ft above grade)		
Date	6/20/2012	6/26/2012		
Time	925	1125		
Meas. From	Sonic Sampler	Top of Casing		

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL
+2					
0	Vac-Tron	Hand-Cleared	---	---	0-8" ASPHALT
				1.6	8-60" Moist, brown, fine to coarse SAND and sub-angular to round GRAVEL, slight naphthalene-like odor
2					
4					
	5-10' (SO) Sonic	---	8"	2987	Wet, dark grey medium SAND, some angular to sub-angular fine to coarse Gravel, trace Wood, NAPL saturation (dark brown, non-viscous), strong hydrocarbon odor, staining
6					
8					
10	10-12.5' (SO) Sonic	---	30"	1.5	0-12" CONCRETE; 12-30" BRICK AND MORTAR
12					
					Very hard drilling from 12.5-16 ft bgs; no sample retrieved from 12.5 to 16 ft bgs
14					
					End of Boring at 16 ft bgs

SCHEMATIC



COMMENTS

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/5)
5-16'=Interval sampling with sonic rig
Rock Coring not conducted, artesian conditions encountered
Boring complete to 16' bgs; Installed PW-1 to 14 ft bgs (4" well)

PARSONS
DRILLING RECORD

BORING/ WELL NO. PW-2 — Sheet 1 of 2

Contractor: Aquifer Drilling & Testing Inc.
Driller: J. Meyers, J. McGill
Inspector: Zohar Lavy/Noah Garguilo
Rig Type: Sonic

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS

Water Level	DTW	DTW 4.13		
Date		6/26/2012		
Time		935		
Meas. From	Sonic Sampler	Top of Casing		

Weather: Clear, 80s (6/8/12); Partly Cloudy, mid 90s (6-22-12)

Date/Time Start: 6/8/12 ; 1200

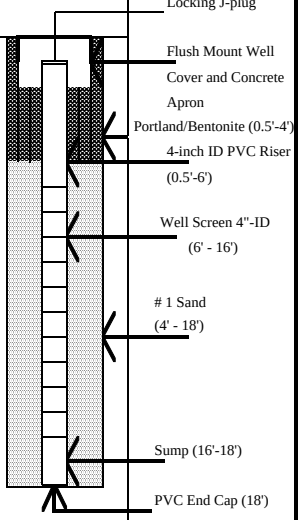
Date/Time Finish: 6/22/12; 0830

Location Plan

See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	COMMENTS
0	Vac-Tron	Hand-Cleared	---	---	0-8" CONCRETE	
				6.1	8"-60" Moist, brown, fine to coarse SAND and GRAVEL, some Cobbles in 30" to 60" zone, slight naphthalene-like odor; No groundwater encountered during hand clearance	
2						
4						
6	5-10' (SO) Sonic	---	20"	163	0-18" DEBRIS (primarily wood, brick), little Cobbles, little Gravel, heavy NAPL blebs to light saturation/coating on wood; Light blebs on debris/gravel	
8					18"-20" Grey, fine to medium SAND and weathered SHIST; NAPL blebs rare (1/4" to 1/2" diameter)	
10	10-15' (SO) Sonic	---	32"	125	0-6" Wet, black, SAND and weathered GNEISSIC SHIST, rare NAPL blebs (1/2" diameter), strong fuel-oil-like odor	
12				772	6"-32" Brown, fine to coarse SAND, little Silt, trace fine Gravel, rare NAPL blebs (1/4" diameter), strong fuel-oil-like odor	
14						
16	15-20' (SO) Sonic	---	44"	618	0-12" Moist, brown, fine SAND and SILT, some weathered Brick, rare NAPL blebs (1/4" diameter), mild fuel-oil-like odor	
18				683	12"-44" Dry, red, BRICK and MORTAR, slight sheen (1/2" to 1") in patches, mild fuel-oil-like odor	
20	20-25' (SO) Sonic	---	44"		0-44" BRICK, slight fuel-oil-like odor	
22						
24						
26	25-30' (SO) Sonic	---	60"	32.1	0-60" BRICK, no odor	
28						
30	30-35' (SO) Sonic	---	48"	178	0-48" BRICK, no odor	
32						
34						
36	35-40' (SO) Sonic	---	48"	---	0-48" BRICK, slight fuel-oil-like odor	
38						
40	40-45' (SO) Sonic	---	60"	0	0-12" CONCRETE, trace Brick	Boring stopped temporarily at 40 bgs on 6/8/12.
					12-48" CONCRETE	

Please see Sheet 2



SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/7/12) ; 5 to 49' sonic rig
Boring complete to 49' bgs; Installed PW-2 to 18 ft bgs (4" well)

Additional Notes:
1. Drilled 6/8/12 by Jeremy Meyers utilizing Rotosonic rig. Logging by Noah Garguilo. Drilled to 40 ft bgs
2. Drilled 6/22/12 by Joey McGill utilizing Rotosonic from 40-49 ft bgs. Logged by Zohar Lavy

Contractor: Aquifer Drilling & Testing Inc.
Driller: J. Meyers, J. McGill
Inspector: Zohar Lavy/Noah Garguilo
Rig Type: Sonic

PARSONS
DRILLING RECORD

PROJECT NAME: Consolidated Edison West 45th Street PDI
PROJECT NUMBER: 446672-05000

BORING/ WELL NO. PW-2 Sheet 2 of 2
Location Description: West 45th Street, Manhattan, NY

GROUNDWATER OBSERVATIONS				
Water Level	DTW	DTW 4.13		
Date		6/26/2012		
Time		935		
Meas. From	Split Spoon	Top of Casing		

Weather: Clear, 80s (6/8/12); Partly Cloudy, mid 90s (6-22-12)
Date/Time Start: 6/8/12 ; 1200
Date/Time Finish: 6/22/12; 0830

Location Plan
See Site Plan

Sample Depth	Sample/ Method	Blow Count	Rec.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC	COMMENTS
42	40-45' (SO) Sonic				48-60" Weathered white SCHIST (Please see Sheet 1 of this Log for 0-48")		
44							
	45-49' (SO) Sonic	---	24"		Black GNEISSIC SCHIST (vertical banding and fractures)		
46							
48							
					End of Boring at 49 ft bgs		

SAMPLING METHOD
SO = SONIC RIG
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

0 to 5'=Hand-Clearance (6/7/12) ; 5 to 40' sonic rig.
Boring complete to 49' bgs; Installed PW-2 to 18 ft bgs (4" well)

Additional Notes:
1. Drilled 6/8/12 by Jeremy Meyers utilizing Rotosonic rig. Logging by Noah Garguilo. Drilled to 40 ft bgs
2. Drilled 6/22/12 by Joey McGill utilizing Rotosonic from 40-49 ft bgs. Logged by Zohar Lavy

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-3
Sheet 1 of 1
Location Description:

Weather: Cloudy, 40°F
Date/Time Start: 4-1-03 / 1305
Date/Time Finish: 4-2-03 / 1150

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 Feet. Cuttings; Lt Brn to Olive Gray; F. SAND, some Fc Gravel; loose; moist.			
		2						
		4						
0	SB3-		50	7	Lt Brn; F. SAND, trace F. Gravel; loose; wet (5.0-5.7)		SP	
0	0507	6		2				
				3	Lt Brn; SILT; medium stiff; moist (5.7-6.0).		ML	
				6				
0.1			40	3	Dk Brn; Fm SAND, little Fc Gravel; medium dense; saturated.		SP	
0.7		8		4				
				7	Weathered SCHIST in spoon.			
				50/2"	Spoon Refusal at 9 Feet.			
		10			Auger Refusal at 10 Feet.			
					Core Run: 10-15 Feet. Recovery: 58/60 = 97% RQD: 55/60 = 92%			
		12			Dk Gray; mica SCHIST; micaceous and mafic minerals (phaneritic); highly folded (10-10.5) White/Pink; QUARTZ; top and bottom surfaces of vein dip at 45° (10.5-11.5).			
		14			Dk Gray; mica SCHIST; micaceous and mafic minerals; highly folded (11.5-15).			
					Total Depth = 17 Feet.			
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI					DRILLING RECORD	BORING/ WELL NO. SB-5		
Driller: Bob Vcrpent					PROJECT NAME ConEd-W. 45th St.	Sheet 1 of 1		
Inspector: W. Lilley					PROJECT NUMBER 440090	Location Description: Northside - center		
Rig Type: Failing 6								
Method: HSA / coring					Weather Cloudy 15° Windy	Location Plan See Site Plan		
GROUNDWATER OBSERVATIONS					Date/Time Start 1/27/03 8:30			
Water Level	5.0'				Date/Time Finish 1/28/03 11:32			
Date	1/27							
Time	12:00							
Meas From	Grade							
PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Brown sand and gravel (fill)			
0		2	37	8				
				8	Brown to gray sand, some gravel, little silt (moist to wet) No NAPL			
				2				
0.3		4	33	2				
				4	Brown sand and gravel, little silt (moist to wet) No NAPL			
				3				
52.7		6	33	5				
				8				
				20	Brown sand and gravel, little silt (wet) slight sheen & odor No NAPL			
				14				
1356		8	50	8				
				2				
				1	SKA (saturated, soft) No NAPL, sheen, or odor			
				1				
1900		10	50	4				
				9				
				8	Brown gravel, some sand, little silt (saturated) No NAPL			
				24				
3500		12	25	20				
				10				
				7	Brown/gray sand and gravel, concrete & brick (wet)			
				24				
12		14	20	20				
				10				
				15	Brown gravel & sand, little silt (wet) NO NAPL			
				20				
1600		16	40	60				
				28				
				50/4"	Brown & silver gravel, some sand, little silt, weathered rock Auger refusal at 16.5'			
		18			0.6' concrete			
					1.0' weathered mica schist			
					1.0' mica schist			
					0.25' weathered mica schist			
		20			Cored to 21.5' (NO NAPL)			
					RQD=13%			

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED

WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-6
Sheet: 1 of 1
Location Description:

Weather: Cloudy, 50°F
Date/Time Start: 4-2-03, 1245
Date/Time Finish: 4-2-03, 1330

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings: Lt Brn; fm SAND, some Silt/Clay, trace fc Gravel; saturated at 3.5 Ft.		SM/SC	
		2						
		4						
0.2	SB6-		45	2	Lt Brn; fm SAND, little Silt/Clay,		SW	
3	0507	6		2	trace f. Gravel; medium dense;		SCHIST	
				12	saturated (5.0-5.4).			
				30	Dk Gray to Amber; SCHIST, weathered (5.4-5.9)			
		8			Auger refusal at 7 Feet.			
		10						
		12						
		14						
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-7
Sheet: 1 of 1
Location Description:

Weather: Sunny, 40 °F
Date/Time Start: 4-1-03, 1225
Date/Time Finish: 4-1-03, 1300

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings: Lt Brn; fm SAND, little fc Gravel; moist.		SW	
		2						
		4						
0.1	SB7-0507	5	65	8	Lt Brn; fm SAND, trace F. Gravel; medium dense; wet (5.0-6.0).		SP	
0		6		6				
0				20	Amber; SCHIST, weathered; moist (6.0-6.3).		SCHIST	
				50/3"				
		8			Auger Refusal at 7 feet.			
		10						
		12						
		14						
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison 0 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-8
Sheet: 1 of 2
Location Description:

Weather: Partly Cloudy, 55°F
Date/Time Start: 4-23-03, 1010
Date/Time Finish: 4-23-03, 1440

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings; Lt Brn; fmc SAND, little fc Gravel; wet.		SW	
		2						
		4						
~~MW-6~~ 2			30	29	Olive Gray; F. SAND, little fc Gravel; micaceous grains; medium dense; saturated.		SP	
		6		16				
				8				
				6				
8			30	2	Lt Brn; F. SAND, trace fc Gravel; loose; saturated.		SP	
		8		2				
				2				
				2				
12			25	1	Lt Brn; F. SAND, trace fc Gravel; very loose; saturated; slight NAPL sheen, Red brick in tip of spoon.		SP	
		10		1				
				1				
				2				
4	SB8-1113		85	1	Lt Brn; F. SAND, trace F. Gravel;		SP	
10	SB8-1113MS12			5	loose; saturated.		SP	
3	SB8-1113MD			3	Lt Green; Fm SAND, trace F. Gravel;			
				3	loose; saturated.			
5			50	39	Lt Green; Fm SAND, trace F. Gravel;		SP	
2		14		19	micaceous grains; medium dense; saturated (13.0-13.2).		SCHIST	
				3	Lt Gray; SCHIST; weathered; medium			
				10	dense; saturated (13.2-14.0).			
23			35	6	Olive Gray; SCHIST; weathered;		SCHIST	
		16		9	medium dense; saturated.			
				11				
				10				
			0	1	No Recovery, wood in tip of spoon.		NR	
		18		10				
				8				
				1				
22			30	4	Olive Gray; F. SAND, trace F. Gravel;		SP	
		20		5	micaceous grains and NAPL film;			
				5	medium dense; saturated.			

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-8

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

Weather
Date/Time Start
Date/Time Finish

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS				
Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		21		60	Continued from above.			
13			25	25	Lt Brn to Olive Gray; F. SAND,		SP	
				11	trace f. Gravel; medium dense;			
				5	saturated.			
		23		5				
363			30	5	Olive Gray; f. SAND, trace f. Gravel		SP	
				4	medium dense; saturated (23.0-23.3).			
				6	Olive Gray; fm SAND, little f. Gravel; NAPL			
		25		2	present; saturated (23.3-23.4). Olive Gray; f. SAND, trace f. Gravel; med dense, saturated (23.4-23.6)			
18	SBS-2527		45	25	Olive Gray; f. SAND, trace f. Gravel;		SP	
492	D042303			11	wood present; medium dense; saturated (25.0-25.1).		SCHIST	
				3	Amber to Lt Gray; SCHIST; weathered;			
		27		4	saturated (25.1-25.9).			
			0	9	No Recovery. Steel plug lost at		NR	
				5	bottom of borehole			
				5				
		29		5				
					Augered to 36 feet.			
		31						
		33						
		35						
					Auger refusal at 36 feet.			

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT	DRILLING RECORD	BORING/ WELL NO. SB-9	
Driller: Victor Champagne	PROJECT NAME Con Edison W 45th St. Works	Sheet 1 of 1	
Inspector: Mike Wilkinson/AD	PROJECT NUMBER 440090	Location Description:	
Rig Type: CME LC-60			
Method: HSA	Weather Cloudy, intermittent light rain, 40°F	Location Plan: See Site Plan	
GROUNDWATER OBSERVATIONS	Date/Time Start 4-4-03 / 1115		
Water Level / Date / Time / Meas. From	Date/Time Finish 4-7-03 / 1030		

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
		2			Hand Augered to 5 feet. Cuttings; Brown, fm SAND, saturated.			
		4						
0			25	33	Brown; fm SAND, little cSand to f. Gravel; micaceous grains; ~~some~~ medium dense; saturated.		SW ~~SP~~	
		6		14				
				4				
				2				
0			25	11	Brown; fm SAND, fc Gravel; micaceous grains; medium dense; saturated.		SP	
		8		8				
				4				
				9				
2.5			8	7	Dk Brn to Olive Gray; fm SAND, little f. Gravel, little Silt; medium dense; saturated.		SM	
		10		3				
				25				
				4				
25	SB9-1113		25	4	Olive Gray to Lt Brn; mc SAND, little f Gravel, little ~~Silt~~ Silt, NAPL odor present; very dense; saturated. (wood present)		SM	
		12		7				
				50/5"				
		14			Core Run: 13-18 Feet Recovery: 4.3/5.0 = 86% RQD: 29/60 = 48% Dk Gray; SCHIST; highly folded with siliceous veins throughout; broken into pieces less than 4" long (13-15.4). Dk Gray; SCHIST; competent (15.4-16.8). Pink; QUARTZ; vein with 45° fracture at 17.4 ft. (16.8-17.8) Dk Gray; SCHIST; competent (17.8-18.0).			
		16						
		18						
					Total Depth = 18 feet			
		20						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-10
Sheet: 1 of 2
Location Description:

Weather: Sunny, 50-60°F
Date/Time Start: 4-14-03 / 0900
Date/Time Finish: 4-15-03 / 0805
Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
		2			Augered to 5 Feet. Cuttings: Lt Brn; CLAY, some fn Sand, little fc Gravel; saturated.		CL	
		4						
0		6	35	2 50/5"	Olive Gray; fmc SAND, little f. Gravel, trace Clay/Silt; saturated (5.0-5.2). Amber; SCHIST, weathered (5.2-5.7).		SW SCHIST	
		8			Augered to 9 Feet.			
0.4		10	35/40 20	3 4 4 3	Olive Gray; fc GRAVEL, little fmc Sand, trace Clay/Silt; loose; saturated.		GW	
		12	0	3 2 2 2	No Recovery - Rock in tip of spoon.		NR	
		14	0	7 4 4 3	No Recovery - Loose gravel in spoon.		NR	
		16			Void Space (15-23 Feet).		VOID	
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-10

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Weather
Date/Time Start
Date/Time Finish

Location Plan — See Site Plan

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		21						
					Continued from above.		VOID	
		23						
0.8			25	48	Lt Greenish Gray; CEMENT.		CEMENT	
				5				
				3				
		25		3				
12			15	3	Brn; F. SAND, little Fc Gravel; loose; saturated.		SP	
				3				
				3				
		27		2				
30+9			30	35	DK Gray; Fm SAND, some Fc Gravel; micaceous grains; medium dense; saturated; creosote-like odor.		SP	
				11				
				13				
		29		13				
30			15	1	Olive Gray; Fm SAND, little Clay, little F. Gravel; amber colored NAPL present; medium dense; saturated.		SC	
				1				
				14				
		31		8				
82			35	19	Lt Brn; CLAY; saturated (31.0-31.5);		CL	
38				10	Olive Gray; F. SAND, trace F. Gravel; medium dense; saturated (31.5-31.7).		SP	
				6				
		33		6				
56			50	1	Olive Gray; F. SAND; med dense; saturated (33.0-33.4).		SP	
9999	SB10-3335			1	DK Gray; F. SAND; trace F. Gravel; medium dense; saturated; strong NAPL odor (33.4-33.6).		SP	
				17				
		35		60/2"	Red Brn; BRICK.		BRICK	
					Augered to 36.5 Feet			
					Auger Refusal at 36.5 Feet.			

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-11
Sheet: 1 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: Cloudy, some rain, 50°F
Date/Time Start: 4-22-03 / 1150
Date/Time Finish: 4-22-03 / 1500
Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
		2			Augered to 5 Feet. Cuttings: Olive Gray; SILT, some F. Sand, little fc Gravel; wood present; wet.			
		4						
33	SB11-0507	6	35	3	Olive Gray to DK Gray; fm SAND, little F. Gravel; water-like NAPL with strong odor; loose; saturated		SP	
61				3				
				2				
				3				
			0	3	No Recovery		NR	
		8		2				
				3				
				3				
0.3			25	1	Lt Brn; fm SAND, little fc Gravel; slight NAPL odor; loose; saturated		SP	
		10		2				
				2				
				2				
0			20	1	Lt Brn; SILT, some fmc Sand, trace F. Gravel; medium stiff; saturated.		ML	
		12		3				
				3				
				1				
			0	1	No Recovery		NR	
		14		1				
				1				
				1				
0			5	1	Lt Brn; fm SAND, trace F. Gravel; sewage-like odor; very loose; saturated.		SP	
		16		1				
				WOR				
				WOR				
				WOR				
		18		WOR				
				WOR				
				WOR				
				WOH	Olive Gray; fm SAND trace F. Gravel; sewage-like odor; very loose; saturated (possible slough)		SP	
		20		WOH				
				WOH				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

PROJECT NAME
PROJECT NUMBER

BORING/ WELL NO. SB-11

Sheet 2 of 2

Location Description:

Location Plan See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		21		WOH				
				WOH	Continued From above			
				WOH				
				WOH				
		23		WOH				
18			30	11	Olive Gray to DK Gray; Fm SAND, little F Gravel; with concrete Fragments; dense; saturated.		SP	
				18				
				18				
		25		50/1"				
					Auger Refusal at 25 Feet.			

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

DRILLING RECORD

Contractor: WGI
Driller: Bob Verpent
Inspector: W. Lilley
Rig Type: Failing 6
Method: HSA

BORING/WELL NO. SB-12

PROJECT NAME ConEd-W. 45th St
PROJECT NUMBER 440090

Sheet 1 of 1
Location Description: East center

Weather 9°, Cloudy/Windy
Date/Time Start 1/28/03 9:29
Date/Time Finish 1/28/03 14:23

Location Plan — See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Brown sand and gravel (fill)			
0		2	25	3				
				11	Brown to gray sand, silt &			
				5	gravel (fill) No NAPL, odor			
				10	or sheen			
0		4		3				
				15	Rock & brick (fill)			
				12	(moist to wet)			
				11	No NAPL, odor, or sheen			
0		6		14				
				11	Black & gray sand & gravel			
				24	weathered mica schist			
				16	(wet) MGP odor			
NA		8		1				
					VOID (no sample)			
57		10		109	Brown sand & gravel			
				9	3" mica schist at bottom			
				7	(wet) MGP odor			
				9				
0		12		10				
				12	Red/brown coarse-med fine sand			
				14				
				16	Red/brown sand & gravel			
0		14		5	very stiff (moist)			
				8	No NAPL, odor, sheen			
				17				
				48				
0		16		14				
				100/5"	Brown sand, little silt			
					(moist to wet)			
0		18			No NAPL, odor, sheen			
					Auger refusal at 19.9'			
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-13
Sheet: 1 of 1
Location Description:

Weather: Cloudy, 55-60°F
Date/Time Start: 4-21-03 / 1040
Date/Time Finish: 4-21-03 / 1330

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings: Lt Brn; fm SAND, little Silt, little fc Gravel; wet.			
		2						
		4						
0.5			35	3	Dk Gray; SCHIST; saturated. & weathered;		SCHIST	
		6		12				
				23				
				15				
0			15	7	Red; BRICK.		BRICK	
		8		4	Dk Gray; BRICK.			
				4				
				2				
			0	5	No Recovery		NR	
		10		22				
				7				
				4				
6			20	11	Lt Greenish Gray; CEMENT		CEMENT	
		12		50/5"				
					Augered to 14 feet.			
		14						
					Auger Refusal at 14 feet.			
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-15
Sheet: 1 of 1
Location Description:

Weather: Cloudy, 40°F
Date/Time Start: 4-18-03 / 1035
Date/Time Finish: 4-18-03 / 1200

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0			Augered to 5 feet.			
		2						
		4						
1	SB15-0507	6	15	1	Olive Gray; F. SAND, trace F. Gravel; sheen and NAPL odor present; loose; saturated.		SP	
				2				
				2				
				1				
			0	1	No Recovery, red brick in tip of spoon.		NR	
		8		1				
				50/2"				
		10			Augered to 13 Feet, hard material.			
		12						
		14			Red Brick and Cement		BRICK & CEMENT	
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS: Hard material (brick) From 8-15 Feet. Possibly drilling on holder wall.

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-16
Sheet: 1 of 1
Location Description:

Weather: Cloudy, 45°F
Date/Time Start: 4-21-03 / 1330
Date/Time Finish: 4-22-03 / 1130

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 10 feet.			
		2						
		4						
		6						
		8						
		10						
			4	6	Lt Greenish Gray; CEMENT.		CEMENT	
				4				
				3				
		12		50/5"				
					Core Run: 12-17 feet.			
					Recovery: 40/60 = 67%			
					RQD: 24/60 = 40%			
		14			Lt Gray; CONCRETE (12-13.5)			
					No Recovery (13.5 to 14.5) → soft.			
					Lt Gray; QUARTZITE(?); cemented silica grains with sparse micas (14.5-17)			
		16						
					Total Depth = 17 Feet			
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

P:\739437\mxd\FSP\Fig4

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-17
Sheet: 1 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Weather: Sunny, 70-80°F (15th) Cloudy, 45°F (17th)
Location Plan: See Site Plan
Date/Time Start: 4-15-03 / 0900
Date/Time Finish: 4-17-03 / 1120

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. No cuttings.			
		2						
		4						
0.4			50	2	Olive Gray; f. SAND, little Clay, trace f. Gravel; very loose; saturated		SM	
0.4		6		1				
				2				
				1				
0			15	50/3"	Olive Gray; fm SAND, trace f. Gravel; micaceous grains present; saturated. Gravel (schist) in tip of spoon. Auger refusal at 8.5 feet		SP	
		8						
					Augered to 10 feet. DK Gray; SCHIST boulder (8.5-9.5).			
		10						
0	SB17-1012		40	1	Olive Gray; f. SAND, little Silt, trace fc Gravel; micaceous grains present; loose; saturated.		SM	
21				1				
				3				
		12		2				
0.7			30	3	Olive Gray to DK Gray; f. SAND some fc Gravel; micaceous grains and Schist Gravel present; dense; saturated		SP	
				30				
				11				
		14		11				
				5	No Recovery. Rock in tip of spoon.		NR	
				20				
				50/5"				
		16						
					Augered to 20 feet.			
		18						
		20						
4.5			50	10	Lt Gray to Lt Brn; c GRAVEL		GP	

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-17

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan — See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
0.4		21		8				
				6	(Schist), some F Sand; medium			
				10	dense; saturated.			
4			45	9	Brn; F. SAND, some F. Gravel;		SP	
4		23		12	dense; saturated (22.0-22.4),		SCHIST	
				41	Amber; SCHIST, weathered			
				50/2"	(22.4-22.9). Auger refusal at 24 feet.			
					Cored to determine depth to		SCHIST	
		25			bedrock;			
					Dk Gray; SCHIST (24-26).			
					Void Space (26-31).		VOID	
		27						
		29						
					Rod Fell from 26-31 Feet.			
		31						
					Total depth = 31 Feet.			

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: RV, Manny
Inspector: Eric Mysona
Rig Type: Failing F10
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Ed W. 45th St
PROJECT NUMBER: 440090

BORING/ WELL NO.: SB-18
Sheet 1 of 2
Location Description:

Weather: 20° cloudy, breezy
Date/Time Start: 1/15/03 13:00
Date/Time Finish: 1/16/03 9:30

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	4'			
Date	1/15/03			
Time	13:12			
Meas. From	Grade			

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
NA				A	moist gravel & sand (fill) no sheen, no odor			
				A				
				A				
		2		A				
NA				A				
				A				
				A				
		4		A				
			40	6	wet brick, sand, gravel & rock fragments (fill)			
5.3				100/4"				
		6						
			40	47	wet brick, rock, gravel (fill) slight MGP odor, no sheen			
4.2				60				
				20				
		8		24		SNDGRV		
			50	15				
20.4				23				
				25				
		10		30				
			35	14	wet mica schist and brick fill, no odor, no sheen			
1.2				15				
				23				
		12		20				
			40	42	wet mica schist fragments, no sheen, slight MGP odor			
3.9				64				
				50				
		14		34				
			35	18	wet brick & mica schist fill, no odor, no sheen			
5.6				25				
				24				
		16		32				
			10	10				
1.7				9				
				11				
		18		12				
			45	5	wet black/gray micaceous sand with sheen and MGP odor			
11.4				4				
				5		GRVSND		
		20		20				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

PROJECT NAME
PROJECT NUMBER

BORING/ WELL NO. SB-18

Sheet 2 of 2

Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20						
			60	44	wet black/gray, well-sorted micaceous sand w/ brick fragments, sheen, MGP odor	GRVSND		
194				42				
				35				
		22		46				
			60	39				
26.5				69				
				100	wet mica schist fragments with sand, sheen, MGP odor	SNDGRV		
		24		34				
			35	49				
31.3				95				
				100/5"	wet mica schist, NAPL, MGP odor	SCHIST		
		26			Auger refusal at 25'3" on bedrock			
		8						
		10						
		12						
		14						
		16						
		18						
		20						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: RV Gregory / Manny
Inspector: Eric Mysona
Rig Type: Failing FID
Method: HSA / Coring

DRILLING RECORD

PROJECT NAME: Con Ed-W 45th St
PROJECT NUMBER: 440090

BORING/ WELL NO.: SB-19
Sheet 1 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level	6'			
Date				
Time				
Meas. From	Grade			

Weather: 28°, flurries, windy
Date/Time Start: 1/20/03 14:50
Date/Time Finish:
Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
				A	moist gravel & sand (fill) no odor			
				A				
				A				
		2		A				
			35	5	moist brown sand, silt & gravel, slight MGP odor No NAPL			
25.7				7				
				10				
		4		10				
			10	2				
44.2				7				
				10	Trace NAPL at 6'			
		6		6	wet dark gray sand w/ some silt, little gravel & brick fill			
			75	5		GRVSND		
46.8				3				
				4	NAPL-saturated 7-8'			
		8		20	MGP odor			
			90	17				
39.4				20				
				100/3"				
		10		0				
			60	29	wet dark gray sand w/ gravel, concrete and brick fragments, NAPL, MGP odor			
10.8				40				
				50/1"				
		12		0				
			5	6				
2.3				2				
				1				
		14		0				
			0	0				
0.9				0	No recovery	SNDSLT		
				0				
		16		0				
			15	0				
1.2				0				
				1	wet dark gray silt, some sand & gravel, NAPL, MGP odor			
		18		0				
			30	4				
3.7				4				
				3	wet gray silt, sand & gravel brick fill, sheen, MGP odor			
		20		3				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-19

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20						
			25	3	wet blue/gray and green			
4.9				4	silt w/ some clay, little sand	CLYSLT		
				5	sheen			
		22		5				
			35	1	wet dark gray silt with			
5.3				0	some sand, sheen, strong			
				1	odor			
		24		2				
			50	1		SNDSLT		
4.7				1				
				1				
		26		1				
			65	1	wet soft gray silt with			
15.4				0	some sand, sheen, strong			
				1				
		28		0	odor			
			20	4				
16.7				4				
				4				
		30		3				
			40	1	wet brown sand, some silt,			
380				2	trace brick fragments, sheen			
				1	NAPL, MG P odor	SLTSND		
		32		1				
			40	0				
220				0				
				0	Auger refusal at 34'			
		34		50/0"				
			100		moist competent concrete			
					w/ No NAPL, No odor			
		36			large gravel and some			
					mica schist cobbles	Concrete		
		38			cored from 34 to 39'			
					95% RQD			
		40						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: Sal/Manny
Inspector: Eric Mysona
Rig Type: Failing F10
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Ed-W 45th St
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-20
Sheet 1 of 2
Location Description:

Weather: 20°, partly cloudy breezy
Date/Time Start: 1/22/03 9:20
Date/Time Finish:

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	3'			
Date	1/22/03			
Time	9:35			
Meas From	Grade			

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
				A	moist gravel w/ sand fill			
				A	no odor/sheen			
				A				
		2		A				
			66	20				
3.7				12	wet gravel w/ sand fill			
				34	no odor/sheen	SNDGRV		
		4		100/1"				
			66	16				
6.1				100/3"	moist large mica schist boulder 5-8'			
		6						
				A				
NA				A	wet gravel w/ sand, no sheen, no odor			
				A				
		8		A				
			60	12				
26.6				13	wet plastic green/gray silty clay, no sheen/odor	SLTCLY		
				3				
		10		6				
			55	12				
15.6				9	wet gray sand & gravel w/ some gray/green silty clay			
				9	no odor/sheen	GRVSND		
		12		10				
			40	12				
6.7				7				
				6				
		14		8				
				36	wet gray gravel, schist fragments and sand fill			
1.1			35	8	no sheen/odor			
				7				
		16		14		SNDGRV		
			10	3				
8.8				5				
				17	wet dark gray gravel w/ sand, silt, wood fill			
		18		11				
				100	no sheen/odor			
6.1				16				
				34				
		20		7				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

DRILLING RECORD

BORING/WELL NO. SB20

Contractor:
Driller:
Inspector:
Rig Type:
Method:

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan — See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20						
			25	24	wet dark gray sand, silt, & gravel fill, slight MGP odor, trace sheen			
8.6				16				
				18				
		22		22				
			20	2				
4.3				3				
				9		GRVSND		
		24		12				
			25	2	wet gray and black micaceous sand w/ rock and brick fragments, slight MGP odor, no sheen			
14.5				6				
				20				
		26		18				
			35	5				
16.3				7				
				8				
		28		8				
			15	0	wet soft, dark gray micaceous sand with silt no odor/sheen			
5.9				0				
				0		SLTSND		
		30		11				
			40	16				
34.9				23				
				7	wet gray sand, gravel, silt brick fragments NAPL, MGP odor			
		32		7				
			35	12		GRVSND		
899				14				
				17				
		34		17	wet black clayey silt, NAPL, odor	CLYSLT		
				12				
2291				100/4"	wet weathered concrete w/ NAPL - 1" of mica schist at bottom of spoon	Concrete		
				A				
		36		A				
				100/1"	Auger refusal at 36.1' on concrete			
		38						
		40						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: Sal/Manny
Inspector: Eric Musona
Rig Type: Failing PID
Method: HSA

DRILLING RECORD

PROJECT NAME: ConEd-W.45th St
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-21
Sheet 1 of 2
Location Description:

Weather: 22° partly cloudy breezy
Date/Time Start: 1/24/03 9:15
Date/Time Finish:
Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level	8'			
Date	1/24/03			
Time	10:30			
Meas From	Grade			

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
				A	moist sand and gravel fill, no odors			
				A				
				A				
		2		A				
			40	17				
17.3				100/5"				
						SNDGRV		
		4						
			40	17				
56.7				16				
				5				
		6		8	moist black-stained gravel w/ sand fill, gasoline odor some NAPL (not saturated)			
			50	5				
978				4				
				0				
		8		4				
			30	—	wet black/gray/green sand, gravel, silt with hydrocarbon/gasoline odor No NAPL			
632				—				
				5				
		10		3				
			40	4				
44.8				1				
				1				
		12		3	wet black micaceous sand with gravel, silt, clay fill No odor, No sheen	GRVSND		
			70	4				
22.1				1				
				3				
		14		2				
			75	2	wet olive green and gray clayey silt with sand, gravel, brick fill No odor/Sheen			
97.4				2				
				4				
		16		7		CLYSLT		
			75	2				
64.7				2				
				4	wet non-plastic olive gray/ black clayey silt with sand, gravel, trace brick fragments no odor/sheen			
		18		5				
			60	4				
134				3				
				2	wet black sand with silt, some gravel, gas odor, strong sheen			
		20		26		SLTSNT		

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS: Hit obstruction (concrete) at 3' first attempt - moved 2' west

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-21

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20			wet black/red gravel w/ sand & silt			
1,168				57	isolated NAPL, gasoline odor	SNDGRV		
				97	wet, weathered black/gray			
552				100/1"	schist, isolated NAPL, gas odor	SCHIST		
		22			Auger refusal at 21.6' on bedrock			
		24						
		26						
		28						
		30						
		32						
		34						
		36						
		38						
		40						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: RV/Manny
Inspector: Eric Mysona
Rig Type: Failing FID
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Ed-W. 45th St
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-22
Sheet 1 of 2
Location Description: SW corner

GROUNDWATER OBSERVATIONS

Water Level	8'			
Date	1/15/03			
Time	8:20			
Meas. From	Grade			

Weather: 20°, partly cloudy
Date/Time Start: 1/14/03 14:50
Date/Time Finish: 1/15/03 10:35
Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0		A				
NA				A	moist sand and gravel fill (TP-6 backfill) no sheen / no odor			
		2		A				
0.0				A				
		4		A		SNDGRV		
NA				A				
		6		A				
			25	—	moist loose sand, gravel & silt, MGP odor, sheen			
20.2				100/4"				
		8		—				
			10	2				
2.5				1				
				1				
		10		2				
			45	10	wet soft gray silt, gravel & cobbles w/ MGP odor, some NAPL			
13.9				2				
				3				
		12		6				
			60	—	wet soft gray silt with some sand, trace clay slight MGP odor			
14.1				—				
		14		—		SNDSLT		
			70	—				
142				—				
				—				
		16		—				
			60	—				
1,468				—				
				—				
		18		—	wet gray silt with some sand, trace gravel, MGP odor, NAPL			
			65	—				
369				—				
				—				
		20		—				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-22

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20						
1028				—	wet gray silt w/ some sand trace gravel, MGP odor sheen			
				—				
				1				
		22		2				
1079				—	wet soft gray silt w/ some sand, trace gravel NAPL, MGP-odor	SNDSLT		
				—				
				1				
		24		2				
885				—				
				—	old weathered concrete			
				100/3"				
		26			Auger refusal at 25'3" on concrete			
		28						
		30						
		32						
		34						
		36						
		38						
		40						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: WGI
Driller: RV Gregory / Manny
Inspector: Eric Mulsona
Rig Type: Failing FID
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Ed - W. 45th St
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-23
Sheet 1 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level	8.9'			
Date	1/20/03			
Time	8:10			
Meas. From	Grade			

Weather: 20° partly cloudy
Date/Time Start: 1/17/03 8:20
Date/Time Finish:
Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
				A	moist gravel w/ sand (fill) no odor / no sheen	SNDGRV		
				A				
				A				
		2		A				
			85	8				
0.7				10				
				12				
		4		15				
15.7								
			40	30	moist gray/black sand, silt & gravel fill w/ No NAPL, Slight MGP odor wood debris at 8'			
4.2		6		29				
				14				
				14				
			45	16				
8.4		8		20				
				27	wet dark gray silt w/ sand little gravel, trace brick abundant NAPL, MGP odor	SNDSLT		
				29				
			40	8				
12.7		10		10				
				9				
				10				
			80	6				
29.6		12		7	wet dark gray sand, some silt, trace gravel, NAPL, large piece wood at 13'	SLTSND		
				8				
				8				
			25	—				
31.2		14		—				
				1				
				1				
			50	1	wet dark gray silt & sand some rock fragments, slight sheen & MGP odor			
3.7		16		1				
				1				
				1				
			75	—				
38.4		18		—				
				—	wet gray silt w/ some sand, trace gravel NAPL present throughout, MGP odor	SNDSLT		
				—				
			75	—				
60.2		20		—				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS: Auger refusal at 6' first attempt, moved 3' east, auger refusal at 13'. Final SB-23 location 5' west of proposed location

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

BORING/ WELL NO. SB-23

PROJECT NAME
PROJECT NUMBER

Sheet 2 of 2
Location Description:

Weather
Date/Time Start
Date/Time Finish

Location Plan See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		20						
				4	wet gray silt, some sand			
				2	trace gravel fill - NAPL	SND SLT		
				—				
216B		22		—	wet gray, sand, some silt			
				—	trace clay fill w/ NAPL			
				—		SLTSND		
54B				NA	MGP odor			
		24		NA				
				NA	Concrete			
					Auger refusal at 24.5' on concrete			
		26						
		28						
		30						
		32						
		34						
		36						
		38						
		40						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: SB-24
Sheet: 1 of 1
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: Partly Cloudy, 45°F
Date/Time Start: 4-24-03 / 0845
Date/Time Finish: 4-24-03 / 0925
Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings: Olive Gray; F. SAND, trace mc Sand to F. Gravel; moist, Saturated at 4 Feet.			
		2						
		4						
3	SB24-0507		60	2	Olive Gray; F. SAND, trace mc Sand to F. Gravel; wood fragments; loose; saturated (5.0-5.5).		SP	
0.1	D042403	6		5	Black; F. SAND, little c. Sand to F. Gravel; loose; saturated (5.5-5.7).		SP	
				60/2"	Amber to Whitish; SCHIST, weathered (5.7-6.2).		SCHIST	
		8			Auger refusal at 6 Feet.			
		10						
		12						
		14						
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: MW-1
Sheet 1 of 2
Location Description:

Weather: Rain on 4-11-03
Date/Time Start: 4-10-03, 1400
Date/Time Finish: 4-11-03, 1400

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 Feet. Cuttings: DK Brn; fm SAND, little F Gravel; brn to dk gray motor oil-like NAPL below 1 foot; wet.		SW	
		2						
		4						
193			30	1	Brn; fm SAND, trace F Gravel; brn to dk gray motor oil-like NAPL present; very loose; ~~wet~~ HW saturated.		SW	
		6		1				
				2				
				3				
551	MW1-	7.0-	35	2	Brn to DK Gray; F. SAND, little F. Gravel; schist fragments, micaceous grains and product present; loose; ~~wet~~ HW saturated.		SP	
739	0507	7.7 8		2				
				2				
				2				
95			40	3	Brn; F. SAND, little Fe Gravel, trace Silt; micaceous grains, product and red brick present; loose; ~~wet~~ HW saturated		SW	
125		10		2				
				2				
				5				
			65	6	Brn to DK Gray; fm SAND, little Fe Gravel; brn to dk gray motor oil-like NAPL present; loose; ~~wet~~ HW saturated.		SW	
		12		4				
109				3				
				4				
41			30	2	Lt Brn to DK Gray; F. SAND, trace cSand to c Gravel; very loose; ~~wet~~ HW saturated.		SP	
		14		1				
				1				
				1				
16			25	2	Olive Gray; F. SAND, trace Fe Gravel; loose; saturated.		SP	
		16		1				
				3				
HW				7				
827			HW 20	50 1	Olive Gray; F. SAND, trace F. Gravel; loose; saturated. Gravel with black product from 17.8-17.9 Feet. Silt at 17.9 Feet.		SP	
11		18		2				
				2				
				1				
8			20	WOH	Brn; SILT, little ~~fm~~ ~~SA~~ HW Sand, trace F. Gravel; very soft; saturated.		ML	
		20		WOH				
				1				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

PROJECT NAME
PROJECT NUMBER

BORING/ WELL NO. MW-1
Sheet 2 of 2
Location Description:

Weather
Date/Time Start
Date/Time Finish

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		21		1	Continued from above.			
16			60	1	Brn; F. SAND, little Silt, trace F. Gravel; loose; saturated		SM	
10				1				
				3				
		23		4				
6			45	1	Brn; fm SAND, little fc Gravel; very loose; saturated (23.0-23.3).		SW	
1				1			ML/CL	
				1	Brn; SILT/CLAY; some fm Sand, trace f. Gravel; very soft; saturated (23.3-23.9).			
		25		1				
			75	WOH	Lt Brn; SILT, little fm Sand, trace fc Gravel; very soft; saturated		ML	
				WOH				
				2				
		27		2				
			90	1	Lt Brn; CLAY, some fm Sand, trace f. Gravel; very stiff; saturated (27.0-28.6).	black syrup-like NAPL present;	CL	
				10				
				9				
		29		1	Olive Gray; fm SAND, little f Gravel; saturated (28.6-28.8)		SW	
			80	WOR	Brn; CLAY, little f. Sand, trace f. Gravel; very soft; saturated (29.0-30.6).		CL	
				WOR				
				WOR	Brn; fm SAND, trace f. Gravel; very loose; saturated (30.6-30.8).		SW	
		31		WOR				
			38	WOR	Lt Brn; CLAY, little fm Sand, trace f. Gravel; very soft; saturated.		CL	
				WOR				
				WOR				
		33		WOR				
				WOR				
				WOR				
				WOR				
		35		WOR				
			95	2	Lt Brn; CLAY, little fm Sand, trace f. Gravel; very soft; saturated (35.0-36.0).		CL	
				2				
				2	Lt Brn; fine SAND, little fc Gravel; loose; saturated (36.0-36.9		SW	
		37		100/5"				
					Total Depth = 36.9 Feet.			

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS: No PID readings were taken below 25 feet due to rain, ~~no product~~

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: MW-2
Sheet 1 of 1
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: Partly cloudy, low 40's
Date/Time Start: 4-17-03, ~~1100~~ 1145
Date/Time Finish: 4-17-03, 1300

Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 Feet. Cuttings: DK Brn; fm SAND, little Clay, little F. Gravel; saturated.		SC	
		2						
		4						
0	MW2-0507	5.0-5.8	50	3	Lt Brn; fm SAND, trace Clay; loose; saturated (5.0-5.8).		SP	
0		6		2				
				2	Dk Brn; WOOD, decayed with organic odor (5.8-6.0).			
				2				
			0	2	No Recovery, rock in tip of spoon.		NR	
		8		3				
				2				
				2				
0.2			40	1	Lt Brn; fm SAND, little F. Gravel; medium dense; saturated (9.0-9.4) ~~9.4~~ (9.8-10.2).		SP	
0.1		10		1			SCHIST	
				19	Dk Gray; SCHIST; wet (10.2-10.6).			
				50/1"				
		12			Augered to 15 Feet.			
		14						
		16			Total Depth = 15 Feet.			
		18						
		20						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: MW-3
Sheet: 1 of 2
Location Description:

Weather: Cloudy, 45-50°F
Date/Time Start: 4-2-03, 1420
Date/Time Finish: 4-3-03, 1515

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
					Augered to 5 feet. Cuttings: Lt Brn; fm SAND, little F. Gravel; wet.			
		2						
		4						
88			15	3	Brown; fm SAND, little F. Gravel; amber NAPL; loose; saturated. Rock in tip of spoon.		SP	
		6		5				
				4				
				3				
279			15	1	DK Gray to Brn; F. SAND, some Silt/Clay, trace F. Gravel; amber NAPL; loose; saturated. Rock in tip of spoon.		SP	
		8		4				
				3				
				3				
205	MW3-0911	9.0-9.5	50	1	Brn; fm SAND, little Silt/Clay, little F. Gravel; amber NAPL; very loose; saturated.		SC	
35		10		1				
				1				
				2				
238			70	1	Lt Brn; F. SAND, trace F. Gravel; amber NAPL; very loose; saturated.		SP	
		12		1				
				2				
				1				
			0	1	No Recovery		NR	
		14		1				
				4				
				3				
51			40	1	Olive Gray; fm SAND, little F. Gravel; blebs of black syrup-like NAPL, red brick from 15.4-15.8; very loose; saturated.		SP	
900		16		1				
				1				
				50				
			0	1	No Recovery		NR	
		18		1				
				1				
				1				
			0	1	No Recovery		NR	
		20		1				
				100/4				

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor:
Driller:
Inspector:
Rig Type:
Method:

DRILLING RECORD

PROJECT NAME
PROJECT NUMBER

BORING/ WELL NO. MW-3
Sheet 2 of 2
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather
Date/Time Start
Date/Time Finish

Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		21		WOH	Continued from above.			
			0	1	No Recovery		NR	
				1				
				1				
		23		1				
295	MW3-		40	7	Olive Gray; Fc GRAVEL, some Fine Sand; abundant bricks; loose; saturated; NAPL present (23.0-23.5)		GW SM/SC	
2891	2325			3				
				2	Olive Gray; F SAND, little Silt/Clay; loose; saturated; product present (23.5-23.8)			
		25		5				
122			45	2	Olive Gray to Brn; Fm SAND, trace F. Gravel; micaceous grains; loose; saturated; NAPL present.		SP	
136				2				
				2				
		27		2				
796			25	3	Brn; m SAND, little Fc Gravel; loose; saturated; amber NAPL present.		SP	
				4				
				3				
		29		1				
			0	WOR	No Recovery		NR	
				WOR				
				WOR				
		31		WOR				
			0	WOR	No Recovery		NR	
				WOR				
				WOR				
		33		WOR				
112			10	3	Olive Gray; Fm SAND, trace Fc Gravel; micaceous grains; very loose; saturated; irridescent NAPL product present.		SP	
				2				
				1				
		35		1				
				WOR	Augered to 38 feet			
				WOR				
				WOR				
				WOR				
				WOR				
		38		WOR				
101			100	1	Brn; F SAND, trace F Gravel; very loose; saturated (38.0-38.7).		SP	
227		39		1	Lt Brn; CEMENT; very soft (38.7-39.0).		Cement	
				100/0"	Total Depth = 39 Feet.			
		40						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Bailer Blow

COMMENTS:

FIGURE 4.2

Contractor: ADT Driller: Victor Champagne Inspector: Mike Wilkinson Rig Type: CME LC-60 Method: HSA					DRILLING RECORD PROJECT NAME Con Edison W 45th St. Works PROJECT NUMBER 440090		BORING/ WELL NO. MW-4 Sheet 1 of 1 Location Description:	
GROUNDWATER OBSERVATIONS Water Level Date Time Meas. From					Weather Clear, 45°F Date/Time Start 4-21-03, 0930 Date/Time Finish 4-21-03, 1030		Location Plan See Site Plan	
PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL		LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0							
		2			Augered to 5 feet. Cuttings: Lt Brn; fmc SAND; some Silt; wet.				
		4							
0		6	10	2 2 3 3	Lt Brn; fmc SAND, little Silt; trace F. Gravel; loose; saturated.			SM	
9		8	25	3 4 4 3	Olive Gray; SILT, little f. Sand; loose; saturated.			ML	
70 17	MW4-0911	10	40	2 2 3 2	Olive Gray; SILT; with amber NAPL film; med. stiff; saturated (9.0-9.7). Black; fm SAND, trace F. Gravel; loose; saturated (9.7-9.8).			ML SP	
13		12	30	2 2 1 1	Olive Gray; SILT; with amber NAPL film; soft; saturated (11.0-11.5). Black; fmc SAND, trace f. Gravel; with cinder fragments; very loose; saturated (11.5-11.6)			ML SM	
2		14	5	1 3 1 1	Olive Gray; f. SAND, trace mc Sand, trace F. Gravel; loose; saturated.			SP	
		16			Total Depth = 15 feet.				
		18							
		20							

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: MW-5
Sheet: 1 of 1
Location Description:

Weather: Clear, 45°F
Date/Time Start: 4-21-03, 0800
Date/Time Finish: 4-21-03, 0925

Location Plan: See Site Plan

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
		2			Augered to 5 Feet. Cuttings: Lt Brn; fmc SAND, little Silt/Clay, little fc Gravel; saturated		SM/SC	
		4						
0.4			45	3	Olive Gray; SILT, some fm Sand, little fc Gravel; stiff; saturated		ML	
0.3		6		8				
				4				
				3				
1			45	2	Olive Gray; fm SAND, and Silt, trace fc Gravel; micaceous grains and glass present; loose; saturated (7.0-7.6).		SM	
0		8		2	Lt Brn; SILT, little fm Sand; soft; saturated (7.6-7.9).		ML	
				2				
			0	1	No Recovery, rock in tip of spoon.		NR	
		10		1				
				7				
				2				
54	MW5-1113		40	1	Olive Gray; SILT, little fmc Sand, trace f. Gravel; with black motor oil-like NAPL; soft; saturated.		ML	
5		12		1				
				2				
				3				
			0	9	No Recovery, wood in tip of spoon.		NR	
		14		6				
				1				
				1				
		16			Total Depth = 15 Feet.			
		18						
		20						

STANDARD PENETRATION TEST

SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

FIGURE 4.2

Contractor: ADT
Driller: Victor Champagne
Inspector: Mike Wilkinson
Rig Type: CME LC-60
Method: HSA

DRILLING RECORD

PROJECT NAME: Con Edison W 45th St. Works
PROJECT NUMBER: 440090

BORING/WELL NO.: MW-6
Sheet: 1 of 1
Location Description:

GROUNDWATER OBSERVATIONS

Water Level				
Date				
Time				
Meas. From				

Weather: Partly Sunny, 46°F
Date/Time Start: 4-17-03, 1340
Date/Time Finish: 4-17-03, 1500

Location Plan: See Site Plan

PID Reading	Sample I.D.	Sample Depth	Percent Recovery	Blow Cts	FIELD IDENTIFICATION OF MATERIAL	LITHOLOGIC SCHEMATIC	SOIL CLASSIF	COMMENTS
		0						
		2			Augered to 5 Feet. Cuttings: Dk Brn; fmc. SAND, trace Clay; saturated			
		4						
6			40	1	Lt Brn to Dk Brn; F. SAND, trace Clay/Silt, little f. Gravel; loose; saturated; ~~NAPL odor present~~ H2O		SP	
1		6		2				
				1				
				1				
19			75	2	Olive Gray; F. SAND, little fe Gravel, trace Clay/Silt; loose; saturated; NAPL odor present.		SP	
23		8		3				
13				3				
				3				
			0	3	No Recovery, NAPL coated rock in tip of spoon.		NR	
		10		3				
				3				
				5				
27			50	2	Dk Gray to Dk Brn; F. SAND, little fe Gravel; with black motor oil-like NAPL; medium dense; saturated (11.0-11.7).		SP	
30		12		11			SCHIST	
				6				
				4	~~dense~~ Olive Gray; SCHIST, weathered (11.7-12.0).			
		14			Augered to 14 feet			
					Total Depth = 14 Feet.			
		16						
		18						
		20						

STANDARD PENETRATION TEST
SS = SPLIT SPOON
A = AUGER CUTTINGS
C = CORED
WOR = Weight of Rod
WOH = Weight of Hammer
RB = Roller Bit

COMMENTS

APPENDIX E
BENCH SCALE ISS TREATABILITY REPORT

Geo-Solutions
Soil and Groundwater Problems Solved

1250 Fifth Avenue, New Kensington, PA 15068
T 724-335-7273 **F** 724-335-7271
www.geo-solutions.com

Sent via email to: Keith.Parker@parsons.com

June 6, 2023

Parsons
100 High Street 4th Floor
Boston, MA 02110
Attn: Keith Parker
Phone: (978) 604-1846

21-054

SUBJECT: BENCH SCALE TREATABILITY STUDY REPORT
MGP IMPACTED SITE REMEDIATION
MANHATTAN, NY

Keith,

In accordance with Geo-Solutions, Inc.'s (GSI) Laboratory Testing Proposal for the above referenced project, GSI has completed multiple phases of a bench scale treatability study to evaluate, test, and report on potential *in-situ* stabilization / solidification (ISS) mixes for use at this site. This letter report summarizes the results of the work.

Materials

The materials used in the ISS bench scale treatability study are summarized on Table 1.

Table 1. Phase I Material Type and Source

Material	Type	Soil Boring ID and Depth Interval	Abbreviation
Site Soils	Underlying Sand	SPDI-1 (15-20')	SPDI-1
	Underlying Sand	SPDI-2 (18-20')	SPDI-2
	Underlying Sand	SPDI-3 (5-15')	SPDI-3
	NAPL saturated Sand	SPDI-5 (18-20')	SPDI-5
	Overlying Fill	SPDI-6 (10-16')	SPDI-6
Water	Municipal Water	Pittsburgh Municipal Water	W
Water	Groundwater	MW - 21	GW
Cement	Type IL Portland Cement	Lafarge	PC
Slag	Grade 100 Blast-Furnace Slag	Lafarge	BFS

Study Objectives

The study objectives were developed to find a mixture of site soils and reagents that can achieve the ISS remedial objectives of creating a monolith of reduced the hydraulic conductivity (below 1 $x10^{-6}$ cm/s) and moderate compressive strength (approximately 50 psi). In order to accomplish this overall objective, GSI established the following sub objectives:

- Select commercially available reagents (e.g. Portland cement, blast-furnace slag) that are suitable for use in the ISS project and available at the project site in the quantities required for the full-scale work.

- Develop a mixture of site soils and reagents that achieves a hydraulic conductivity of approximately $5x10^{-7}$ cm/s or less in order to provide roughly a half an order of magnitude factor of safety to achieve a field hydraulic conductivity of less than $1x10^{-6}$ cm/s.
- Develop a mixture of site soils and reagents that achieves an unconfined compressive strength (UCS) of approximately 100 psi or more in order to provide roughly a factor of safety of 2 to achieve a field UCS of greater than 50 psi.

Sample Information

Five different site soil samples and one groundwater sample, as identified in Table 1, were received by JLT Laboratories in October 2022 for use in the treatability study testing.

Soil Index Testing

After the samples were received, each soil source was homogenized and a grab sample of each was subjected to soil index testing. The results of the soil index testing are summarized on Table 2. Laboratory data reports to support the information presented on Table 2 are attached to this letter.

Table 2. Soil Index Test Results

Soil Sample ID	pH	Fines Content %	Organic Content %	Moisture Content %	Single Pt Proctor – dry (pcf)	Single Pt Proctor – wet (pcf)
SPDI-1	8.2	20.7%	0.7%	13.4%	131.0	143.0
SPDI-2	10.5	32.1%	1.6%	17.7%	111.8	130.8
SPDI-3	9.3	20.2%	1.8%	18.9%	115.8	130.1
SPDI-5	11.1	11.4%	1.8%	24.6%	113.7	132.2
SPDI-6	10.4	26.0%	1.9%	16.4%	119.3	134.8

Based on the Index Testing and Analytical results, GSI and Parsons agreed to keep each soil location separated and test them independently. Due to the variability in soil volume from each location, GSI and Parsons agreed to do a screening level step to define the appropriate reagent addition range using the location with the greatest volume of soil, SDPI-3.

Soil-Grout Mixtures

Using the results of the soil index testing and past experience, GSI selected and created mixtures of the site soils and reagents. The soil-grout mixtures were created using methods that mimic an ISS field mixing process. The general procedure is described below:

1. Run soil composite through a 12.7mm (0.5 inch) sieve to remove large pieces of gravel or clods of soil that would have an unrepresentatively large impact on the behavior of the relatively small, 51 mm (2 inch) and 76 mm (3 inch), diameter laboratory samples
2. Weigh appropriate amount of soil composite, generally between 2,000 and 5,000 g.
3. Mix grout consisting of predetermined amounts of water and reagents. Reagent addition rates are based on experience with treating similar soil types/contaminants.
    a. Test grout for marsh funnel viscosity, density, pH and temperature
4. Add grout to soil composite until workable condition is achieved. Assess workable condition using experience and visual indicators (generally consistent with a slump of 100 – 180 mm (4” – 7))
5. Mix until visually homogeneous.

6. Place mix into 2x4" and 3x6" testing cylinders in a manner that limits air entrapment (e.g. see Andromalos et al 2015).

A summary of the composition of the screening mixes along with the grout properties and slump is included on Table 3.

Table 3. Screening Level Soil-Grout Mixes

Mix ID	Soil	Mix Type	PC	BFS	W:C	Grout: Soil*	Grout Properties			
							Viscosity (s)	Density (pcf)	Temp (F)	pH
M-3-1	SPDI-3	Soil-Mix	2.0%	4.0%	2.00	-	28	80	68	12
M-3-2	SPDI-3	Soil-Mix	3.0%	6.0%	1.50	-	29	85	68	12
M-3-3	SPDI-3	Soil-Mix	4.0%	8.0%	1.00	-	30	94	68	12
M-3-4	SPDI-3	Soil-Mix	9.0%	0.0%	1.50	-	30	86	68	12
M-3-5	SPDI-3	Jet-Grout	18%	-	1.00	0.50	30	95	68	12
M-3-6	SPDI-3	Jet-Grout	27%	-	1.00	0.75	30	95	68	12
M-3-7	SPDI-3	Jet-Grout	36%	-	1.00	1.00	30	95	68	12
M-3-8	SPDI-3	Jet-Grout	23%	-	1.25	0.75	29	90	68	12

Reagent percentages based on reagent weight to soil weight (wet)
*For Jet-Grouting mixes only, based on standard flow, rotation, and withdrawal rates

After samples had taken their initial set, specimens of each mixture were taken to a geotechnical laboratory for hydraulic conductivity and UCS testing. The results of this testing are summarized on Table 4. Laboratory data sheets to support Table 4 are included in an attachment to this letter.

Table 4. UCS and Hydraulic Conductivity Test Result Summary

Mix ID	Soil	Mix Type	PC	BFS	Pocket Penetrometer (psi)			UCS (psi)		Hydraulic Conductivity (cm/s)
					1 Day	3 Day	7 Day	7 Day	14 Day	7 Day
M-3-1	SPDI-3	Soil-Mix	2.0%	4.0%	28	63	>63	54	102	$7.9x10^{-7}$
M-3-2	SPDI-3	Soil-Mix	3.0%	6.0%	52	>63	>63	95	167	$6.8x10^{-7}$
M-3-3	SPDI-3	Soil-Mix	4.0%	8.0%	>63	>63	>63	171	326	$2.3x10^{-7}$
M-3-4	SPDI-3	Soil-Mix	9.0%	0.0%	>63	>63	>63	115	136	$5.6x10^{-7}$
M-3-5	SPDI-3	Jet-Grout	18%	-	>63	>63	>63	274	311	$2.2x10^{-7}$
M-3-6	SPDI-3	Jet-Grout	27%	-	>63	>63	>63	246	270	$1.5x10^{-7}$
M-3-7	SPDI-3	Jet-Grout	36%	-	>63	>63	>63	332	304	$1.3x10^{-7}$
M-3-8	SPDI-3	Jet-Grout	23%	-	>63	>63	>63	85	97	$5.7x10^{-6}$

Round 1 Results Discussions

Based on the first round of mixes, the following conclusions can be made:

- The first round of mixes suggested that a cement addition rate between 6% and 9% total cementitious would meet all the mix design targets for soil-mixing applications.
- Strength development should not be a concern for addition rates between 6% and 9% total cementitious and hydraulic conductivity will be the controlling property for the soil-mix mix selection.
- The mix containing slag-cement outperformed the equivalent mix using only Portland cement at early testing and would be expected to continue to approve over time more than the Portland cement only mix.

- The first round of mixes suggested that jet-grouting using a 1:1 water to cement ratio grout within typical ranges of withdrawal rates, flow, and rotation would meet the strength and hydraulic conductivity targets.
- Mixes M-3-1 through M-3-7 either met the hydraulic conductivity target of $5x10^{-7}$ cm/s would be assumed to with additional curing time.
- The 1.25 W:C ratio grout (M-3-8) did not meet the hydraulic conductivity target at 7-day testing. While it may meet the target at longer curing dates, additional testing would be required prior to implementing in the field.

Based on the results of this initial phase of testing, GSI and Parsons concluded that further testing should focus on Mixes 1, 2, 5, and 7 for all of the soil types.

Round 2 Mixture Evaluation

Since the geotechnical objectives were effectively bracketed with the Round 1 ISS mixtures, the Round 2 mixtures were structured to focus applying the same mixes to the other soil locations. A summary of the composition of the Round 2 mixes along with the grout properties and slump is included on Table 5.

Table 5. Round 2 Soil-Grout Mixes

Mix ID	Soil	Mix Type	PC	BFS	W:C	Grout: Soil*	Grout Properties			
							Viscosity (s)	Density (pcf)	Temp (F)	pH
M-1-1	SPDI-1	Soil-Mix	2%	4%	2.00	-	28	80	68	12
M-1-2	SPDI-1	Soil-Mix	3%	6%	1.50	-	29	85	68	12
M-1-5	SPDI-1	Jet-Grout	18%	-	1.00	0.50	30	95	68	12
M-1-7	SPDI-1	Jet-Grout	36%	-	1.00	1.00	30	95	68	12
M-2-1	SPDI-2	Soil-Mix	2%	4%	2.00	-	28	80	68	12
M-2-2	SPDI-2	Soil-Mix	3%	6%	1.50	-	29	85	68	12
M-2-5	SPDI-2	Jet-Grout	18%	-	1.00	0.50	30	95	68	12
M-2-7	SPDI-2	Jet-Grout	36%	-	1.00	1.00	30	95	68	12
M-3-1	SPDI-3	Soil-Mix	2%	4%	2.00	-	28	80	68	12
M-3-2	SPDI-3	Soil-Mix	3%	6%	1.50	-	29	85	68	12
M-3-5	SPDI-3	Jet-Grout	18%	-	1.00	0.50	30	95	68	12
M-3-7	SPDI-3	Jet-Grout	36%	-	1.00	1.00	30	95	68	12
M-5-1	SPDI-5	Soil-Mix	2%	4%	2.00	-	28	80	68	12
M-5-2	SPDI-5	Soil-Mix	3%	6%	1.50	-	29	85	68	12
M-6-1	SPDI-6	Soil-Mix	2%	4%	2.00	-	28	80	68	12
M-6-2	SPDI-6	Soil-Mix	3%	6%	1.50	-	29	85	68	12

Reagent percentages based on reagent weight to soil weight (wet)
*For Jet-Grouting mixes only, based on standard flow, rotation, and withdrawal rates

After samples had taken their initial set, specimens of each mixture were taken to a geotechnical laboratory for hydraulic conductivity and UCS testing. The results of this testing are summarized on Table 6. Laboratory data sheets to support Table 6 are included in an attachment to this letter.

Table 6. UCS and Hydraulic Conductivity Test Result Summary

Mix ID	Soil	Mix Type	PC	BFS	Pocket Penetrometer (psi)			UCS (psi)			Hydraulic Conductivity (cm/s)	
					1 Day	3 Day	7 Day	7 Day	14 Day	28 Day	14 Day	28 Day
M-1-1	SPDI-1	Soil-Mix	2%	4%	-	>63	>63	54	108	147	$6.6x10^{-7}$	$8.0x10^{-7}$
M-1-2	SPDI-1	Soil-Mix	3%	6%	-	>63	>63	86	168	230	$3.6x10^{-7}$	$9.8x10^{-8}$
M-1-5	SPDI-1	Jet-Grout	18%	-	-	>63	>63	287	367	347	$3.7x10^{-7}$	$2.0x10^{-7}$
M-1-7	SPDI-1	Jet-Grout	36%	-	-	>63	>63	405	417	581	$9.1x10^{-8}$	$5.0x10^{-8}$
M-2-1	SPDI-2	Soil-Mix	2%	4%	-	>63	>63	261	326	426	$1.9x10^{-7}$	$6.8x10^{-9}$
M-2-2	SPDI-2	Soil-Mix	3%	6%	-	>63	>63	335	481	539	$1.6x10^{-9}$	$4.5x10^{-9}$
M-2-5	SPDI-2	Jet-Grout	18%	-	-	>63	>63	485	731	893	$2.6x10^{-8}$	$8.1x10^{-8}$
M-2-7	SPDI-2	Jet-Grout	36%	-	-	>63	>63	602	757	845	$8.9x10^{-8}$	$9.5x10^{-8}$
M-3-1	SPDI-3	Soil-Mix	2%	4%	21	-	>63	57	95	183	$2.2x10^{-7}$	$8.1x10^{-8}$
M-3-2	SPDI-3	Soil-Mix	3%	6%	24	-	>63	62	137	225	$2.9x10^{-7}$	$5.2x10^{-8}$
M-3-5	SPDI-3	Jet-Grout	18%	-	>63	-	>63	229	300	295	$9.4x10^{-8}$	$1.1x10^{-7}$
M-3-7	SPDI-3	Jet-Grout	36%	-	>63	-	>63	321	382	396	$6.1x10^{-8}$	$3.8x10^{-8}$
M-5-1	SPDI-5	Soil-Mix	2%	4%	52	-	>63	110	173	258	$1.4x10^{-8}$	$2.8x10^{-8}$
M-5-2	SPDI-5	Soil-Mix	3%	6%	63	-	>63	173	259	399	$3.1x10^{-8}$	$3.8x10^{-8}$
M-6-1	SPDI-6	Soil-Mix	2%	4%	42	-	>63	75	162	229	$4.5x10^{-8}$	$9.3x10^{-8}$
M-6-2	SPDI-6	Soil-Mix	3%	6%	42	-	>63	130	248	358	$1.1x10^{-8}$	$1.6x10^{-8}$

Sample cylinders from each mix the 2nd round or mixes were transferred to Parsons custody via Eurofins for the purpose of completing SPLP testing and cylinders from M-3-1, M-3-2, M-3-5, M-3-7, M-5-1, and M-5-2 were transferred for LEAF testing. The results from this testing will be reported under a separate cover.

In addition to the geotechnical testing, GSI conducted a modified slake immersion test. Slake immersion testing was performed to provide a visual indication of the compatibility of the sample(s) exposed to site groundwater. For mix from the round 2 mixes, one mold from each sample set was weighed and placed in a glass jar filled with tap water, and a second mold was placed in a glass jar filled with site groundwater. All samples were allowed to sit undisturbed for 105 days. After the samples were allowed to soak in the respective environments, they were photographed and removed from the jars to be towel dried and weighed for comparison to the day 0 weights. The approach used is considered to be aggressive based on the amount of impacted groundwater in direct contact with a large portion of the sample area. In-field exposure would be significantly reduced and occur over a longer period of time. The images and results of the testing can be found below in Figures 1 through 8 and Table 7 respectively.

Geo-Solutions
Soil and Groundwater Problems Solved



Figure 1. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 2. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 3. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 4. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 5. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 6. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 7. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)



Figure 8. Slake Immersion Test Samples – Day 0 (top) and Day 105 (bottom)

Table 7. Slake Immersion testing – before/after sample weights

Mix ID	Tap Water		Groundwater	
	Day 0 Weight (g)	Day 105 Weight (g)	Day 0 Weight (g)	Day 105 Weight (g)
M-1-1	410	410	412	412
M-1-2	402	402	404	404
M-1-5	403	403	401	401
M-1-7	374	374	374	374
M-2-1	404	404	404	404
M-2-2	402	402	403	403
M-2-5	400	400	402	402
M-2-7	375	375	385	385
M-3-1	393	393	391	391
M-3-2	391	391	391	391
M-3-5	393	393	394	394
M-3-7	370	370	371	371
M-5-1	387	388	389	390
M-5-2	384	385	386	386
M-6-1	395	395	400	400
M-6-2	400	400	399	400

Visually, there was no evidence of a detrimental impact on the samples immersed in the site groundwater. Visual indicators typically include spalling, cracking, changes in surface texture, etc. of which none of the samples immersed in groundwater exhibited. During the process of removing the samples from the jars and towel drying, there was no noticeable physical difference in the groundwater samples relative to the companion tap water samples. The day 0 vs day 105 weights also quantifiably indicate that there was no impact resulting in mass loss of the samples such as spalling or degradation.

Round 2 Results Discussions

Based on the second round of mixes, the following conclusions can be made:

- The soil-mixing mixes containing 6% and 9% total cementitious at a 2:1 slag/Portland ratio met the mix design objectives for UCS, including the target factor of safety, for all soil types.
- The soil-mixing mixes containing 6% and 9% total cementitious at a 2:1 slag/Portland ratio met the mix design objectives for hydraulic conductivity for all soil types, including the target factor of safety, except for M-1-1 which met the base target but not the target factor of safety.
- The jet-grouting mixes between a 0.5 to 1.0 grout to soil ratio met the mix design objectives for UCS and hydraulic conductivity, including the target factor of safety, for all soil types.
- Strength development was again shown to not be a concern for these addition rates and hydraulic conductivity continues to be the controlling property for mix selection.
- Based on the observations from the slake immersion testing, it does not appear that the site groundwater has a significant impact on the durability of any of the mixes.

Summary Conclusions

The following conclusions were made from this completed bench scale study:

- Commercially available reagents were successful in achieving standard UCS and hydraulic conductivity objectives for ISS mixes, via soil mixing and jet-grouting, with the site soils.
- Based on the results of this study, a 6% total cement addition using a slag to Portland ratio of 2:1, by weight of soil, can achieve the UCS and hydraulic conductivity objectives with a typical factor of safety for all soil types except SPDI 1. With the improvement of slag mixes with time, it is possible that later testing would show the factor of safety being met for M-1-1 as well.
- The slake immersion results showed no visual evidence of a significant impact on durability of the samples from the site groundwater.

Sincerely,

Geo-Solutions, Inc.



Nathan Coughenour, P.E.
Project Manager

Attachments:

- Laboratory Data Sheets

JLT Laboratories, Inc.
Geotechnical, Geosynthetic and Materials Testing and Research

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www.jltlabs.com

October 26, 2022
22LS4035

GeoSolutions
Manhatten, NY
(GeoSolutions Project No: 21-054)

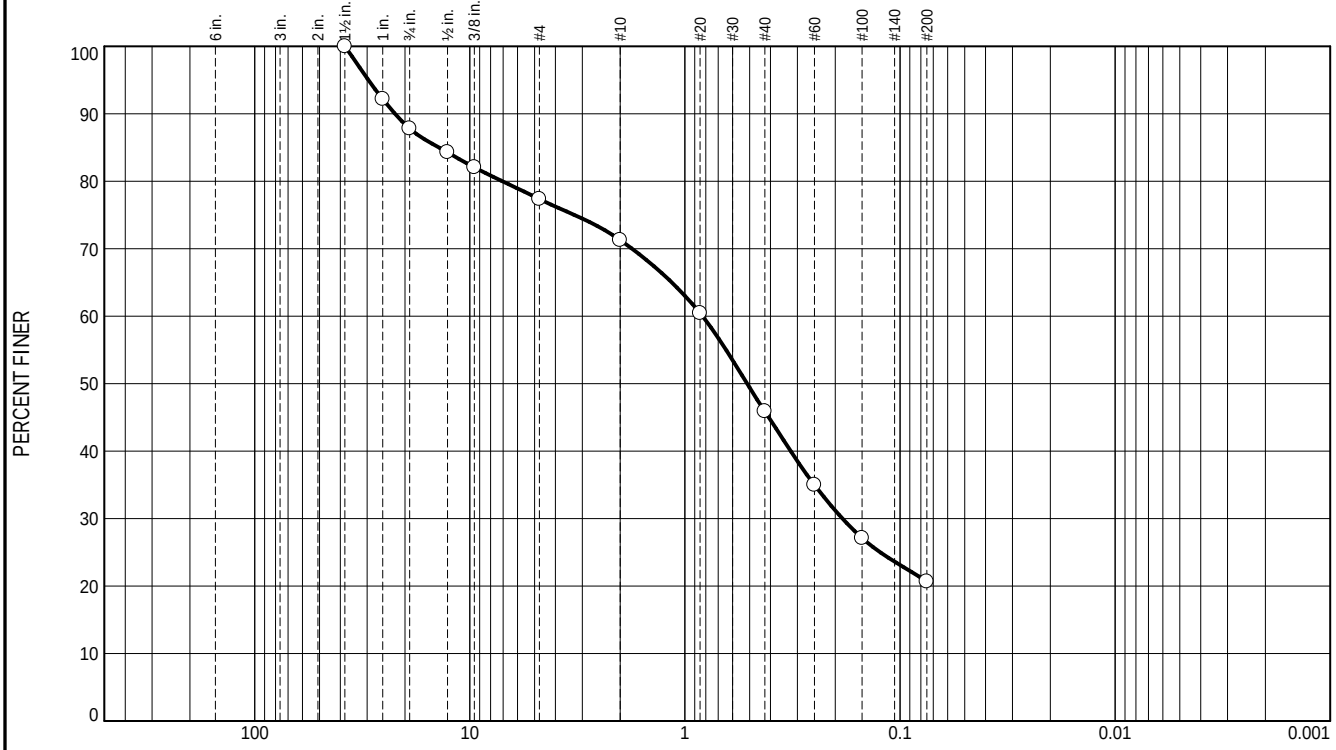
Water Testing

Water ID	pH	TDS	Hardness
MW-21	7.5	889 ppm	250 ppm

Enclosures
JB\mlb
MSWord\misc\2254

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	10.4	6.1	25.4	25.2	20.7	

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
1.50	100.0			
1.00	92.2			
0.75	87.8			
0.50	84.3			
0.375	82.1			
#4	77.4			
#10	71.3			
#20	60.5			
#40	45.9			
#60	35.0			
#100	27.1			
#200	20.7			

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 22.2600 D_{85}= 13.8697 D_{60}= 0.8278
D_{50}= 0.5135 D_{30}= 0.1851 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

As-Rec'd M/C = 13.36%
Organic Content = 0.69%
pH = 8.2

Location: Manhatten, NY
Sample Number: SPDI-1

Sample Date:

JLT Laboratories, Inc.

Canonsburg, PA

Client: GeoSolutions
Project: Manhatten, NY
21-054
Project No: 22LS4035

Figure

Tested By: AE

Checked By: JB

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.9	12.8	6.2	15.3	21.7	32.1	

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
1.50	100.0			
1.00	90.8			
0.75	88.1			
0.50	83.3			
0.375	80.6			
#4	75.3			
#10	69.1			
#20	63.5			
#40	53.8			
#60	41.6			
#100	36.6			
#200	32.1			

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 24.0263 D_{85}= 14.7237 D_{60}= 0.6287
D_{50}= 0.3582 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

As-Rec'd M/C = 17.68%
Organic Content = 1.63%
pH = 10.5

Location: Manhatten, NY
Sample Number: SPDI-2

Sample Date:

JLT Laboratories, Inc.

Canonsburg, PA

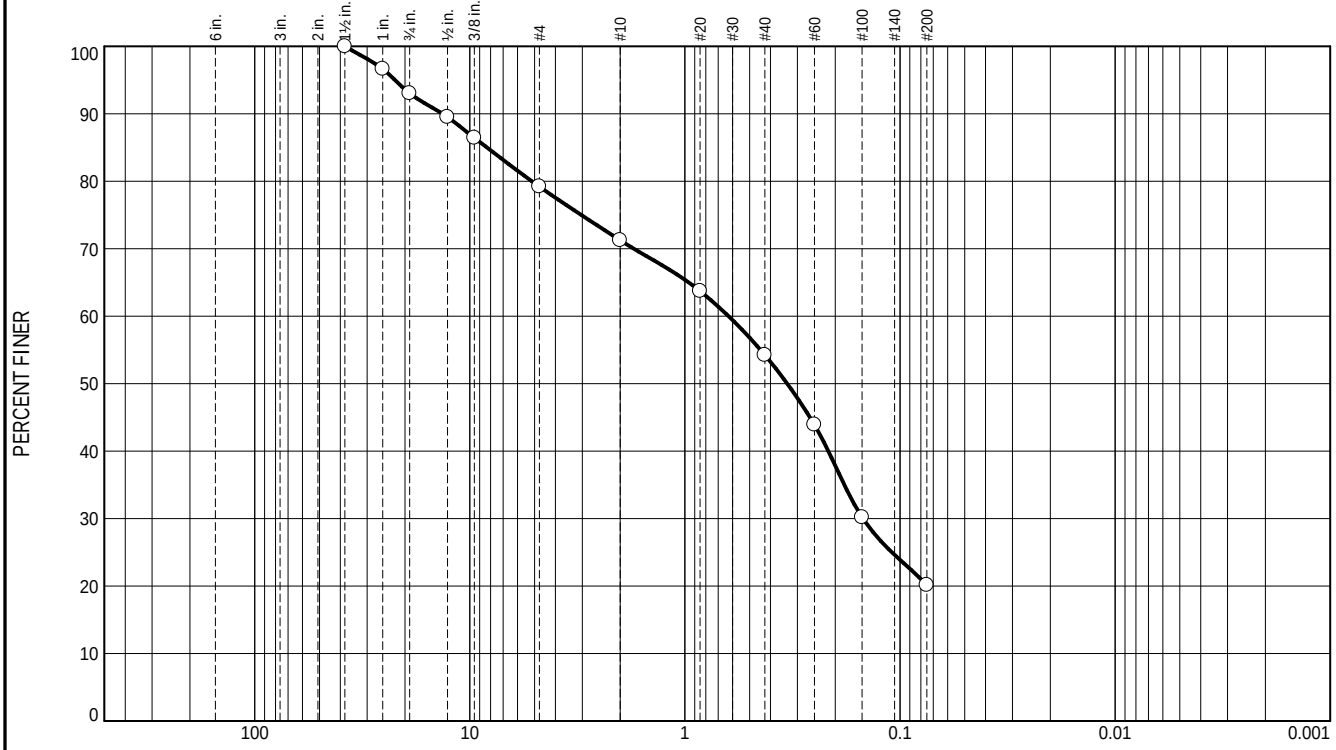
Client: GeoSolutions
Project: Manhatten, NY
21-054
Project No: 22LS4035

Figure

Tested By: AE Checked By: JB

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.0	13.8	7.9	17.0	34.1	20.2	

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
1.50	100.0			
1.00	96.7			
0.75	93.0			
0.50	89.5			
0.375	86.4			
#4	79.2			
#10	71.3			
#20	63.7			
#40	54.3			
#60	43.9			
#100	30.2			
#200	20.2			

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 13.3611 D_{85}= 8.3186 D_{60}= 0.6263
D_{50}= 0.3342 D_{30}= 0.1486 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

As-Rec'd M/C = 18.92%
Organic Content = 1.79%
pH = 9.3

Location: Manhatten, NY
Sample Number: SPDI-3

Sample Date:

JLT Laboratories, Inc.

Canonsburg, PA

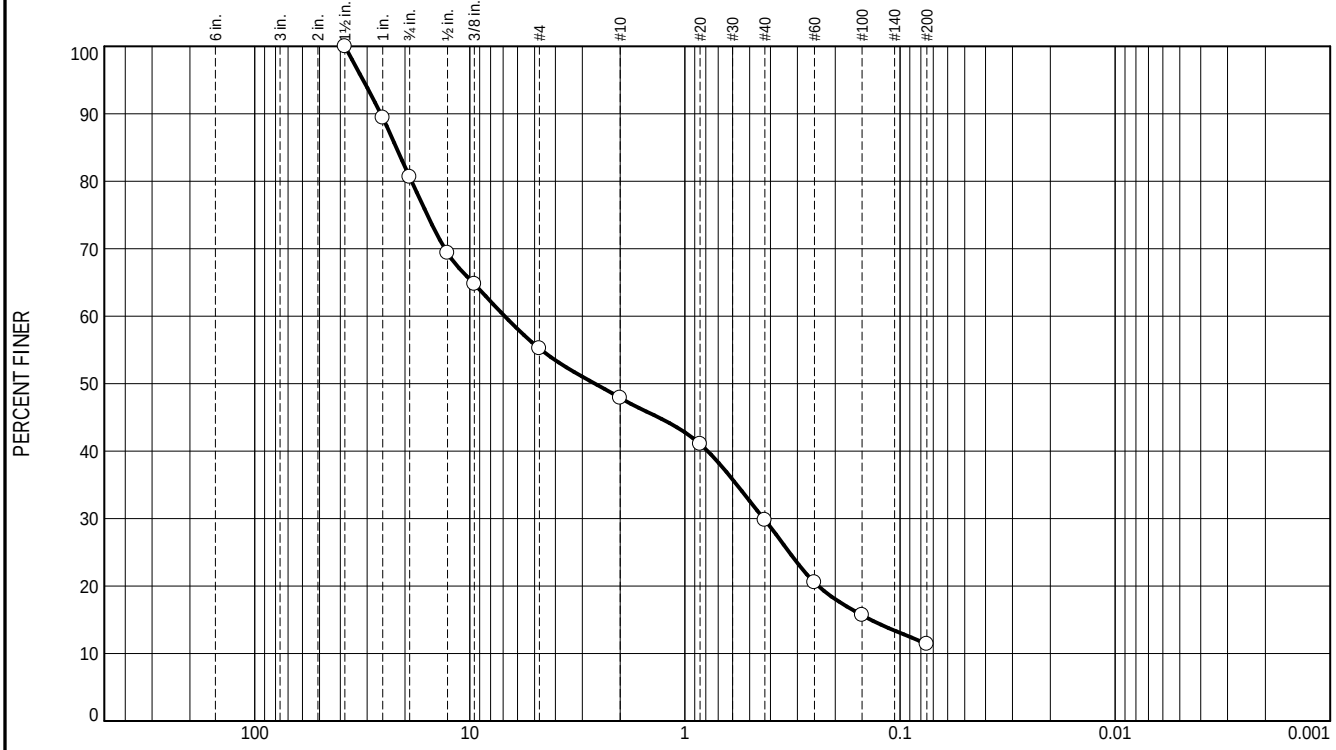
Client: GeoSolutions
Project: Manhatten, NY
21-054
Project No: 22LS4035

Figure

Tested By: AE Checked By: JB

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	19.4	25.4	7.3	18.1	18.4	11.4	

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
1.50	100.0			
1.00	89.4			
0.75	80.6			
0.50	69.4			
0.375	64.8			
#4	55.2			
#10	47.9			
#20	41.1			
#40	29.8			
#60	20.5			
#100	15.7			
#200	11.4			

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 25.9287 D_{85}= 21.9528 D_{60}= 6.8836
D_{50}= 2.6199 D_{30}= 0.4304 D_{15}= 0.1367
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

As-Rec'd M/C = 24.57%
Organic Content = 1.79%
pH = 11.1

Location: Manhatten, NY
Sample Number: SPDI-5

Sample Date:

JLT Laboratories, Inc.

Canonsburg, PA

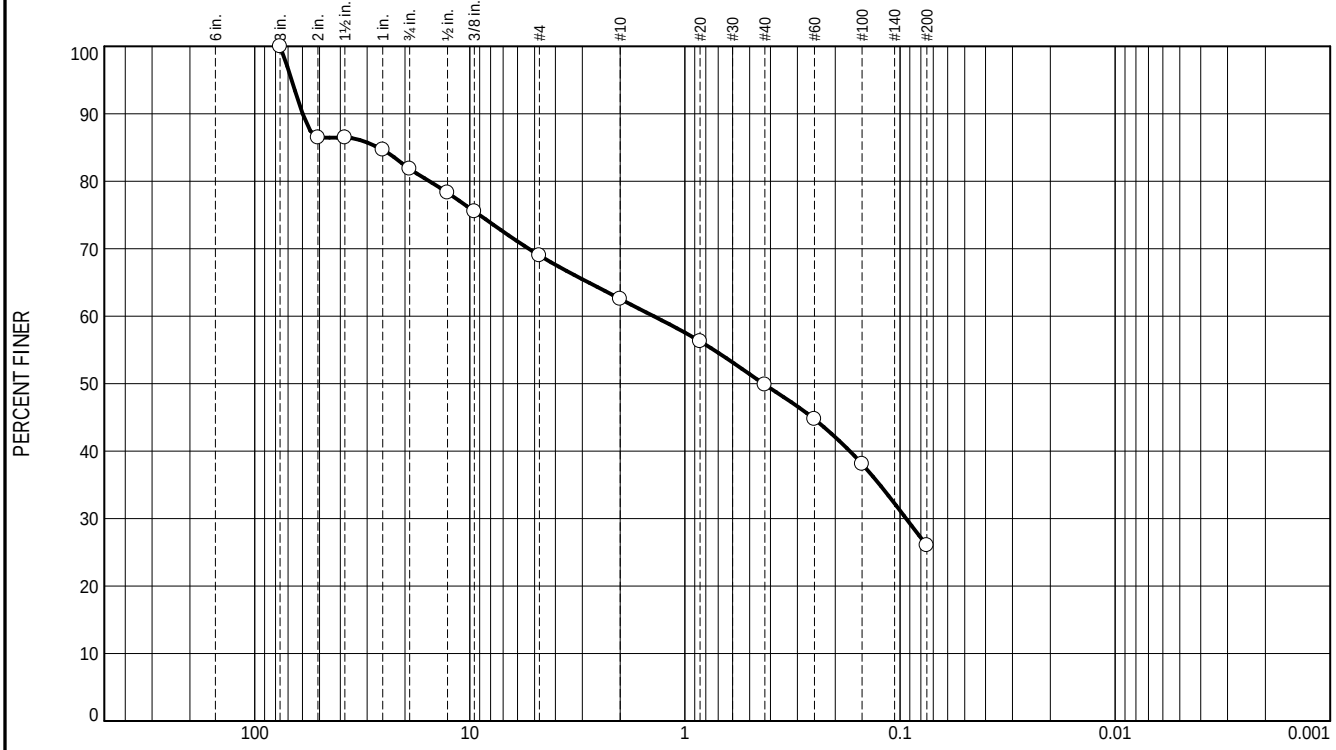
Client: GeoSolutions
Project: Manhatten, NY
21-054
Project No: 22LS4035

Figure

Tested By: AE Checked By: JB

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.2	12.8	6.4	12.7	23.9	26.0	

Test Results (ASTM D422)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
3.00	100.0			
2.00	86.5			
1.50	86.5			
1.00	84.7			
0.75	81.8			
0.50	78.3			
0.375	75.5			
#4	69.0			
#10	62.6			
#20	56.3			
#40	49.9			
#60	44.7			
#100	38.1			
#200	26.0			

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 59.8441 D_{85}= 26.5864 D_{60}= 1.3953
D_{50}= 0.4314 D_{30}= 0.0936 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

As-Rec'd M/C = 16.40%
Organic Content = 1.87%
pH = 10.4

Location: Manhatten, NY
Sample Number: SPDI-6

Sample Date:

JLT Laboratories, Inc.

Canonsburg, PA

Client: GeoSolutions
Project: Manhatten, NY
21-054
Project No: 22LS4035

Figure

Tested By: AE Checked By: JB

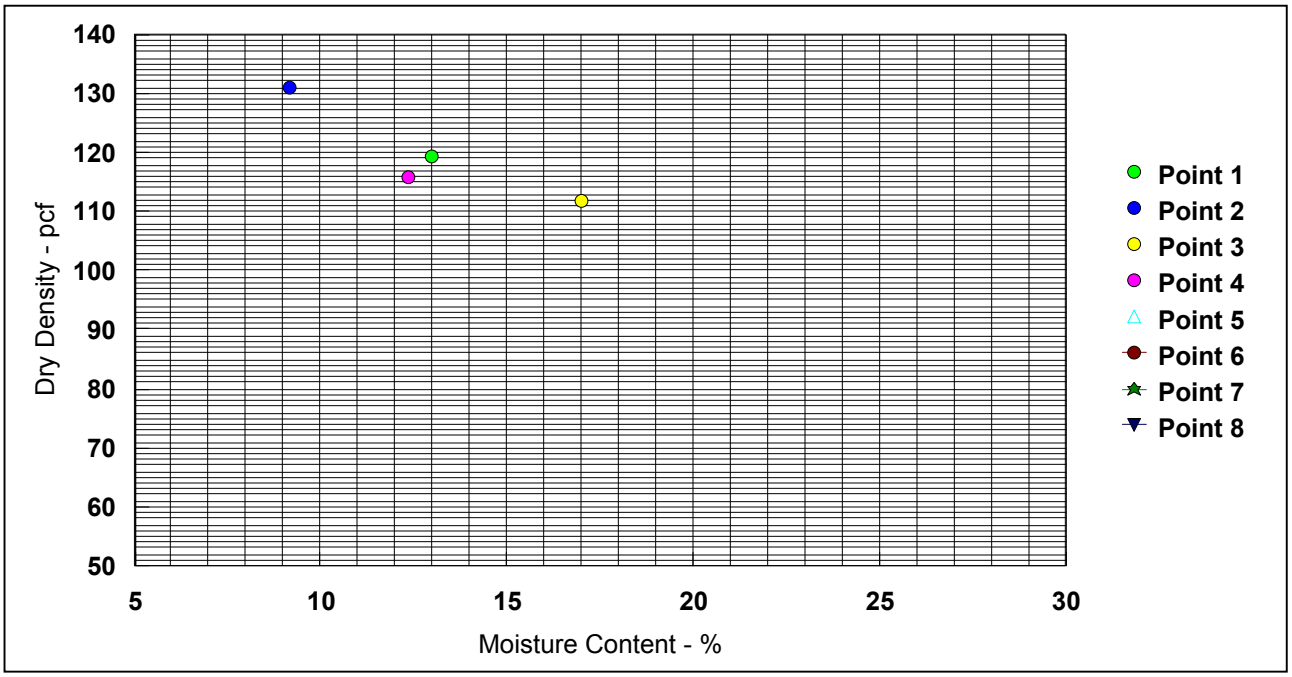
COMPACTION TEST REPORT

CLIENT : GeoSolutions, Inc
PROJECT : Manatten, NY
MATERIAL : Bag Samples

JOB NO 22LS4035
DATE 10/28/2022
Tested By TM
Calc 'd By JBJr.

	ASTM	Mold	Hammer	Drop	Layers	Rock Cor.	Technique	Calibration
METHOD	D698-A	4"	5.5 lbs	12"	3/25	No	Auto Hammer	10-15-22

	SPDI-6	SPDI-1	SPDI-2	SPDI-3
	1	2	3	4
MOLD+WETSOIL, gr	6324	6448	6264	6253
MOLD, gr	4284	4284	4284	4284
WET SOIL, gr	2040	2164	1980	1969
WET DENSITY, pcf	134.80	143.00	130.84	130.11
Tare ID	B54	B33	X708	B-9
WET + TARE, gr	2145.6	2262.7	2082.2	2073.5
DRY + TARE, gr	1910.6	2080.7	1794.3	1856.5
TARE, gr	101.8	96.3	101.8	101.2
DRY SOIL, gr	1808.8	1984.4	1692.5	1755.3
WATER, gr	235	182	287.9	217
MOISTURE	0.130	0.092	0.170	0.124
MOISTURE, %	**12.99**	**9.17**	**17.01**	**12.36**
DRY DENSITY, pcf	**119.30**	**130.98**	**111.82**	**115.79**



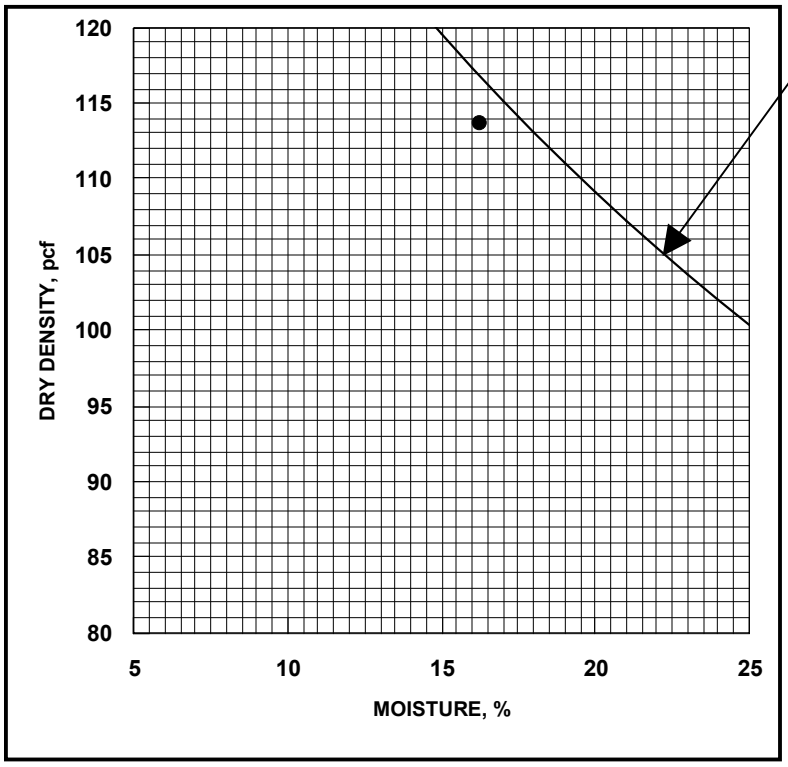
JLT Laboratories, Inc.

COMPACTION TEST REPORT

CLIENT :	GeoSolutions	JOB NO	22ILS4035
PROJECT :	Manhatten, NY	DATE	10/28/2022
MATERIAL :	SPDI-5	Tested By	ML
		Calc 'd By	JBJr.

	ASTM	Mold	Hammer	Drop	Layers	Rock Cor.	Technique	Calib Check
METHOD	D698	6"	5.5 lbs	12"	3/56	No	Auto Hammer	10-15-22

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	10168							
MOLD, gr	5667							
WET SOIL, gr	4501							
WET DENSITY, pcf	132.19							
Tare ID	B10							
WET + TARE, gr	2429.7							
DRY + TARE, gr	2104.9							
TARE, gr	102.9							
DRY SOIL, gr	2002							
WATER, gr	324.8							
MOISTURE	0.162							
MOISTURE, %	**16.22**							
DRY DENSITY, pcf	**113.74**							



As-Received Moisture Content

_____ %

Maximum Dry Density

_____ pcf

-

_____ %

95% of Max. Density

_____ pcf

90% of Max. Density

_____ pcf

Atterberg Limits		
LL	**NA**	**%**
PL	**NA**	**%**
PI	**NA**	**%**

Classification : _____

UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-001	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.843	Top Dia. (in):	2.007
Length 2 (in):	3.842	Mid. Dia. (in):	2.003
Length 3 (in):	3.841	Bot. Dia. (in):	1.997
Avg. Length (in):	3.842	Area (in^2):	3.149

WATER CONTENT (AFTER TEST)

Tare No.:	3350
Weight of Tare & Wet Sample (g):	390.35
Weight of Tare & Dry Sample (g):	312.03
Weight of Tare (g):	8.10
% Moisture:	25.77

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	383.6	Sample Volume (cm^3):	198.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	383.61	Unit Wet Weight (pcf):	120.74
Avg. Diameter (in):	2.00	Moisture Content (%):	25.77
Avg. Length (in):	3.84	Unit Dry Weight (pcf):	96.00
Avg. Length (cm):	9.76		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
170	**53.99**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-002	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.926	Top Dia. (in):	1.998
Length 2 (in):	3.945	Mid. Dia. (in):	2.005
Length 3 (in):	3.953	Bot. Dia. (in):	2.010
Avg. Length (in):	3.941	Area (in^2):	3.155

WATER CONTENT (AFTER TEST)

Tare No.:	2896
Weight of Tare & Wet Sample (g):	401.49
Weight of Tare & Dry Sample (g):	321.80
Weight of Tare (g):	8.11
% Moisture:	25.40

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	395.3	Sample Volume (cm^3):	203.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	395.25	Unit Wet Weight (pcf):	121.03
Avg. Diameter (in):	2.00	Moisture Content (%):	25.40
Avg. Length (in):	3.94	Unit Dry Weight (pcf):	96.51
Avg. Length (cm):	10.01		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
323	**102.37**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

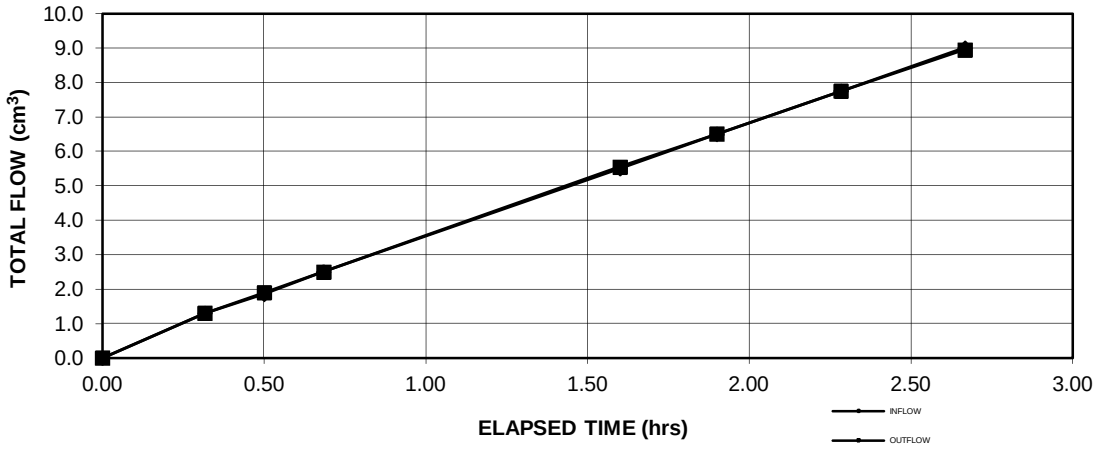
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-003	Avg. Effective Consol. Pressure (psi):	6.25

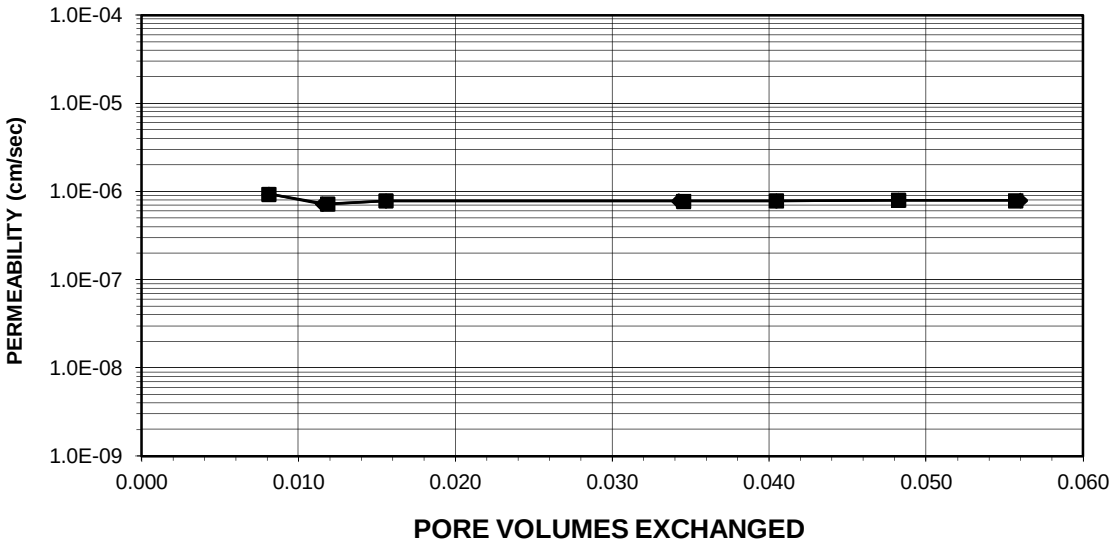
AVERAGE PERMEABILITY = 7.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 7.9E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-003	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	550	910
Weight of Tare & Wet Sample (g)	295.47	807.09
Weight of Tare & Dry Sample (g)	247.78	655.02
Weight of Tare (g)	81.23	109.86
Weight of Water (g)	47.69	152.07
Weight of Dry Sample (g)	166.55	545.16
Moisture Content (%)	**28.6**	**27.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	693.14	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	693.14	689.16
Length 1 (in)	3.029	3.113
Length 2 (in)	3.103	3.039
Length 3 (in)	3.051	3.018
Top Diameter (in)	3.027	3.026
Middle Diameter (in)	3.030	3.027
Bottom Diameter (in)	3.030	3.026
Average Length (in)	3.06	3.06
Average Area (in^2)	7.21	7.19
Sample Volume (cm^3)	361.45	360.31
Unit Wet Weight (g/cm^3)	1.92	1.91
Unit Wet Weight (pcf)	119.7	119.4
Unit Dry Weight (pcf)	93.1	93.4
Unit Dry Weight (g/cm^3)	1.49	1.50
Void Ratio, e	0.81	0.81
Porosity, n	0.45	0.45
Pore Volume (cm^3)	161.9	160.7
Total Weight of Sample After Test (g)		698.54

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-003	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.64

Final Sample Dimensions	
Sample Length (cm), L	7.76
Sample Diameter (cm)	7.69
Sample Area (cm^2), A	46.41
Inflow Burette Area (cm^2), a-in	0.961
Outflow Burette Area (cm^2), a-out	0.850
B Parameter (%)	98

AVERAGE PERMEABILITY = 7.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 7.9E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	10	35	0.000	0.0	0.0	201.3	0	20.7	NA
12/6/22	10	54	0.317	1.3	1.3	198.4	0	20.7	9.3E-07
12/6/22	11	5	0.500	1.9	1.9	197.1	0	20.7	7.2E-07
12/6/22	11	16	0.683	2.5	2.5	195.7	0	20.7	7.9E-07
12/6/22	12	11	1.600	5.5	5.6	189.1	0	20.7	7.8E-07
12/6/22	12	29	1.900	6.5	6.5	186.9	0	20.7	7.8E-07
12/6/22	12	52	2.283	7.8	7.8	184.2	0	20.7	8.0E-07
12/6/22	13	15	2.667	9.0	9.0	181.5	1	20.7	7.9E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-004	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.950	Top Dia. (in):	2.004
Length 2 (in):	3.948	Mid. Dia. (in):	2.002
Length 3 (in):	3.947	Bot. Dia. (in):	2.000
Avg. Length (in):	3.948	Area (in^2):	3.148

WATER CONTENT (AFTER TEST)

Tare No.:	3527
Weight of Tare & Wet Sample (g):	402.73
Weight of Tare & Dry Sample (g):	322.77
Weight of Tare (g):	8.07
% Moisture:	25.41

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	395.5	Sample Volume (cm^3):	203.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	395.54	Unit Wet Weight (pcf):	121.18
Avg. Diameter (in):	2.00	Moisture Content (%):	25.41
Avg. Length (in):	3.95	Unit Dry Weight (pcf):	96.63
Avg. Length (cm):	10.03		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
300	**95.30**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-005	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.926	Top Dia. (in):	2.000
Length 2 (in):	3.913	Mid. Dia. (in):	2.004
Length 3 (in):	3.904	Bot. Dia. (in):	2.008
Avg. Length (in):	3.914	Area (in^2):	3.154

WATER CONTENT (AFTER TEST)

Tare No.:	3513
Weight of Tare & Wet Sample (g):	396.18
Weight of Tare & Dry Sample (g):	318.89
Weight of Tare (g):	8.12
% Moisture:	24.87

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	390.3	Sample Volume (cm^3):	202.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	390.28	Unit Wet Weight (pcf):	120.37
Avg. Diameter (in):	2.00	Moisture Content (%):	24.87
Avg. Length (in):	3.91	Unit Dry Weight (pcf):	96.40
Avg. Length (cm):	9.94		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
526	**166.76**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

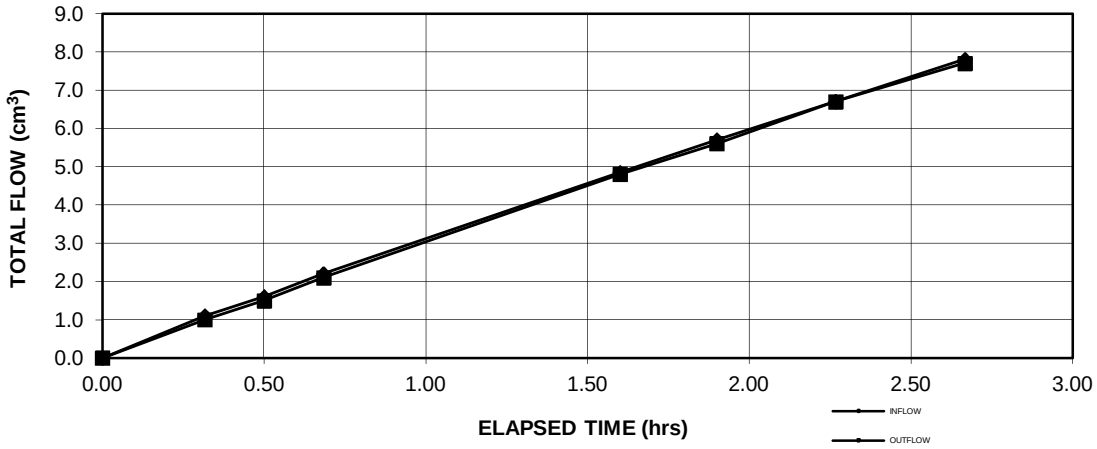
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-006	Avg. Effective Consol. Pressure (psi):	6.25

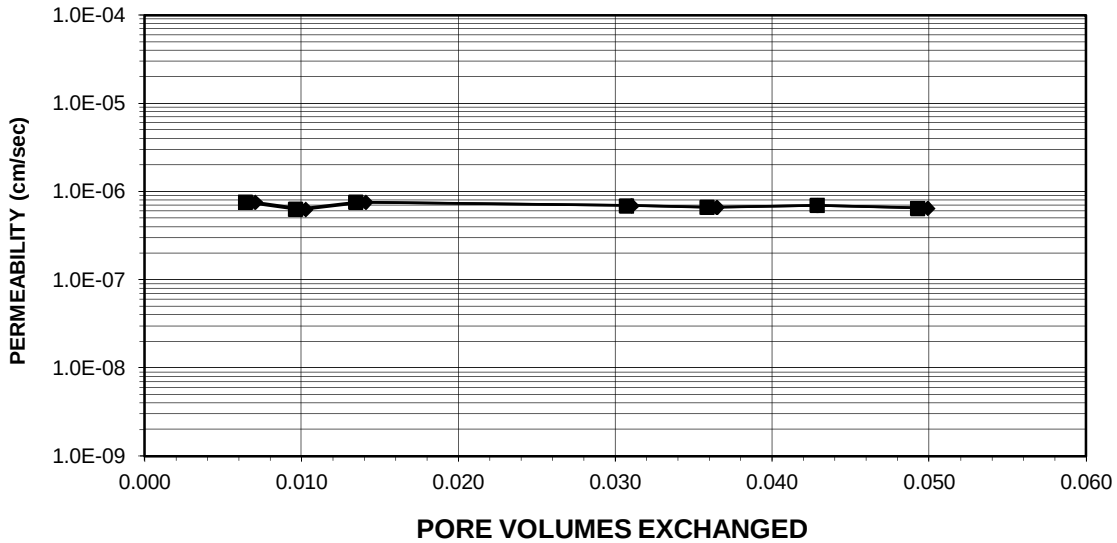
AVERAGE PERMEABILITY = 6.8E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.8E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-006	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	898	598
Weight of Tare & Wet Sample (g)	272.99	776.74
Weight of Tare & Dry Sample (g)	237.62	628.18
Weight of Tare (g)	109.47	84.28
Weight of Water (g)	35.37	148.56
Weight of Dry Sample (g)	128.15	543.90
Moisture Content (%)	**27.6**	**27.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	687.07	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	687.07	685.53
Length 1 (in)	3.061	3.089
Length 2 (in)	3.024	3.062
Length 3 (in)	3.098	3.024
Top Diameter (in)	3.010	3.003
Middle Diameter (in)	3.009	3.006
Bottom Diameter (in)	3.000	3.010
Average Length (in)	3.06	3.06
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	356.06	355.75
Unit Wet Weight (g/cm^3)	1.93	1.93
Unit Wet Weight (pcf)	120.5	120.3
Unit Dry Weight (pcf)	94.4	94.5
Unit Dry Weight (g/cm^3)	1.51	1.51
Void Ratio, e	0.79	0.78
Porosity, n	0.44	0.44
Pore Volume (cm^3)	156.6	156.3
Total Weight of Sample After Test (g)		694.49

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-006	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.63

Final Sample Dimensions	
Sample Length (cm), L	7.77
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.80
Inflow Burette Area (cm^2), a-in	0.852
Outflow Burette Area (cm^2), a-out	0.862
B Parameter (%)	100

AVERAGE PERMEABILITY = 6.8E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.8E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	10	35	0.000	0.0	0.0	203.7	0	20.7	NA
12/6/22	10	54	0.317	1.1	1.0	201.3	0	20.7	7.6E-07
12/6/22	11	5	0.500	1.6	1.5	200.1	0	20.7	6.3E-07
12/6/22	11	16	0.683	2.2	2.1	198.7	0	20.7	7.6E-07
12/6/22	12	11	1.600	4.9	4.8	192.5	0	20.7	6.9E-07
12/6/22	12	29	1.900	5.7	5.6	190.5	0	20.7	6.6E-07
12/6/22	12	51	2.267	6.7	6.7	188.1	0	20.7	7.0E-07
12/6/22	13	15	2.667	7.8	7.7	185.7	1	20.8	6.5E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-3
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-007	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.970	Top Dia. (in):	2.009
Length 2 (in):	3.969	Mid. Dia. (in):	2.005
Length 3 (in):	3.968	Bot. Dia. (in):	2.001
Avg. Length (in):	3.969	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3348
Weight of Tare & Wet Sample (g):	405.72
Weight of Tare & Dry Sample (g):	327.24
Weight of Tare (g):	8.03
% Moisture:	24.59

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	398.6	Sample Volume (cm^3):	205.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	398.6	Unit Wet Weight (pcf):	121.12
Avg. Diameter (in):	2.01	Moisture Content (%):	24.59
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	97.22
Avg. Length (cm):	10.08		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
540	**171.03**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-3
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-008	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.890	Top Dia. (in):	2.000
Length 2 (in):	3.882	Mid. Dia. (in):	2.007
Length 3 (in):	3.882	Bot. Dia. (in):	2.010
Avg. Length (in):	3.885	Area (in^2):	3.159

WATER CONTENT (AFTER TEST)

Tare No.:	3012
Weight of Tare & Wet Sample (g):	397.55
Weight of Tare & Dry Sample (g):	323.09
Weight of Tare (g):	8.16
% Moisture:	23.64

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	391.2	Sample Volume (cm^3):	201.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	391.18	Unit Wet Weight (pcf):	121.37
Avg. Diameter (in):	2.01	Moisture Content (%):	23.64
Avg. Length (in):	3.88	Unit Dry Weight (pcf):	98.16
Avg. Length (cm):	9.87		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1031	**326.33**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

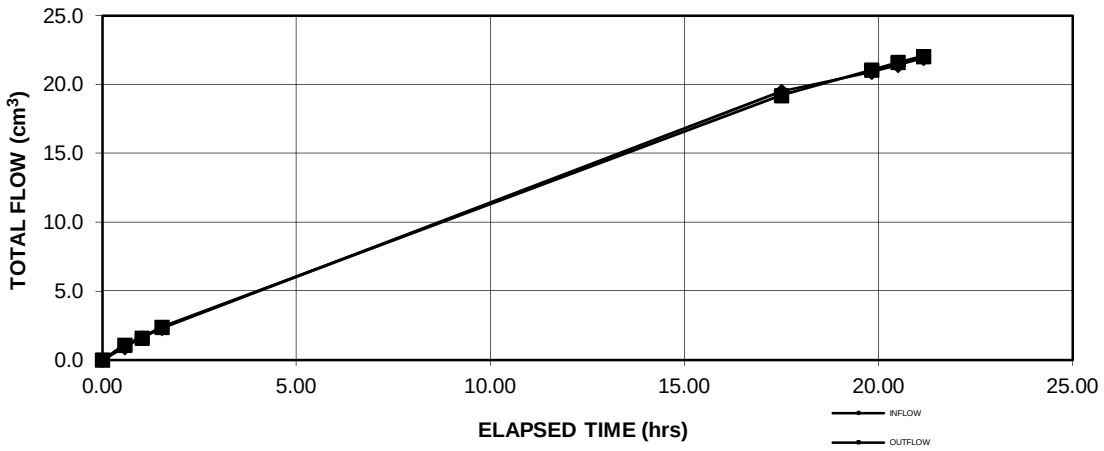
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-3
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-009	Avg. Effective Consol. Pressure (psi):	6.25

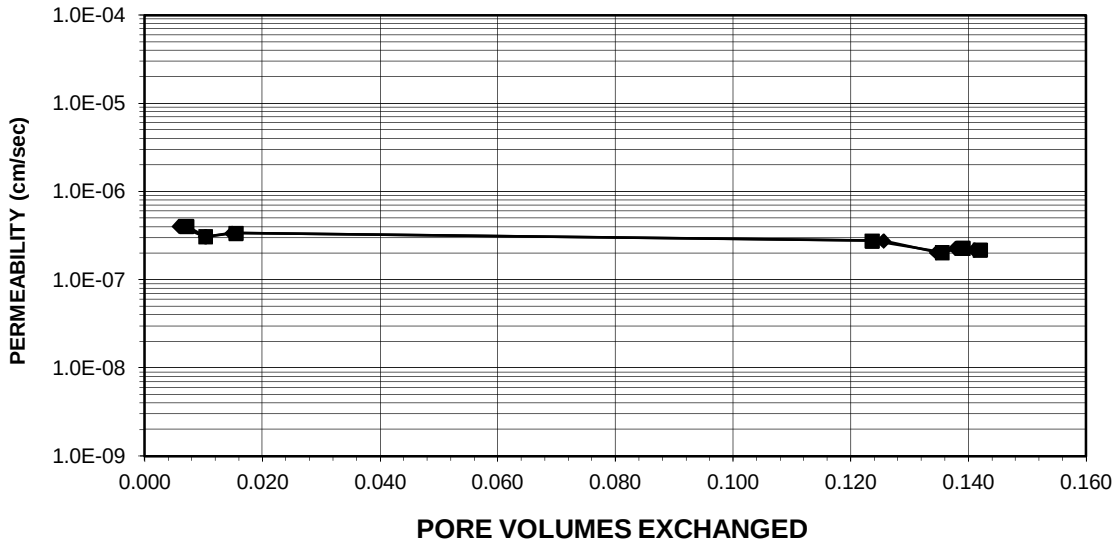
AVERAGE PERMEABILITY = 2.3E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.3E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	12/5/22	Checked By:	JLK	Date:	12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-3
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-009	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	882	565
Weight of Tare & Wet Sample (g)	214.10	774.21
Weight of Tare & Dry Sample (g)	191.92	627.86
Weight of Tare (g)	109.96	82.00
Weight of Water (g)	22.18	146.35
Weight of Dry Sample (g)	81.96	545.86
Moisture Content (%)	**27.1**	**26.8**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	687.32	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	687.32	685.96
Length 1 (in)	3.021	3.010
Length 2 (in)	3.087	3.087
Length 3 (in)	3.078	3.074
Top Diameter (in)	3.005	3.009
Middle Diameter (in)	3.004	3.006
Bottom Diameter (in)	3.005	3.005
Average Length (in)	3.06	3.06
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	355.79	355.68
Unit Wet Weight (g/cm^3)	1.93	1.93
Unit Wet Weight (pcf)	120.6	120.4
Unit Dry Weight (pcf)	94.9	94.9
Unit Dry Weight (g/cm^3)	1.52	1.52
Void Ratio, e	0.78	0.78
Porosity, n	0.44	0.44
Pore Volume (cm^3)	155.4	155.3
Total Weight of Sample After Test (g)		696.39

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-3
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-009	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	87.5
Bottom Cap (psi)	90.0
Cell (psi)	95.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.64

Final Sample Dimensions	
Sample Length (cm), L	7.76
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.879
Outflow Burette Area (cm^2), a-out	0.896
B Parameter (%)	95

AVERAGE PERMEABILITY = 2.3E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.3E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	13	42	0.000	0.0	0.0	203.3	0	20.8	NA
12/6/22	14	16	0.567	0.9	1.1	201.0	0	20.8	4.0E-07
12/6/22	14	43	1.017	1.6	1.6	199.6	0	20.8	3.1E-07
12/6/22	15	14	1.533	2.3	2.4	198.0	0	20.9	3.4E-07
12/7/22	7	12	17.500	19.5	19.2	159.6	0	20.9	2.8E-07
12/7/22	9	31	19.817	20.9	21.1	155.9	0	21.0	2.0E-07
12/7/22	10	12	20.500	21.4	21.6	154.7	0	21.1	2.3E-07
12/7/22	10	51	21.150	21.9	22.1	153.6	1	21.1	2.2E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-4
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-010	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.910	Top Dia. (in):	2.003
Length 2 (in):	3.908	Mid. Dia. (in):	1.998
Length 3 (in):	3.907	Bot. Dia. (in):	1.994
Avg. Length (in):	3.908	Area (in^2):	3.136

WATER CONTENT (AFTER TEST)

Tare No.:	3268
Weight of Tare & Wet Sample (g):	399.01
Weight of Tare & Dry Sample (g):	321.10
Weight of Tare (g):	8.08
% Moisture:	24.89

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	391.8	Sample Volume (cm^3):	200.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.95
Weight of Wet Sample (g):	391.84	Unit Wet Weight (pcf):	121.72
Avg. Diameter (in):	2.00	Moisture Content (%):	24.89
Avg. Length (in):	3.91	Unit Dry Weight (pcf):	97.46
Avg. Length (cm):	9.93		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
360	**114.78**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-4
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-011	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.900	Top Dia. (in):	2.002
Length 2 (in):	3.897	Mid. Dia. (in):	2.010
Length 3 (in):	3.903	Bot. Dia. (in):	2.021
Avg. Length (in):	3.900	Area (in^2):	3.176

WATER CONTENT (AFTER TEST)

Tare No.:	2848
Weight of Tare & Wet Sample (g):	398.32
Weight of Tare & Dry Sample (g):	322.06
Weight of Tare (g):	8.13
% Moisture:	24.29

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	392.0	Sample Volume (cm^3):	203.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	391.99	Unit Wet Weight (pcf):	120.50
Avg. Diameter (in):	2.01	Moisture Content (%):	24.29
Avg. Length (in):	3.90	Unit Dry Weight (pcf):	96.95
Avg. Length (cm):	9.91		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
433	**136.32**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

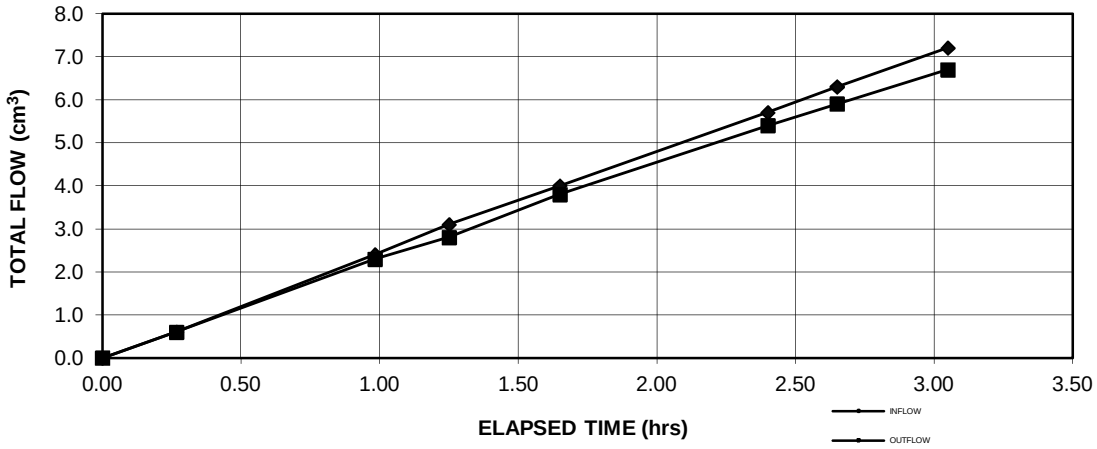
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-4
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-012	Avg. Effective Consol. Pressure (psi):	6.25

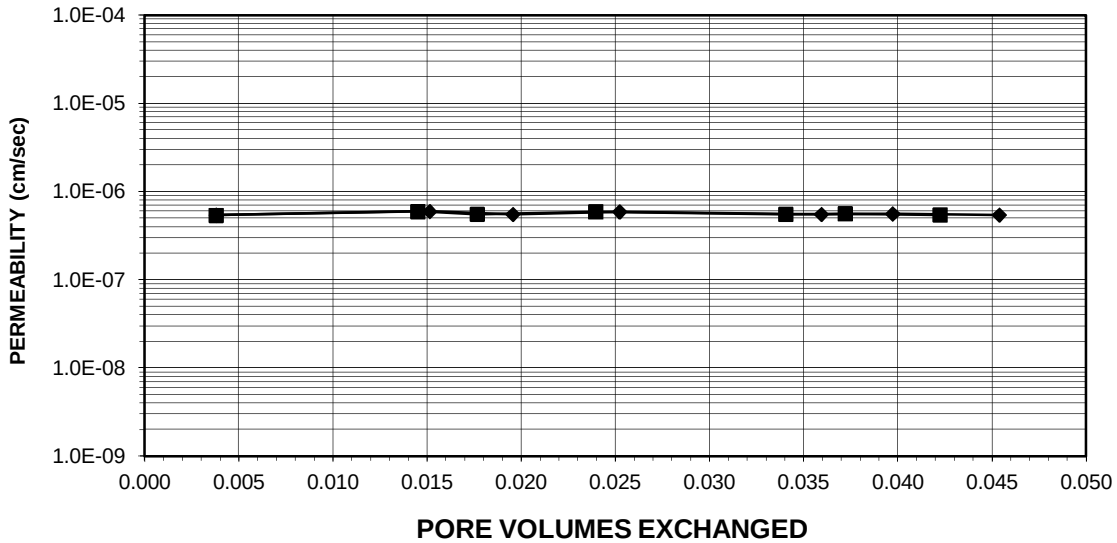
AVERAGE PERMEABILITY = 5.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.6E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-4
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-012	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	606	893
Weight of Tare & Wet Sample (g)	234.16	811.15
Weight of Tare & Dry Sample (g)	202.96	663.42
Weight of Tare (g)	84.90	110.30
Weight of Water (g)	31.20	147.73
Weight of Dry Sample (g)	118.06	553.12
Moisture Content (%)	**26.4**	**26.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	699.38	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	699.38	700.94
Length 1 (in)	3.071	3.106
Length 2 (in)	3.170	3.190
Length 3 (in)	3.150	3.077
Top Diameter (in)	3.004	3.011
Middle Diameter (in)	3.006	3.006
Bottom Diameter (in)	3.005	3.003
Average Length (in)	3.13	3.12
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	363.81	363.51
Unit Wet Weight (g/cm^3)	1.92	1.93
Unit Wet Weight (pcf)	120.0	120.4
Unit Dry Weight (pcf)	94.9	95.0
Unit Dry Weight (g/cm^3)	1.52	1.52
Void Ratio, e	0.78	0.77
Porosity, n	0.44	0.44
Pore Volume (cm^3)	158.9	158.6
Total Weight of Sample After Test (g)		707.77

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-4
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-012	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.15

Final Sample Dimensions	
Sample Length (cm), L	7.94
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 5.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.6E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	11	13	0.000	0.0	0.0	196.8	0	20.7	NA
12/6/22	11	29	0.267	0.6	0.6	195.5	0	20.7	5.4E-07
12/6/22	12	12	0.983	2.4	2.3	191.9	0	20.7	5.9E-07
12/6/22	12	28	1.250	3.1	2.8	190.7	0	20.7	5.5E-07
12/6/22	12	52	1.650	4.0	3.8	188.7	0	20.7	5.9E-07
12/6/22	13	37	2.400	5.7	5.4	185.3	0	20.8	5.5E-07
12/6/22	13	52	2.650	6.3	5.9	184.1	0	20.8	5.6E-07
12/6/22	14	16	3.050	7.2	6.7	182.4	1	20.8	5.4E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-013	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.968	Top Dia. (in):	2.000
Length 2 (in):	3.968	Mid. Dia. (in):	1.998
Length 3 (in):	3.968	Bot. Dia. (in):	1.996
Avg. Length (in):	3.968	Area (in^2):	3.135

WATER CONTENT (AFTER TEST)

Tare No.:	2949
Weight of Tare & Wet Sample (g):	400.52
Weight of Tare & Dry Sample (g):	318.61
Weight of Tare (g):	8.10
% Moisture:	26.38

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	393.3	Sample Volume (cm^3):	203.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	393.3	Unit Wet Weight (pcf):	120.38
Avg. Diameter (in):	2.00	Moisture Content (%):	26.38
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	95.25
Avg. Length (cm):	10.08		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
860	**274.29**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-014	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.904	Top Dia. (in):	2.014
Length 2 (in):	3.910	Mid. Dia. (in):	2.008
Length 3 (in):	3.903	Bot. Dia. (in):	2.004
Avg. Length (in):	3.906	Area (in^2):	3.169

WATER CONTENT (AFTER TEST)

Tare No.:	2991
Weight of Tare & Wet Sample (g):	392.51
Weight of Tare & Dry Sample (g):	312.79
Weight of Tare (g):	8.11
% Moisture:	26.17

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	386.1	Sample Volume (cm^3):	202.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.90
Weight of Wet Sample (g):	386.11	Unit Wet Weight (pcf):	118.79
Avg. Diameter (in):	2.01	Moisture Content (%):	26.17
Avg. Length (in):	3.91	Unit Dry Weight (pcf):	94.16
Avg. Length (cm):	9.92		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
987	**311.47**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

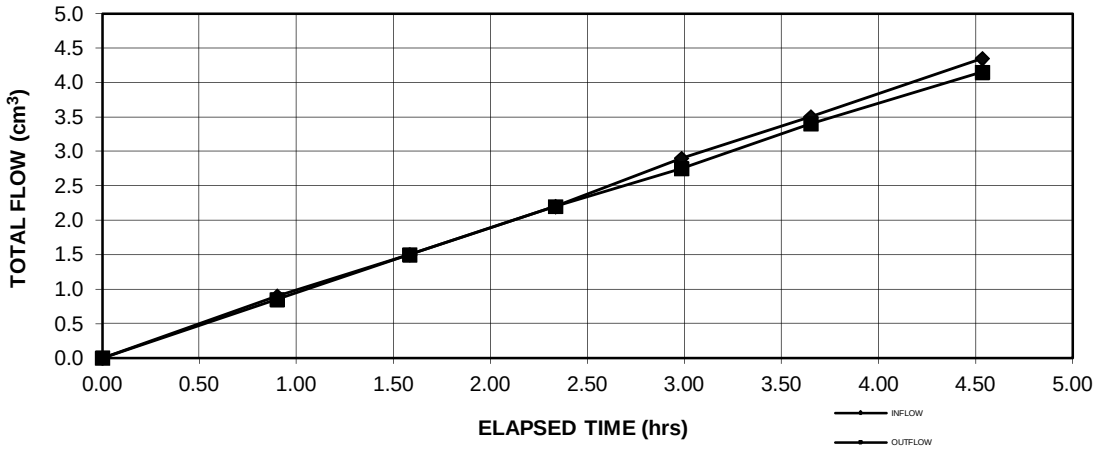
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-015	Avg. Effective Consol. Pressure (psi):	6.25

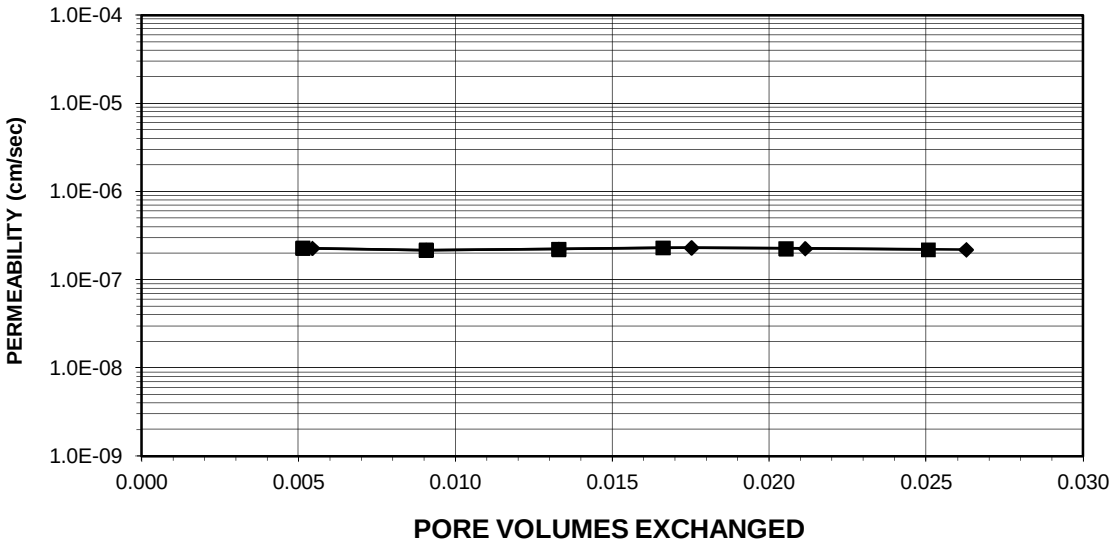
AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-015	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	911	1126
Weight of Tare & Wet Sample (g)	285.83	750.52
Weight of Tare & Dry Sample (g)	244.44	599.63
Weight of Tare (g)	109.68	84.51
Weight of Water (g)	41.39	150.89
Weight of Dry Sample (g)	134.76	515.12
Moisture Content (%)	**30.7**	**29.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	672.81	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	672.81	665.49
Length 1 (in)	3.056	3.027
Length 2 (in)	3.026	3.088
Length 3 (in)	3.098	3.060
Top Diameter (in)	3.010	3.000
Middle Diameter (in)	3.006	3.015
Bottom Diameter (in)	3.003	3.010
Average Length (in)	3.06	3.06
Average Area (in^2)	7.10	7.11
Sample Volume (cm^3)	355.95	356.23
Unit Wet Weight (g/cm^3)	1.89	1.87
Unit Wet Weight (pcf)	118.0	116.6
Unit Dry Weight (pcf)	90.3	90.2
Unit Dry Weight (g/cm^3)	1.45	1.44
Void Ratio, e	0.87	0.87
Porosity, n	0.46	0.46
Pore Volume (cm^3)	165.3	165.6
Total Weight of Sample After Test (g)		682.61

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-015	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.63

Final Sample Dimensions	
Sample Length (cm), L	7.77
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.86
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	11	18	0.000	0.0	0.0	196.8	0	20.7	NA
12/6/22	12	12	0.900	0.9	0.9	194.9	0	20.7	2.3E-07
12/6/22	12	53	1.583	1.5	1.5	193.7	0	20.7	2.2E-07
12/6/22	13	38	2.333	2.2	2.2	192.2	0	20.8	2.2E-07
12/6/22	14	17	2.983	2.9	2.8	190.9	0	20.8	2.3E-07
12/6/22	14	57	3.650	3.5	3.4	189.6	0	20.9	2.3E-07
12/6/22	15	50	4.533	4.4	4.2	188.0	1	21.0	2.2E-07
#REF!	####	###	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-6
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-016	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.904	Top Dia. (in):	2.009
Length 2 (in):	3.903	Mid. Dia. (in):	2.004
Length 3 (in):	3.903	Bot. Dia. (in):	2.000
Avg. Length (in):	3.903	Area (in^2):	3.155

WATER CONTENT (AFTER TEST)

Tare No.:	2805
Weight of Tare & Wet Sample (g):	394.00
Weight of Tare & Dry Sample (g):	308.44
Weight of Tare (g):	8.08
% Moisture:	28.49

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	386.8	Sample Volume (cm^3):	201.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.92
Weight of Wet Sample (g):	386.83	Unit Wet Weight (pcf):	119.60
Avg. Diameter (in):	2.00	Moisture Content (%):	28.49
Avg. Length (in):	3.90	Unit Dry Weight (pcf):	93.09
Avg. Length (cm):	9.91		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
775	**245.62**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-6
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-017	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.852	Top Dia. (in):	2.005
Length 2 (in):	3.847	Mid. Dia. (in):	2.007
Length 3 (in):	3.845	Bot. Dia. (in):	2.012
Avg. Length (in):	3.848	Area (in^2):	3.167

WATER CONTENT (AFTER TEST)

Tare No.:	3271
Weight of Tare & Wet Sample (g):	386.81
Weight of Tare & Dry Sample (g):	304.62
Weight of Tare (g):	8.14
% Moisture:	27.72

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	380.6	Sample Volume (cm^3):	199.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.91
Weight of Wet Sample (g):	380.55	Unit Wet Weight (pcf):	118.92
Avg. Diameter (in):	2.01	Moisture Content (%):	27.72
Avg. Length (in):	3.85	Unit Dry Weight (pcf):	93.11
Avg. Length (cm):	9.77		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
855	**269.99**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

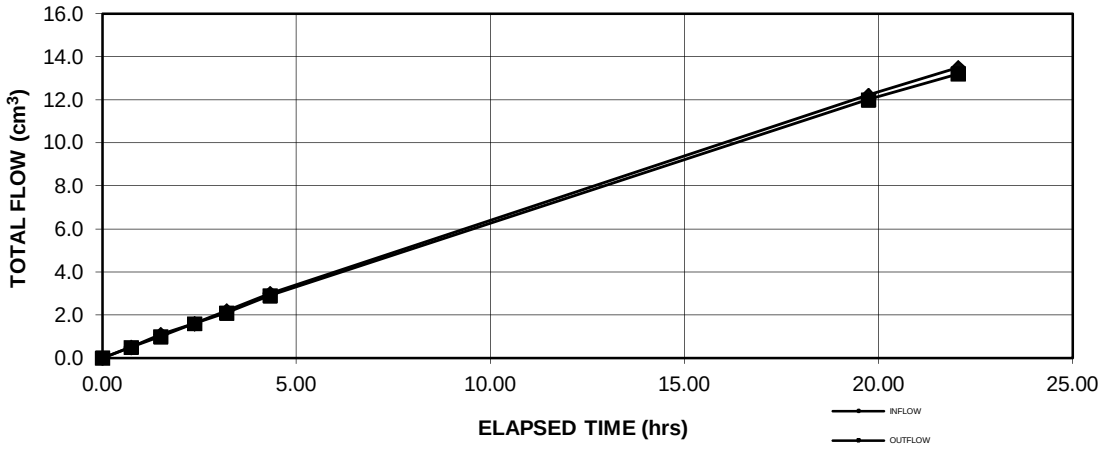
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-6
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-018	Avg. Effective Consol. Pressure (psi):	6.25

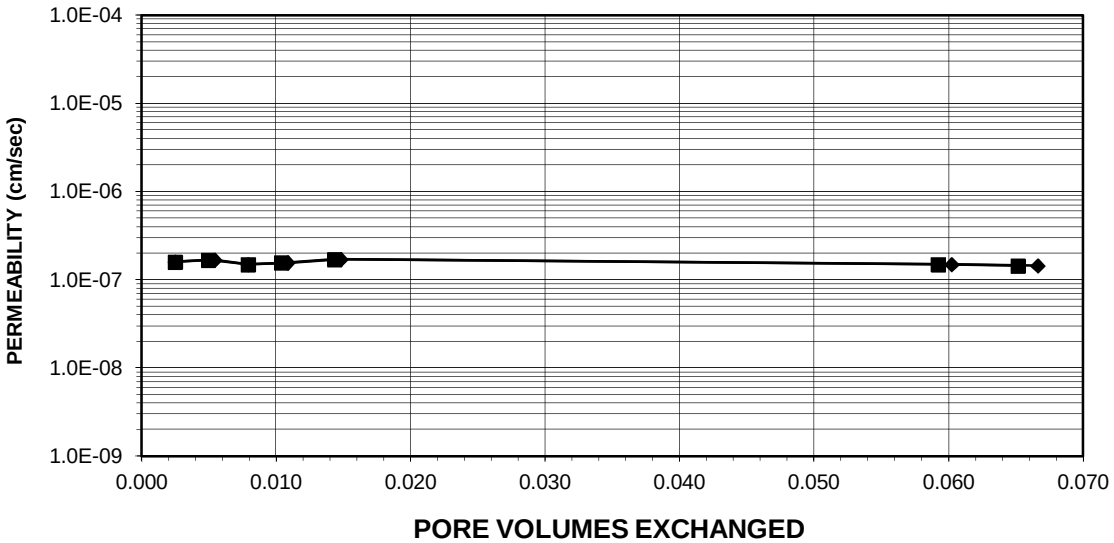
AVERAGE PERMEABILITY = 1.5E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.5E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	12/5/22	Checked By:	JLK	Date:	12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-6
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-018	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1720	1698
Weight of Tare & Wet Sample (g)	107.28	751.01
Weight of Tare & Dry Sample (g)	98.36	578.80
Weight of Tare (g)	81.46	81.08
Weight of Water (g)	8.92	172.21
Weight of Dry Sample (g)	16.90	497.72
Moisture Content (%)	**52.8**	**34.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	674.09	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	674.09	593.87
Length 1 (in)	3.131	3.110
Length 2 (in)	3.105	3.052
Length 3 (in)	3.071	3.094
Top Diameter (in)	3.032	3.039
Middle Diameter (in)	3.030	3.037
Bottom Diameter (in)	3.028	3.032
Average Length (in)	3.10	3.09
Average Area (in^2)	7.21	7.24
Sample Volume (cm^3)	366.58	366.01
Unit Wet Weight (g/cm^3)	1.84	1.62
Unit Wet Weight (pcf)	114.8	101.3
Unit Dry Weight (pcf)	75.1	75.2
Unit Dry Weight (g/cm^3)	1.20	1.21
Void Ratio, e	1.24	1.24
Porosity, n	0.55	0.55
Pore Volume (cm^3)	203.2	202.6
Total Weight of Sample After Test (g)		680.21

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-6
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-018	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.43

Final Sample Dimensions	
Sample Length (cm), L	7.84
Sample Diameter (cm)	7.71
Sample Area (cm^2), A	46.70
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 1.5E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.5E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	11	30	0.000	0.0	0.0	196.8	0	20.7	NA
12/6/22	12	14	0.733	0.5	0.5	195.7	0	20.7	1.6E-07
12/6/22	13	0	1.500	1.1	1.0	194.6	0	20.8	1.7E-07
12/6/22	13	52	2.367	1.6	1.6	193.4	0	20.8	1.5E-07
12/6/22	14	42	3.200	2.2	2.1	192.3	0	20.8	1.6E-07
12/6/22	15	49	4.317	3.0	2.9	190.7	0	21.0	1.7E-07
12/7/22	7	14	19.733	12.2	12.0	171.7	0	20.9	1.5E-07
12/7/22	9	33	22.050	13.5	13.2	169.2	1	21.0	1.4E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-019	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.853	Top Dia. (in):	2.010
Length 2 (in):	3.852	Mid. Dia. (in):	2.006
Length 3 (in):	3.851	Bot. Dia. (in):	2.002
Avg. Length (in):	3.852	Area (in^2):	3.160

WATER CONTENT (AFTER TEST)

Tare No.:	3516
Weight of Tare & Wet Sample (g):	380.08
Weight of Tare & Dry Sample (g):	289.76
Weight of Tare (g):	8.11
% Moisture:	32.07

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	372.9	Sample Volume (cm^3):	199.5
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	372.92	Unit Wet Weight (pcf):	116.64
Avg. Diameter (in):	2.01	Moisture Content (%):	32.07
Avg. Length (in):	3.85	Unit Dry Weight (pcf):	88.32
Avg. Length (cm):	9.78		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1050	**332.23**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-020	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.857	Top Dia. (in):	2.003
Length 2 (in):	3.855	Mid. Dia. (in):	2.011
Length 3 (in):	3.852	Bot. Dia. (in):	2.023
Avg. Length (in):	3.855	Area (in^2):	3.180

WATER CONTENT (AFTER TEST)

Tare No.:	3251
Weight of Tare & Wet Sample (g):	383.02
Weight of Tare & Dry Sample (g):	296.22
Weight of Tare (g):	8.14
% Moisture:	30.13

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	376.4	Sample Volume (cm^3):	200.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	376.39	Unit Wet Weight (pcf):	116.91
Avg. Diameter (in):	2.01	Moisture Content (%):	30.13
Avg. Length (in):	3.85	Unit Dry Weight (pcf):	89.84
Avg. Length (cm):	9.79		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
968	**304.36**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

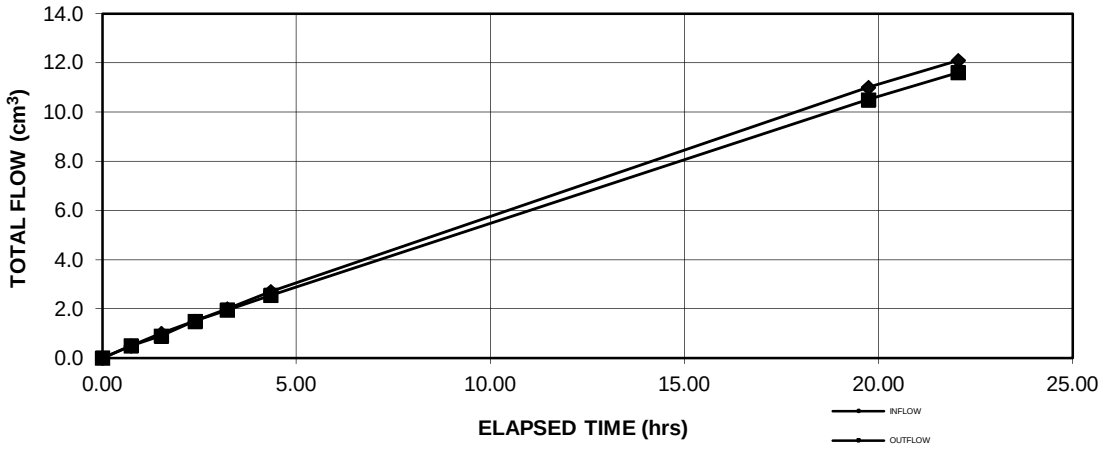
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-021	Avg. Effective Consol. Pressure (psi):	6.25

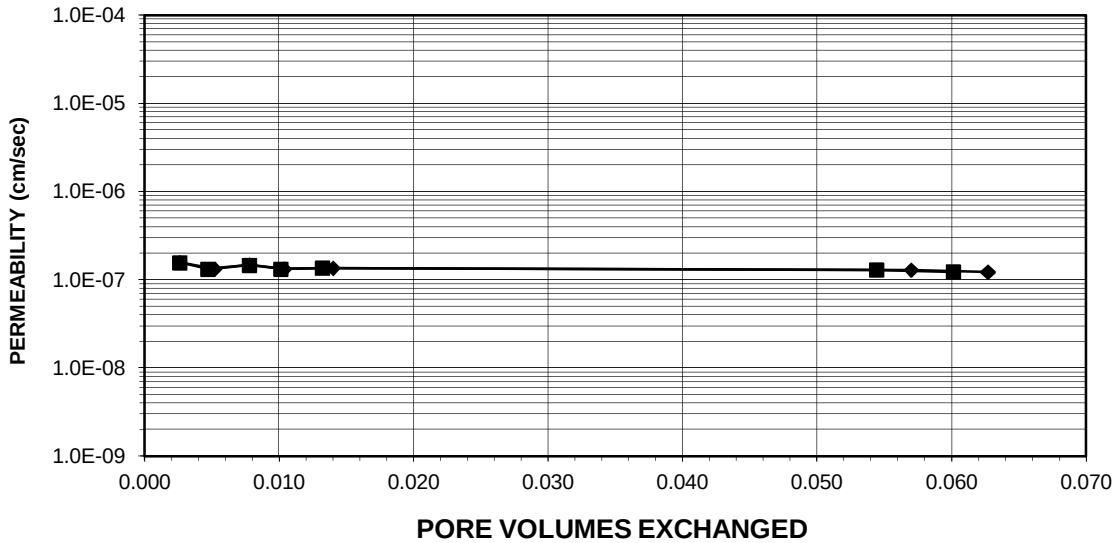
AVERAGE PERMEABILITY = 1.3E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.3E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	12/5/22	Checked By:	JLK	Date:	12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-021	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1596	1128
Weight of Tare & Wet Sample (g)	242.56	735.80
Weight of Tare & Dry Sample (g)	194.51	570.88
Weight of Tare (g)	96.28	84.57
Weight of Water (g)	48.05	164.92
Weight of Dry Sample (g)	98.23	486.31
Moisture Content (%)	**48.9**	**33.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	661.12	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	661.12	594.51
Length 1 (in)	3.037	3.032
Length 2 (in)	3.008	3.010
Length 3 (in)	3.064	3.041
Top Diameter (in)	3.028	3.028
Middle Diameter (in)	3.028	3.030
Bottom Diameter (in)	3.026	3.028
Average Length (in)	3.04	3.03
Average Area (in^2)	7.20	7.20
Sample Volume (cm^3)	358.15	357.44
Unit Wet Weight (g/cm^3)	1.85	1.66
Unit Wet Weight (pcf)	115.2	103.8
Unit Dry Weight (pcf)	77.4	77.5
Unit Dry Weight (g/cm^3)	1.24	1.24
Void Ratio, e	1.18	1.17
Porosity, n	0.54	0.54
Pore Volume (cm^3)	193.7	193.0
Total Weight of Sample After Test (g)		665.86

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-021	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.85

Final Sample Dimensions	
Sample Length (cm), L	7.69
Sample Diameter (cm)	7.69
Sample Area (cm^2), A	46.48
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	100

AVERAGE PERMEABILITY = 1.3E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.3E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	11	30	0.000	0.0	0.0	196.8	0	20.7	NA
12/6/22	12	14	0.733	0.5	0.5	195.7	0	20.7	1.6E-07
12/6/22	13	1	1.517	1.0	0.9	194.8	0	20.8	1.3E-07
12/6/22	13	53	2.383	1.5	1.5	193.7	0	20.8	1.5E-07
12/6/22	14	43	3.217	2.0	2.0	192.7	0	20.8	1.3E-07
12/6/22	15	50	4.333	2.7	2.6	191.3	0	21.0	1.4E-07
12/7/22	7	14	19.733	11.0	10.5	174.5	0	20.9	1.3E-07
12/7/22	9	33	22.050	12.1	11.6	172.3	1	21.0	1.2E-07

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/8/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-8
Project No.:	2022-833-001	Sample No.:	8 Day
Lab ID:	2022-833-001-022	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.769	Top Dia. (in):	2.011
Length 2 (in):	3.768	Mid. Dia. (in):	2.009
Length 3 (in):	3.768	Bot. Dia. (in):	2.003
Avg. Length (in):	3.768	Area (in^2):	3.166

WATER CONTENT (AFTER TEST)

Tare No.:	2903
Weight of Tare & Wet Sample (g):	367.56
Weight of Tare & Dry Sample (g):	275.30
Weight of Tare (g):	8.02
% Moisture:	34.52

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	360.4	Sample Volume (cm^3):	195.5
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.84
Weight of Wet Sample (g):	360.41	Unit Wet Weight (pcf):	115.04
Avg. Diameter (in):	2.01	Moisture Content (%):	34.52
Avg. Length (in):	3.77	Unit Dry Weight (pcf):	85.52
Avg. Length (cm):	9.57		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
270	**85.29**

Tested By JAC Date 12/6/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-8
Project No.:	2022-833-001	Sample No.:	14 Day
Lab ID:	2022-833-001-023	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.824	Top Dia. (in):	2.002
Length 2 (in):	3.822	Mid. Dia. (in):	2.007
Length 3 (in):	3.811	Bot. Dia. (in):	2.009
Avg. Length (in):	3.819	Area (in^2):	3.160

WATER CONTENT (AFTER TEST)

Tare No.:	3534
Weight of Tare & Wet Sample (g):	373.21
Weight of Tare & Dry Sample (g):	282.71
Weight of Tare (g):	8.08
% Moisture:	32.95

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	366.8	Sample Volume (cm^3):	197.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.85
Weight of Wet Sample (g):	366.81	Unit Wet Weight (pcf):	115.72
Avg. Diameter (in):	2.01	Moisture Content (%):	32.95
Avg. Length (in):	3.82	Unit Dry Weight (pcf):	87.04
Avg. Length (cm):	9.70		

ELECTRONIC DEVICE LOAD (lb)	***STRESS (psi)***
306	**96.82**

Tested By NJM Date 12/12/22 Input Checked By JLK Date 12/13/22

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

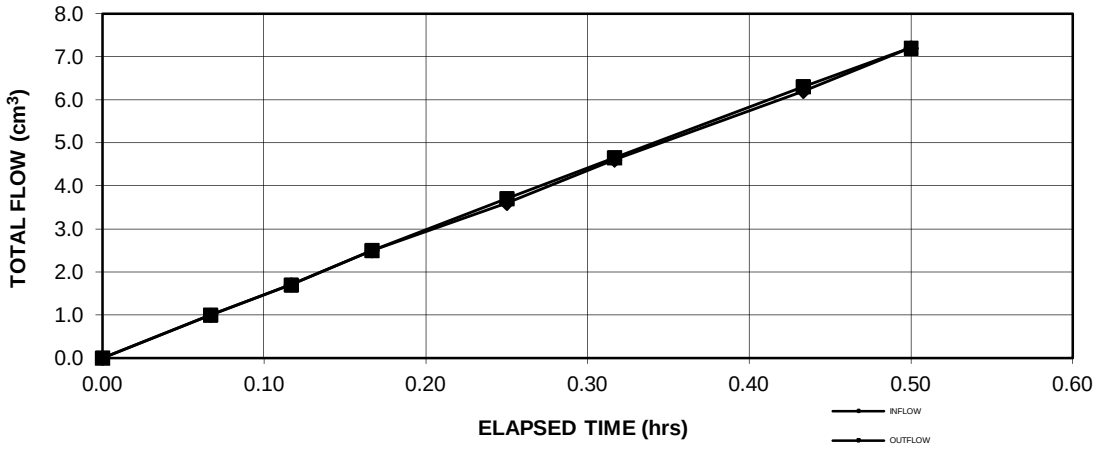
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-8
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-024	Avg. Effective Consol. Pressure (psi):	6.25

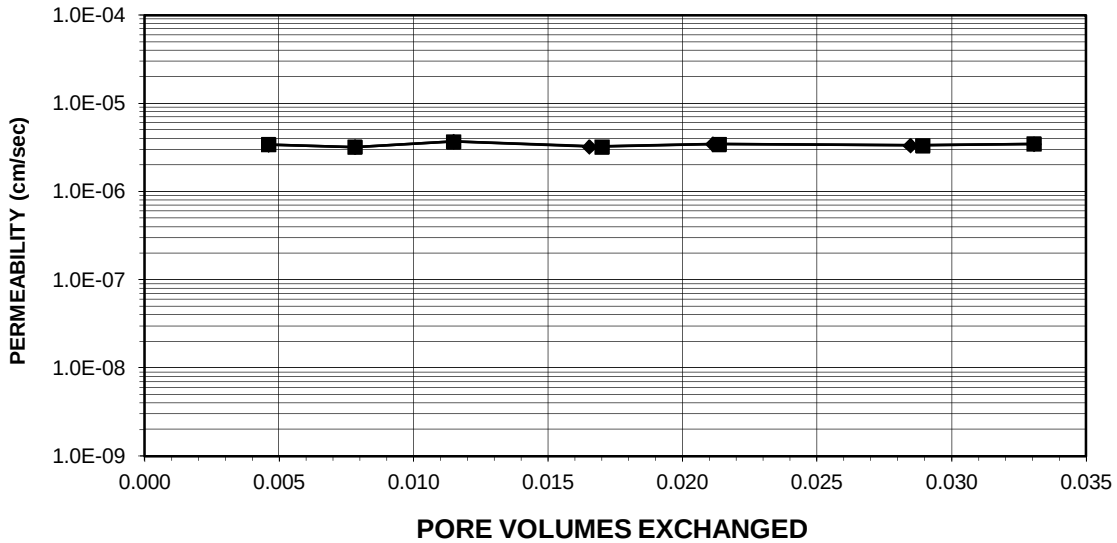
AVERAGE PERMEABILITY = 3.4E-06 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.4E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-8
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-024	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	883	870
Weight of Tare & Wet Sample (g)	158.02	751.31
Weight of Tare & Dry Sample (g)	137.66	573.06
Weight of Tare (g)	109.76	109.37
Weight of Water (g)	20.36	178.25
Weight of Dry Sample (g)	27.90	463.69
Moisture Content (%)	**73.0**	**38.4**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	641.45	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	641.45	513.39
Length 1 (in)	3.045	2.983
Length 2 (in)	2.991	3.053
Length 3 (in)	3.005	2.962
Top Diameter (in)	3.029	3.036
Middle Diameter (in)	3.030	3.032
Bottom Diameter (in)	3.032	3.032
Average Length (in)	3.01	3.00
Average Area (in^2)	7.21	7.23
Sample Volume (cm^3)	356.18	355.19
Unit Wet Weight (g/cm^3)	1.80	1.45
Unit Wet Weight (pcf)	112.4	90.2
Unit Dry Weight (pcf)	65.0	65.2
Unit Dry Weight (g/cm^3)	1.04	1.04
Void Ratio, e	1.59	1.59
Porosity, n	0.61	0.61
Pore Volume (cm^3)	218.8	217.8
Total Weight of Sample After Test (g)		644.10

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	11/28/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-8
Project No.:	2022-833-001	Sample No.:	7 Day
Lab ID No.:	2022-833-001-024	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.07

Final Sample Dimensions	
Sample Length (cm), L	7.62
Sample Diameter (cm)	7.70
Sample Area (cm^2), A	46.62
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	100

AVERAGE PERMEABILITY = 3.4E-06 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.4E-08 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
12/6/22	11	2	0.000	0.0	0.0	196.8	0	20.7	NA
12/6/22	11	6	0.067	1.0	1.0	194.7	0	20.7	3.4E-06
12/6/22	11	9	0.117	1.7	1.7	193.2	0	20.7	3.2E-06
12/6/22	11	12	0.167	2.5	2.5	191.6	0	20.7	3.7E-06
12/6/22	11	17	0.250	3.6	3.7	189.2	0	20.7	3.2E-06
12/6/22	11	21	0.317	4.6	4.7	187.2	0	20.7	3.4E-06
12/6/22	11	28	0.433	6.2	6.3	183.8	0	20.7	3.3E-06
12/6/22	11	32	0.500	7.2	7.2	181.9	1	20.7	3.5E-06

Tested By: JG Date: 12/5/22 Checked By: JLK Date: 12/7/22

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-001	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.965	Top Dia. (in):	2.003
Length 2 (in):	3.963	Mid. Dia. (in):	2.003
Length 3 (in):	3.963	Bot. Dia. (in):	1.997
Avg. Length (in):	3.964	Area (in^2):	3.145

WATER CONTENT (AFTER TEST)

Tare No.:	3047
Weight of Tare & Wet Sample (g):	417.80
Weight of Tare & Dry Sample (g):	336.00
Weight of Tare (g):	8.17
% Moisture:	24.95

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	410.8	Sample Volume (cm^3):	204.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	2.01
Weight of Wet Sample (g):	410.8	Unit Wet Weight (pcf):	125.50
Avg. Diameter (in):	2.00	Moisture Content (%):	24.95
Avg. Length (in):	3.96	Unit Dry Weight (pcf):	100.44
Avg. Length (cm):	10.07		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
170	**54.06**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-002	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.953	Top Dia. (in):	2.003
Length 2 (in):	3.952	Mid. Dia. (in):	2.001
Length 3 (in):	3.950	Bot. Dia. (in):	2.000
Avg. Length (in):	3.952	Area (in^2):	3.146

WATER CONTENT (AFTER TEST)

Tare No.:	3171
Weight of Tare & Wet Sample (g):	413.79
Weight of Tare & Dry Sample (g):	332.81
Weight of Tare (g):	8.08
% Moisture:	24.94

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	408.2	Sample Volume (cm^3):	203.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	2.00
Weight of Wet Sample (g):	408.23	Unit Wet Weight (pcf):	125.05
Avg. Diameter (in):	2.00	Moisture Content (%):	24.94
Avg. Length (in):	3.95	Unit Dry Weight (pcf):	100.09
Avg. Length (cm):	10.04		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
340	**108.08**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-003	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.963	Top Dia. (in):	2.007
Length 2 (in):	3.963	Mid. Dia. (in):	2.005
Length 3 (in):	3.962	Bot. Dia. (in):	2.001
Avg. Length (in):	3.963	Area (in^2):	3.155

WATER CONTENT (AFTER TEST)

Tare No.:	3102
Weight of Tare & Wet Sample (g):	404.91
Weight of Tare & Dry Sample (g):	325.91
Weight of Tare (g):	8.08
% Moisture:	24.86

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	410.3	Sample Volume (cm^3):	204.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	2.00
Weight of Wet Sample (g):	410.29	Unit Wet Weight (pcf):	124.96
Avg. Diameter (in):	2.00	Moisture Content (%):	24.86
Avg. Length (in):	3.96	Unit Dry Weight (pcf):	100.08
Avg. Length (cm):	10.07		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
465	**147.37**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

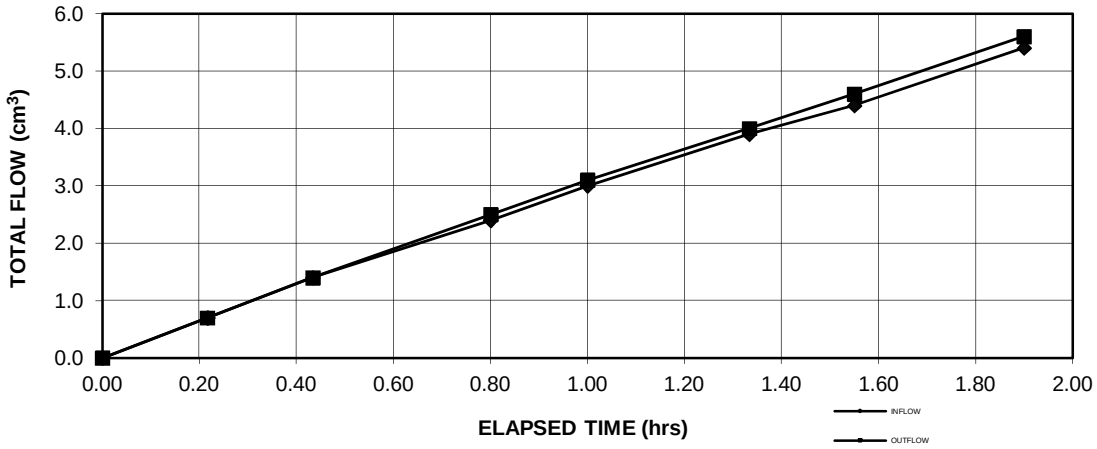
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-004	Avg. Effective Consol. Pressure (psi):	6.25

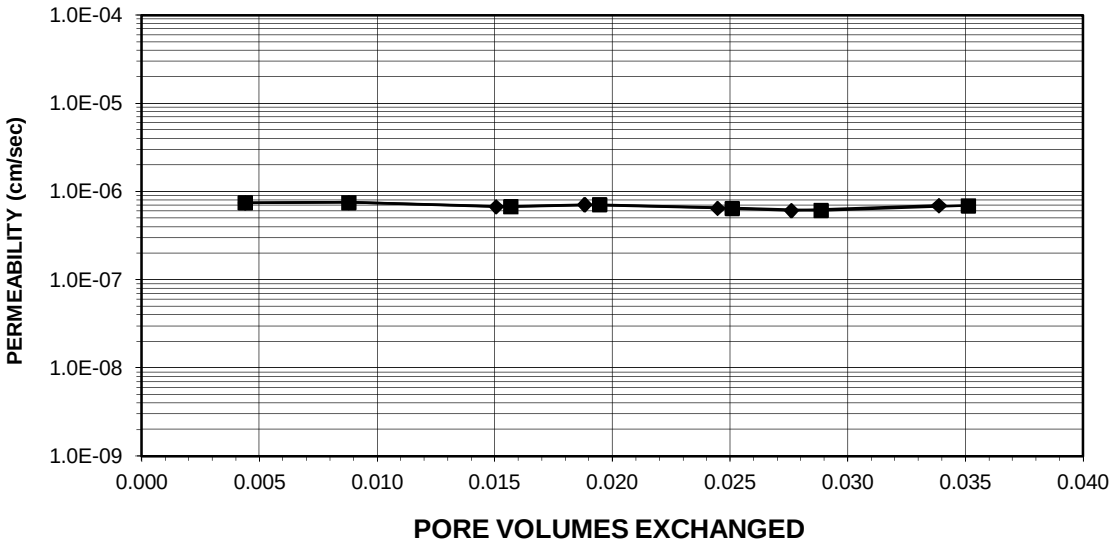
AVERAGE PERMEABILITY = 6.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.6E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-004	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	544	538
Weight of Tare & Wet Sample (g)	186.20	795.75
Weight of Tare & Dry Sample (g)	162.90	648.22
Weight of Tare (g)	84.01	81.29
Weight of Water (g)	23.30	147.53
Weight of Dry Sample (g)	78.89	566.93
Moisture Content (%)	**29.5**	**26.0**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	716.30	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	716.30	696.88
Length 1 (in)	3.075	3.159
Length 2 (in)	3.188	3.160
Length 3 (in)	3.118	3.088
Top Diameter (in)	3.005	3.001
Middle Diameter (in)	3.008	3.005
Bottom Diameter (in)	3.008	3.007
Average Length (in)	3.13	3.14
Average Area (in^2)	7.10	7.09
Sample Volume (cm^3)	363.90	364.26
Unit Wet Weight (g/cm^3)	1.97	1.91
Unit Wet Weight (pcf)	122.9	119.4
Unit Dry Weight (pcf)	94.9	94.8
Unit Dry Weight (g/cm^3)	1.52	1.52
Void Ratio, e	0.78	0.78
Porosity, n	0.44	0.44
Pore Volume (cm^3)	159.1	159.5
Total Weight of Sample After Test (g)		718.34

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-004	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.07

Final Sample Dimensions	
Sample Length (cm), L	7.96
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.74
Inflow Burette Area (cm^2), a-in	0.921
Outflow Burette Area (cm^2), a-out	0.922
B Parameter (%)	96

AVERAGE PERMEABILITY = 6.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.6E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/3/23	8	35	0.000	0.0	0.0	201.7	0	21.3	NA
1/3/23	8	48	0.217	0.7	0.7	200.2	0	21.3	7.5E-07
1/3/23	9	1	0.433	1.4	1.4	198.6	0	21.3	7.5E-07
1/3/23	9	23	0.800	2.4	2.5	196.4	0	21.3	6.7E-07
1/3/23	9	35	1.000	3.0	3.1	195.1	0	21.3	7.1E-07
1/3/23	9	55	1.333	3.9	4.0	193.2	0	21.4	6.4E-07
1/3/23	10	8	1.550	4.4	4.6	192.0	0	21.4	6.1E-07
1/3/23	10	29	1.900	5.4	5.6	189.8	1	21.4	6.9E-07

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

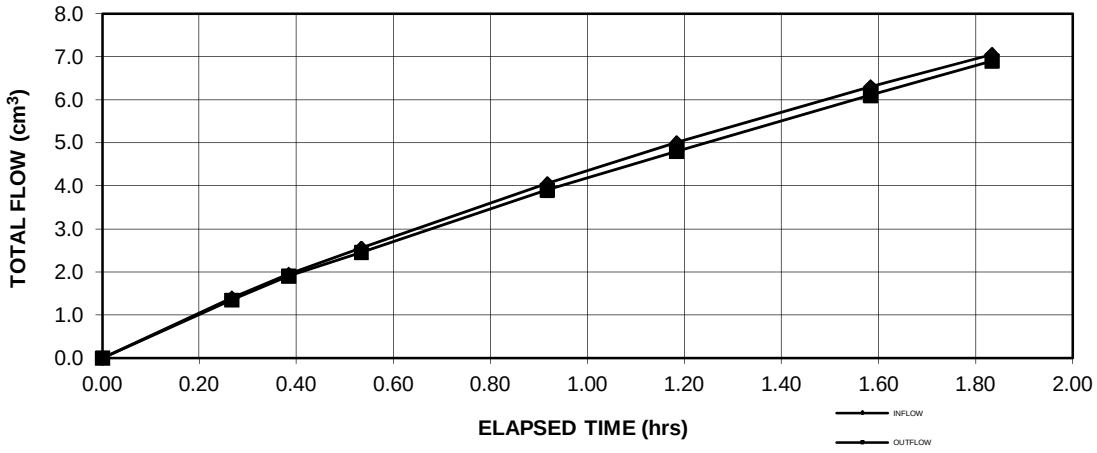
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-005	Avg. Effective Consol. Pressure (psi):	6.25

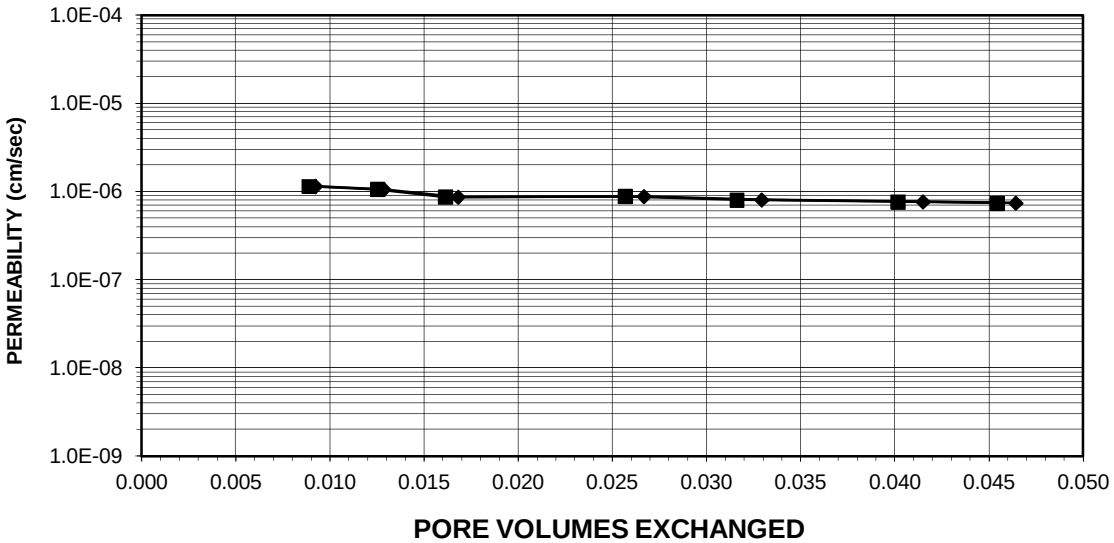
AVERAGE PERMEABILITY = 8.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.0E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-005	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	916	580
Weight of Tare & Wet Sample (g)	163.37	760.47
Weight of Tare & Dry Sample (g)	150.73	620.68
Weight of Tare (g)	109.46	83.93
Weight of Water (g)	12.64	139.79
Weight of Dry Sample (g)	41.27	536.75
Moisture Content (%)	**30.6**	**26.0**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	681.36	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	681.36	657.45
Length 1 (in)	2.943	3.003
Length 2 (in)	3.000	2.950
Length 3 (in)	2.963	2.954
Top Diameter (in)	3.007	3.002
Middle Diameter (in)	3.008	3.006
Bottom Diameter (in)	3.005	3.007
Average Length (in)	2.97	2.97
Average Area (in^2)	7.10	7.09
Sample Volume (cm^3)	345.40	345.06
Unit Wet Weight (g/cm^3)	1.97	1.91
Unit Wet Weight (pcf)	123.1	118.9
Unit Dry Weight (pcf)	94.3	94.4
Unit Dry Weight (g/cm^3)	1.51	1.51
Void Ratio, e	0.79	0.79
Porosity, n	0.44	0.44
Pore Volume (cm^3)	152.2	151.9
Total Weight of Sample After Test (g)		682.56

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-005	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.31

Final Sample Dimensions	
Sample Length (cm), L	7.54
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.76
Inflow Burette Area (cm^2), a-in	0.904
Outflow Burette Area (cm^2), a-out	0.876
B Parameter (%)	98

AVERAGE PERMEABILITY = 8.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.0E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	10	2	0.000	0.0	0.0	202.3	0	21.2	NA
1/16/23	10	18	0.267	1.4	1.4	199.2	0	21.2	1.1E-06
1/16/23	10	25	0.383	2.0	1.9	197.9	0	21.2	1.1E-06
1/16/23	10	34	0.533	2.6	2.5	196.6	0	21.2	8.7E-07
1/16/23	10	57	0.917	4.1	3.9	193.3	0	21.2	8.8E-07
1/16/23	11	13	1.183	5.0	4.8	191.2	0	21.2	8.0E-07
1/16/23	11	37	1.583	6.3	6.1	188.3	0	21.2	7.6E-07
1/16/23	11	52	1.833	7.1	6.9	186.5	1	21.2	7.4E-07

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-006	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.975	Top Dia. (in):	2.005
Length 2 (in):	3.975	Mid. Dia. (in):	2.002
Length 3 (in):	3.974	Bot. Dia. (in):	2.002
Avg. Length (in):	3.975	Area (in^2):	3.151

WATER CONTENT (AFTER TEST)

Tare No.:	2965
Weight of Tare & Wet Sample (g):	408.98
Weight of Tare & Dry Sample (g):	322.54
Weight of Tare (g):	8.13
% Moisture:	27.49

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.3	Sample Volume (cm^3):	205.2
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.96
Weight of Wet Sample (g):	402.26	Unit Wet Weight (pcf):	122.30
Avg. Diameter (in):	2.00	Moisture Content (%):	27.49
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	95.93
Avg. Length (cm):	10.10		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
270	**85.69**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-007	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.971	Top Dia. (in):	2.008
Length 2 (in):	3.970	Mid. Dia. (in):	2.005
Length 3 (in):	3.968	Bot. Dia. (in):	2.002
Avg. Length (in):	3.970	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3301
Weight of Tare & Wet Sample (g):	409.22
Weight of Tare & Dry Sample (g):	324.64
Weight of Tare (g):	8.12
% Moisture:	26.72

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.9	Sample Volume (cm^3):	205.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.96
Weight of Wet Sample (g):	402.9	Unit Wet Weight (pcf):	122.41
Avg. Diameter (in):	2.01	Moisture Content (%):	26.72
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	96.60
Avg. Length (cm):	10.08		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
530	**167.86**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-008	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.981	Top Dia. (in):	2.006
Length 2 (in):	3.980	Mid. Dia. (in):	2.005
Length 3 (in):	3.980	Bot. Dia. (in):	2.000
Avg. Length (in):	3.980	Area (in^2):	3.153

WATER CONTENT (AFTER TEST)

Tare No.:	3114
Weight of Tare & Wet Sample (g):	405.58
Weight of Tare & Dry Sample (g):	322.70
Weight of Tare (g):	8.09
% Moisture:	26.34

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	401.3	Sample Volume (cm^3):	205.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.95
Weight of Wet Sample (g):	401.3	Unit Wet Weight (pcf):	121.76
Avg. Diameter (in):	2.00	Moisture Content (%):	26.34
Avg. Length (in):	3.98	Unit Dry Weight (pcf):	96.37
Avg. Length (cm):	10.11		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
725	**229.93**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

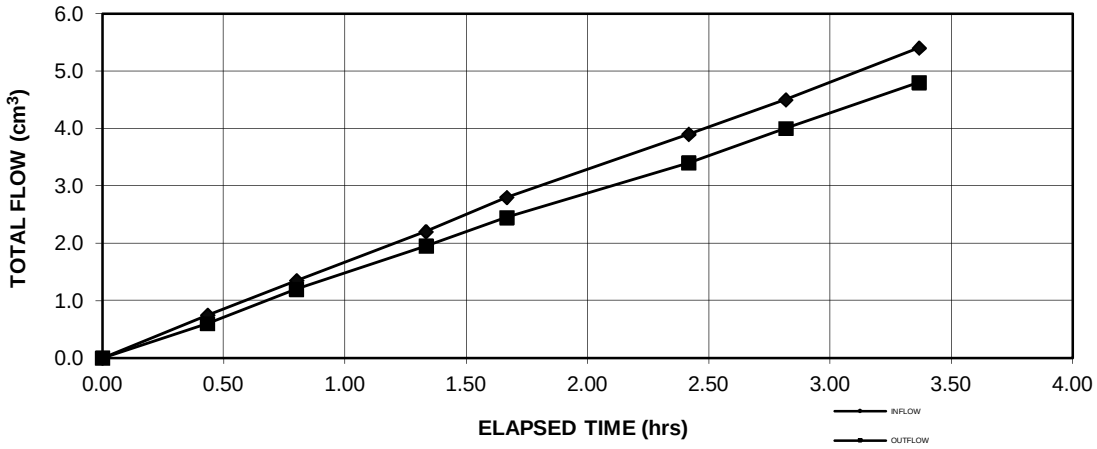
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-009	Avg. Effective Consol. Pressure (psi):	6.25

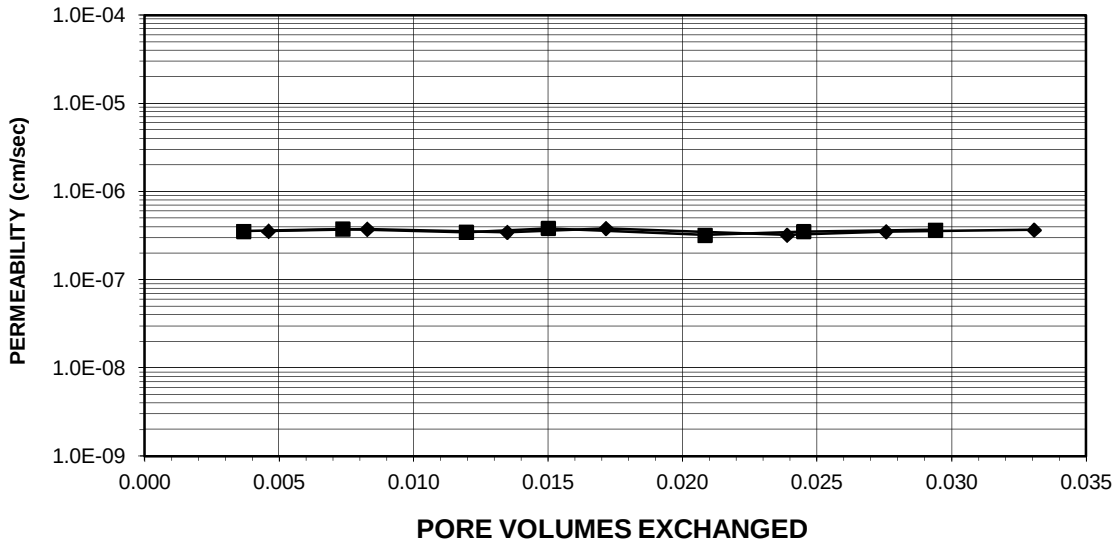
AVERAGE PERMEABILITY = 3.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.6E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-009	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	566	870
Weight of Tare & Wet Sample (g)	147.41	800.21
Weight of Tare & Dry Sample (g)	132.85	647.61
Weight of Tare (g)	84.34	109.32
Weight of Water (g)	14.56	152.60
Weight of Dry Sample (g)	48.51	538.29
Moisture Content (%)	**30.0**	**28.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	695.26	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	695.26	686.35
Length 1 (in)	3.152	3.084
Length 2 (in)	3.055	3.114
Length 3 (in)	3.130	3.118
Top Diameter (in)	3.008	3.008
Middle Diameter (in)	3.005	3.005
Bottom Diameter (in)	3.005	3.008
Average Length (in)	3.11	3.11
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	361.96	361.38
Unit Wet Weight (g/cm^3)	1.92	1.90
Unit Wet Weight (pcf)	119.9	118.6
Unit Dry Weight (pcf)	92.2	92.4
Unit Dry Weight (g/cm^3)	1.48	1.48
Void Ratio, e	0.83	0.82
Porosity, n	0.45	0.45
Pore Volume (cm^3)	163.9	163.3
Total Weight of Sample After Test (g)		697.86

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-009	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.28

Final Sample Dimensions	
Sample Length (cm), L	7.89
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.82
Inflow Burette Area (cm^2), a-in	0.911
Outflow Burette Area (cm^2), a-out	0.968
B Parameter (%)	97

AVERAGE PERMEABILITY = 3.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.6E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/3/23	8	35	0.000	0.0	0.0	202.6	0	21.3	NA
1/3/23	9	1	0.433	0.8	0.6	201.1	0	21.3	3.6E-07
1/3/23	9	23	0.800	1.4	1.2	199.9	0	21.3	3.7E-07
1/3/23	9	55	1.333	2.2	2.0	198.2	0	21.4	3.5E-07
1/3/23	10	15	1.667	2.8	2.5	197.0	0	21.4	3.8E-07
1/3/23	11	0	2.417	3.9	3.4	194.8	0	21.4	3.2E-07
1/3/23	11	24	2.817	4.5	4.0	193.6	0	21.5	3.5E-07
1/3/23	11	57	3.367	5.4	4.8	191.8	1	21.5	3.7E-07

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

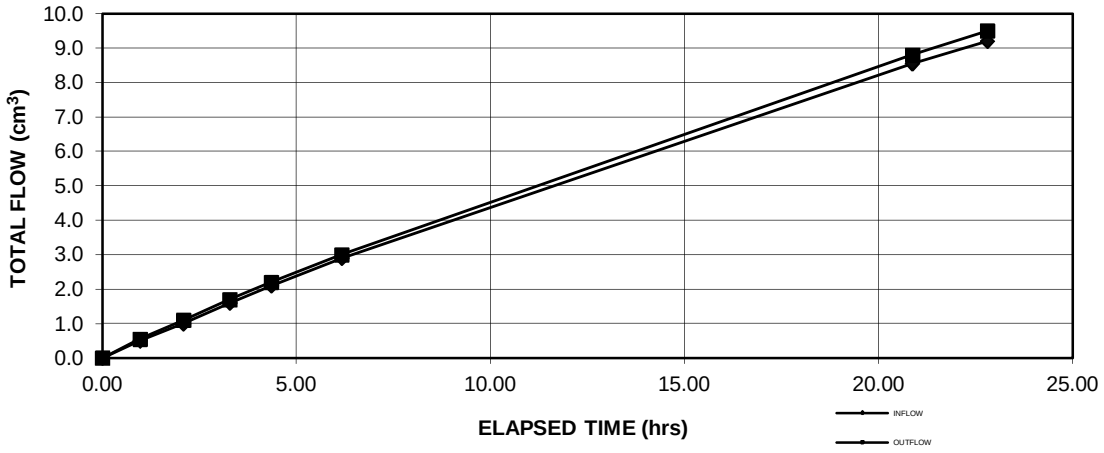
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-010	Avg. Effective Consol. Pressure (psi):	6.25

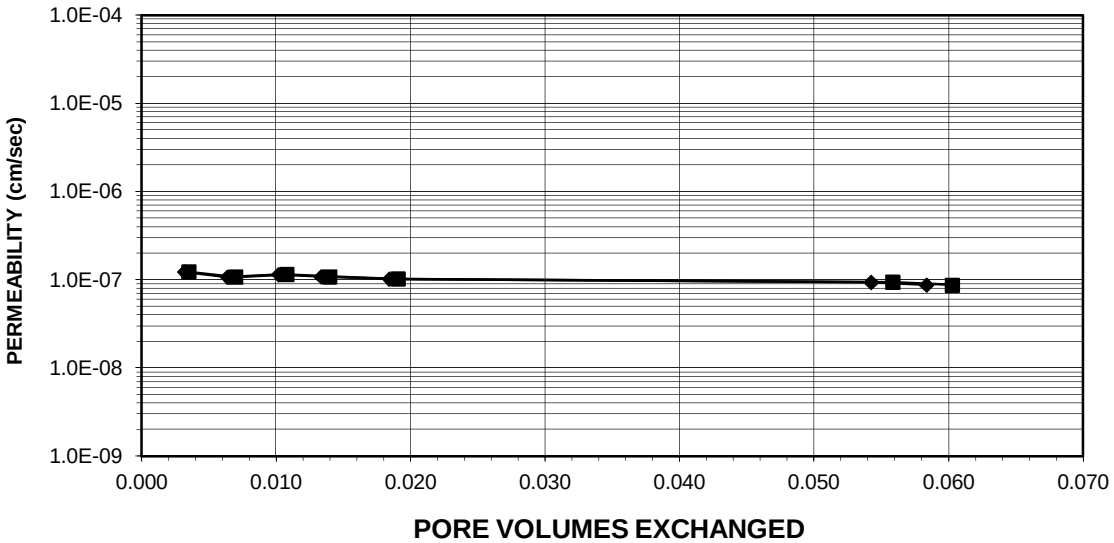
AVERAGE PERMEABILITY = 9.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.8E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-010	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	542	542
Weight of Tare & Wet Sample (g)	263.42	768.85
Weight of Tare & Dry Sample (g)	222.95	618.02
Weight of Tare (g)	81.69	81.71
Weight of Water (g)	40.47	150.83
Weight of Dry Sample (g)	141.26	536.31
Moisture Content (%)	**28.6**	**28.1**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	690.67	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	690.67	687.85
Length 1 (in)	3.033	3.068
Length 2 (in)	3.088	3.030
Length 3 (in)	3.037	3.094
Top Diameter (in)	3.005	3.007
Middle Diameter (in)	3.004	3.006
Bottom Diameter (in)	3.000	3.007
Average Length (in)	3.05	3.06
Average Area (in^2)	7.08	7.10
Sample Volume (cm^3)	354.31	356.49
Unit Wet Weight (g/cm^3)	1.95	1.93
Unit Wet Weight (pcf)	121.7	120.4
Unit Dry Weight (pcf)	94.6	94.0
Unit Dry Weight (g/cm^3)	1.52	1.51
Void Ratio, e	0.78	0.79
Porosity, n	0.44	0.44
Pore Volume (cm^3)	155.5	157.7
Total Weight of Sample After Test (g)		694.50

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-010	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.58

Final Sample Dimensions	
Sample Length (cm), L	7.78
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	1.002
Outflow Burette Area (cm^2), a-out	0.915
B Parameter (%)	95

AVERAGE PERMEABILITY = 9.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.8E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	10	0	0.000	0.0	0.0	206.3	0	21.2	NA
1/16/23	10	58	0.967	0.5	0.6	205.1	0	21.2	1.2E-07
1/16/23	12	5	2.083	1.0	1.1	204.0	0	21.2	1.1E-07
1/16/23	13	17	3.283	1.6	1.7	202.8	0	21.2	1.1E-07
1/16/23	14	21	4.350	2.1	2.2	201.7	0	21.1	1.1E-07
1/16/23	16	10	6.167	2.9	3.0	200.0	0	21.1	1.0E-07
1/17/23	6	52	20.867	8.6	8.8	187.9	0	21.2	9.3E-08
1/17/23	8	48	22.800	9.2	9.5	186.4	1	21.2	8.7E-08

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-011	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.887	Top Dia. (in):	2.007
Length 2 (in):	3.886	Mid. Dia. (in):	2.005
Length 3 (in):	3.885	Bot. Dia. (in):	1.998
Avg. Length (in):	3.886	Area (in^2):	3.152

WATER CONTENT (AFTER TEST)

Tare No.:	3159
Weight of Tare & Wet Sample (g):	400.01
Weight of Tare & Dry Sample (g):	318.18
Weight of Tare (g):	8.12
% Moisture:	26.39

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	393.1	Sample Volume (cm^3):	200.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.96
Weight of Wet Sample (g):	393.08	Unit Wet Weight (pcf):	122.20
Avg. Diameter (in):	2.00	Moisture Content (%):	26.39
Avg. Length (in):	3.89	Unit Dry Weight (pcf):	96.68
Avg. Length (cm):	9.87		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
905	**287.11**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-012	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.968	Top Dia. (in):	2.004
Length 2 (in):	3.968	Mid. Dia. (in):	2.003
Length 3 (in):	3.967	Bot. Dia. (in):	2.000
Avg. Length (in):	3.968	Area (in^2):	3.149

WATER CONTENT (AFTER TEST)

Tare No.:	2900
Weight of Tare & Wet Sample (g):	406.35
Weight of Tare & Dry Sample (g):	324.29
Weight of Tare (g):	8.09
% Moisture:	25.95

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	399.5	Sample Volume (cm^3):	204.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.95
Weight of Wet Sample (g):	399.46	Unit Wet Weight (pcf):	121.75
Avg. Diameter (in):	2.00	Moisture Content (%):	25.95
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	96.66
Avg. Length (cm):	10.08		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1155	**366.79**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-013	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.993	Top Dia. (in):	2.005
Length 2 (in):	3.994	Mid. Dia. (in):	2.005
Length 3 (in):	3.993	Bot. Dia. (in):	2.002
Avg. Length (in):	3.993	Area (in^2):	3.154

WATER CONTENT (AFTER TEST)

Tare No.:	2949
Weight of Tare & Wet Sample (g):	404.91
Weight of Tare & Dry Sample (g):	323.28
Weight of Tare (g):	8.17
% Moisture:	25.91

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.6	Sample Volume (cm^3):	206.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.95
Weight of Wet Sample (g):	402.55	Unit Wet Weight (pcf):	121.70
Avg. Diameter (in):	2.00	Moisture Content (%):	25.91
Avg. Length (in):	3.99	Unit Dry Weight (pcf):	96.66
Avg. Length (cm):	10.14		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1095	**347.16**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

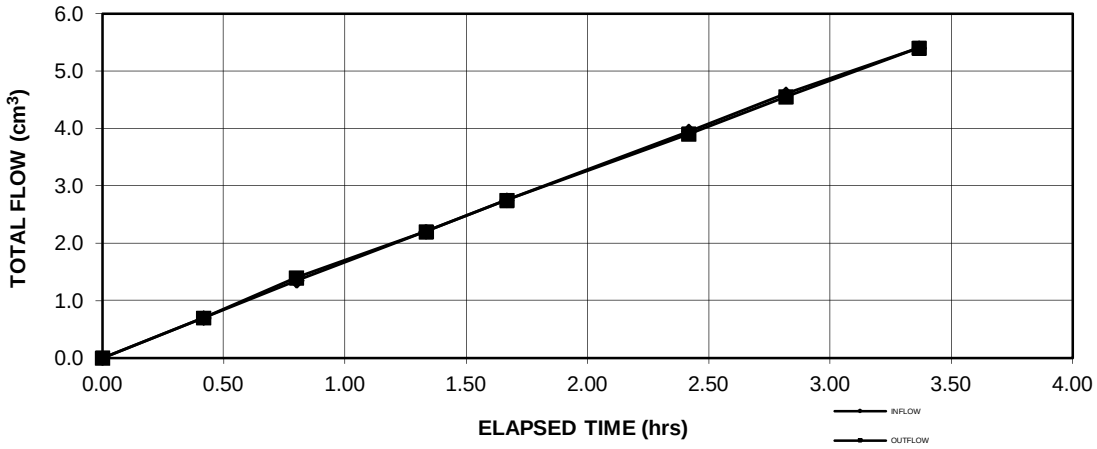
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-014	Avg. Effective Consol. Pressure (psi):	6.25

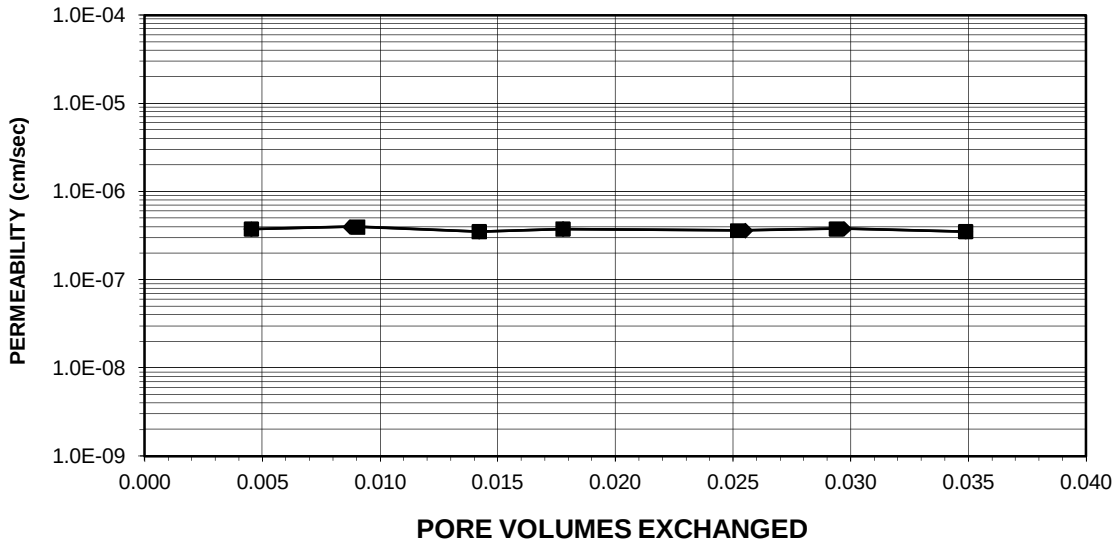
AVERAGE PERMEABILITY = 3.7E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.7E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-014	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1699	897
Weight of Tare & Wet Sample (g)	165.06	785.10
Weight of Tare & Dry Sample (g)	147.89	640.08
Weight of Tare (g)	83.40	109.24
Weight of Water (g)	17.17	145.02
Weight of Dry Sample (g)	64.49	530.84
Moisture Content (%)	**26.6**	**27.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	680.49	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	680.49	684.22
Length 1 (in)	3.086	2.981
Length 2 (in)	2.979	3.081
Length 3 (in)	3.083	3.051
Top Diameter (in)	3.010	3.010
Middle Diameter (in)	3.010	3.010
Bottom Diameter (in)	3.006	3.006
Average Length (in)	3.05	3.04
Average Area (in^2)	7.11	7.11
Sample Volume (cm^3)	355.26	353.90
Unit Wet Weight (g/cm^3)	1.92	1.93
Unit Wet Weight (pcf)	119.6	120.7
Unit Dry Weight (pcf)	94.4	94.8
Unit Dry Weight (g/cm^3)	1.51	1.52
Void Ratio, e	0.78	0.78
Porosity, n	0.44	0.44
Pore Volume (cm^3)	156.2	154.9
Total Weight of Sample After Test (g)		686.17

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-014	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.78

Final Sample Dimensions	
Sample Length (cm), L	7.72
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.87
Inflow Burette Area (cm^2), a-in	0.918
Outflow Burette Area (cm^2), a-out	0.907
B Parameter (%)	97

AVERAGE PERMEABILITY = 3.7E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.7E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/3/23	8	35	0.000	0.0	0.0	201.9	0	21.3	NA
1/3/23	9	0	0.417	0.7	0.7	200.3	0	21.3	3.8E-07
1/3/23	9	23	0.800	1.4	1.4	198.9	0	21.3	4.0E-07
1/3/23	9	55	1.333	2.2	2.2	197.1	0	21.4	3.5E-07
1/3/23	10	15	1.667	2.8	2.8	195.9	0	21.4	3.8E-07
1/3/23	11	0	2.417	4.0	3.9	193.3	0	21.4	3.6E-07
1/3/23	11	24	2.817	4.6	4.6	191.9	0	21.5	3.8E-07
1/3/23	11	57	3.367	5.4	5.4	190.1	1	21.5	3.5E-07

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/4/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

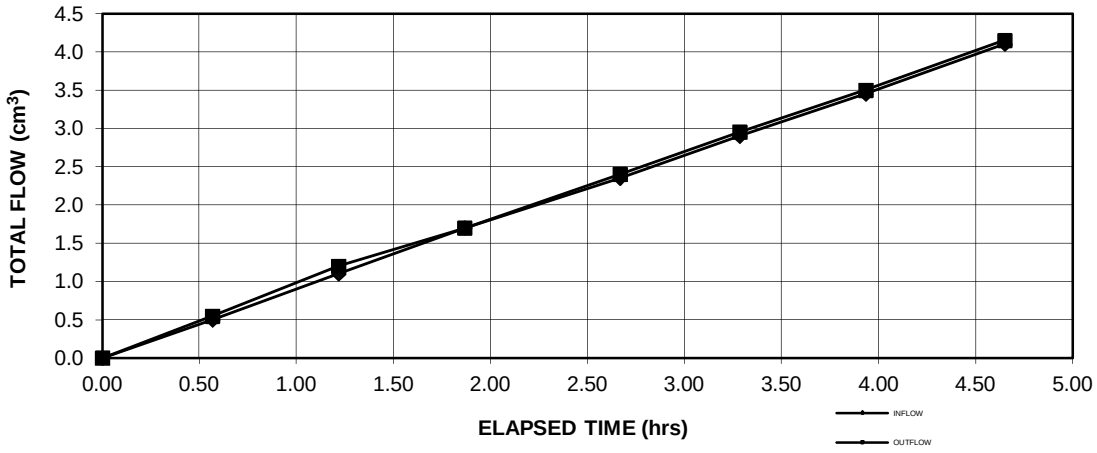
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-015	Avg. Effective Consol. Pressure (psi):	6.25

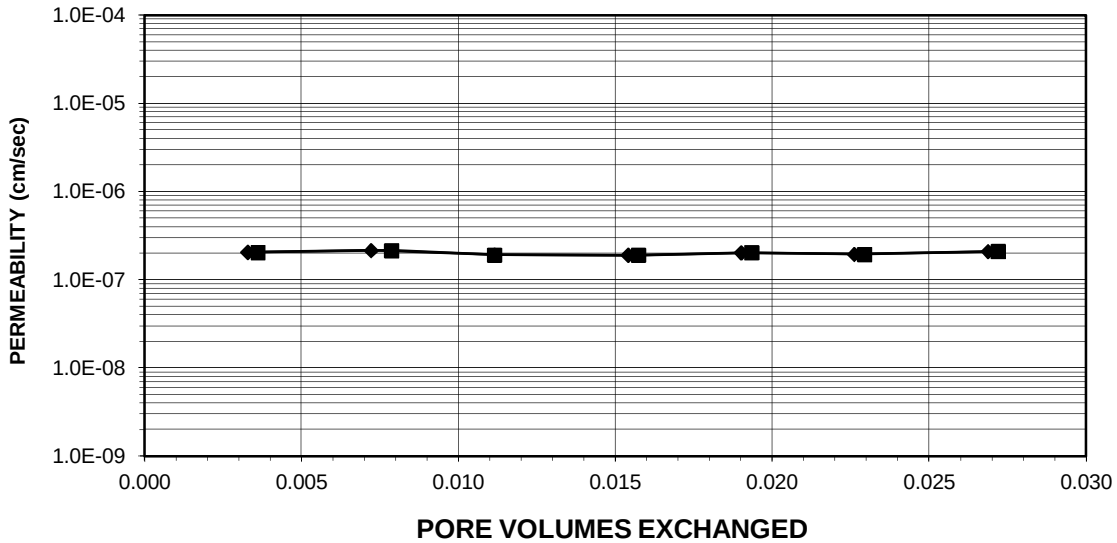
AVERAGE PERMEABILITY = 2.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.0E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-015	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	544	589
Weight of Tare & Wet Sample (g)	180.90	754.11
Weight of Tare & Dry Sample (g)	160.06	607.74
Weight of Tare (g)	84.00	82.48
Weight of Water (g)	20.84	146.37
Weight of Dry Sample (g)	76.06	525.26
Moisture Content (%)	**27.4**	**27.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	671.35	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	671.35	673.81
Length 1 (in)	2.967	2.971
Length 2 (in)	2.993	3.001
Length 3 (in)	2.987	2.989
Top Diameter (in)	3.008	3.004
Middle Diameter (in)	3.005	3.009
Bottom Diameter (in)	3.002	3.010
Average Length (in)	2.98	2.99
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	346.61	347.76
Unit Wet Weight (g/cm^3)	1.94	1.94
Unit Wet Weight (pcf)	120.9	120.9
Unit Dry Weight (pcf)	94.9	94.6
Unit Dry Weight (g/cm^3)	1.52	1.52
Void Ratio, e	0.78	0.78
Porosity, n	0.44	0.44
Pore Volume (cm^3)	151.4	152.6
Total Weight of Sample After Test (g)		677.86

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-015	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.17

Final Sample Dimensions	
Sample Length (cm), L	7.59
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.84
Inflow Burette Area (cm^2), a-in	0.875
Outflow Burette Area (cm^2), a-out	0.974
B Parameter (%)	97

AVERAGE PERMEABILITY = 2.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.0E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	10	0	0.000	0.0	0.0	202.1	0	21.2	NA
1/16/23	10	34	0.567	0.5	0.6	200.9	0	21.2	2.0E-07
1/16/23	11	13	1.217	1.1	1.2	199.6	0	21.2	2.1E-07
1/16/23	11	52	1.867	1.7	1.7	198.4	0	21.2	1.9E-07
1/16/23	12	40	2.667	2.4	2.4	196.9	0	21.2	1.9E-07
1/16/23	13	17	3.283	2.9	3.0	195.7	0	21.2	2.0E-07
1/16/23	13	56	3.933	3.5	3.5	194.5	0	21.1	1.9E-07
1/16/23	14	39	4.650	4.1	4.2	193.1	1	21.1	2.1E-07

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/17/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-016	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.628	Top Dia. (in):	2.012
Length 2 (in):	3.628	Mid. Dia. (in):	2.012
Length 3 (in):	3.626	Bot. Dia. (in):	2.002
Avg. Length (in):	3.627	Area (in^2):	3.169

WATER CONTENT (AFTER TEST)

Tare No.:	3295
Weight of Tare & Wet Sample (g):	359.23
Weight of Tare & Dry Sample (g):	272.32
Weight of Tare (g):	8.13
% Moisture:	32.90

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	352.3	Sample Volume (cm^3):	188.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	352.25	Unit Wet Weight (pcf):	116.69
Avg. Diameter (in):	2.01	Moisture Content (%):	32.90
Avg. Length (in):	3.63	Unit Dry Weight (pcf):	87.81
Avg. Length (cm):	9.21		

ELECTRONIC DEVICE LOAD (lb)	***STRESS (psi)***
1280	**403.93**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-017	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.830	Top Dia. (in):	2.007
Length 2 (in):	3.829	Mid. Dia. (in):	2.005
Length 3 (in):	3.828	Bot. Dia. (in):	2.002
Avg. Length (in):	3.829	Area (in^2):	3.156

WATER CONTENT (AFTER TEST)

Tare No.:	2848
Weight of Tare & Wet Sample (g):	379.27
Weight of Tare & Dry Sample (g):	288.25
Weight of Tare (g):	8.10
% Moisture:	32.49

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	372.5	Sample Volume (cm^3):	198.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.88
Weight of Wet Sample (g):	372.46	Unit Wet Weight (pcf):	117.36
Avg. Diameter (in):	2.00	Moisture Content (%):	32.49
Avg. Length (in):	3.83	Unit Dry Weight (pcf):	88.58
Avg. Length (cm):	9.73		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1315	**416.63**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-018	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.552	Top Dia. (in):	2.010
Length 2 (in):	3.551	Mid. Dia. (in):	2.007
Length 3 (in):	3.551	Bot. Dia. (in):	2.005
Avg. Length (in):	3.551	Area (in^2):	3.165

WATER CONTENT (AFTER TEST)

Tare No.:	3250
Weight of Tare & Wet Sample (g):	350.66
Weight of Tare & Dry Sample (g):	266.84
Weight of Tare (g):	8.10
% Moisture:	32.40

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	343.7	Sample Volume (cm^3):	184.2
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	343.65	Unit Wet Weight (pcf):	116.43
Avg. Diameter (in):	2.01	Moisture Content (%):	32.40
Avg. Length (in):	3.55	Unit Dry Weight (pcf):	87.94
Avg. Length (cm):	9.02		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1840	**581.42**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

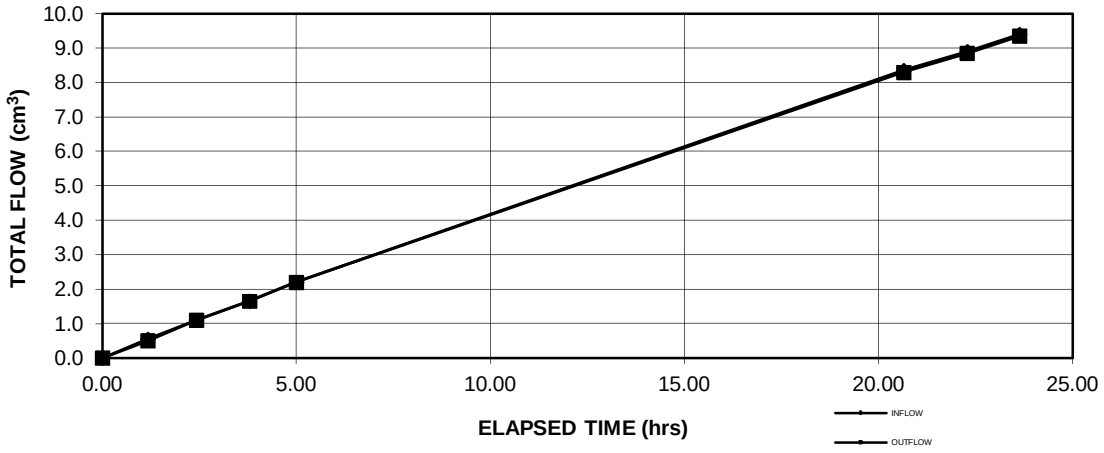
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-019	Avg. Effective Consol. Pressure (psi):	6.25

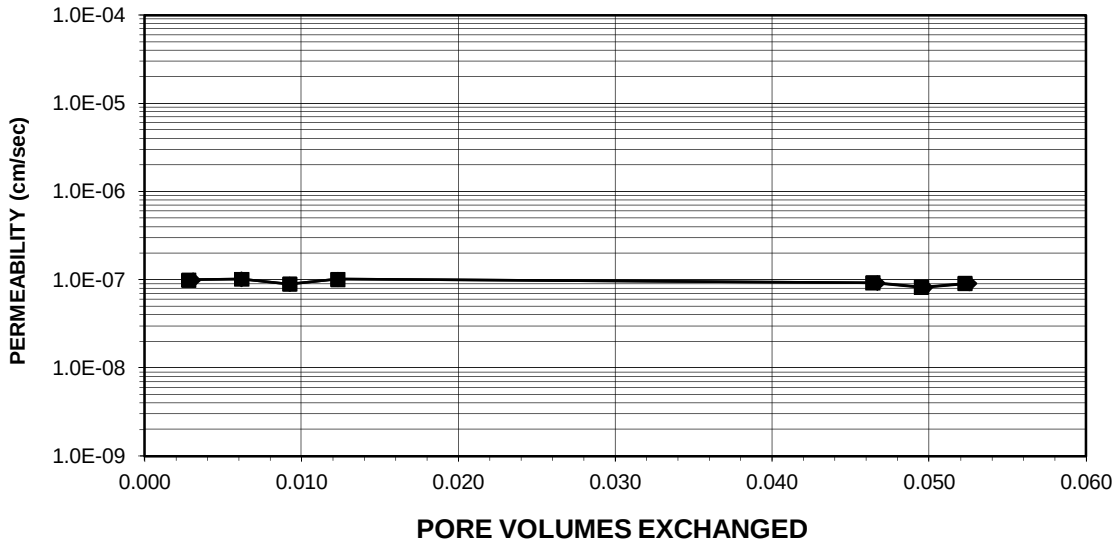
AVERAGE PERMEABILITY = 9.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-019	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	606	893
Weight of Tare & Wet Sample (g)	258.08	750.83
Weight of Tare & Dry Sample (g)	209.45	586.50
Weight of Tare (g)	84.91	110.31
Weight of Water (g)	48.63	164.33
Weight of Dry Sample (g)	124.54	476.19
Moisture Content (%)	**39.0**	**34.5**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	644.59	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	644.59	623.55
Length 1 (in)	3.048	2.984
Length 2 (in)	2.972	3.056
Length 3 (in)	3.047	2.985
Top Diameter (in)	3.010	3.010
Middle Diameter (in)	3.014	3.012
Bottom Diameter (in)	3.019	3.005
Average Length (in)	3.02	3.01
Average Area (in^2)	7.14	7.11
Sample Volume (cm^3)	353.44	350.56
Unit Wet Weight (g/cm^3)	1.82	1.78
Unit Wet Weight (pcf)	113.8	111.0
Unit Dry Weight (pcf)	81.9	82.5
Unit Dry Weight (g/cm^3)	1.31	1.32
Void Ratio, e	1.06	1.04
Porosity, n	0.51	0.51
Pore Volume (cm^3)	181.7	178.9
Total Weight of Sample After Test (g)		648.55

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-019	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.00

Final Sample Dimensions	
Sample Length (cm), L	7.64
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.88
Inflow Burette Area (cm^2), a-in	0.860
Outflow Burette Area (cm^2), a-out	0.888
B Parameter (%)	96

AVERAGE PERMEABILITY = 9.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/3/23	10	13	0.000	0.0	0.0	203.2	0	21.4	NA
1/3/23	11	23	1.167	0.6	0.5	202.0	0	21.5	9.9E-08
1/3/23	12	38	2.417	1.1	1.1	200.6	0	21.6	1.0E-07
1/3/23	14	0	3.783	1.7	1.7	199.4	0	21.7	8.9E-08
1/3/23	15	13	5.000	2.2	2.2	198.1	0	21.7	1.0E-07
1/4/23	6	52	20.650	8.4	8.3	184.1	0	21.2	9.2E-08
1/4/23	8	30	22.283	8.9	8.9	182.9	0	21.3	8.2E-08
1/4/23	9	51	23.633	9.4	9.4	181.7	1	21.4	9.1E-08

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

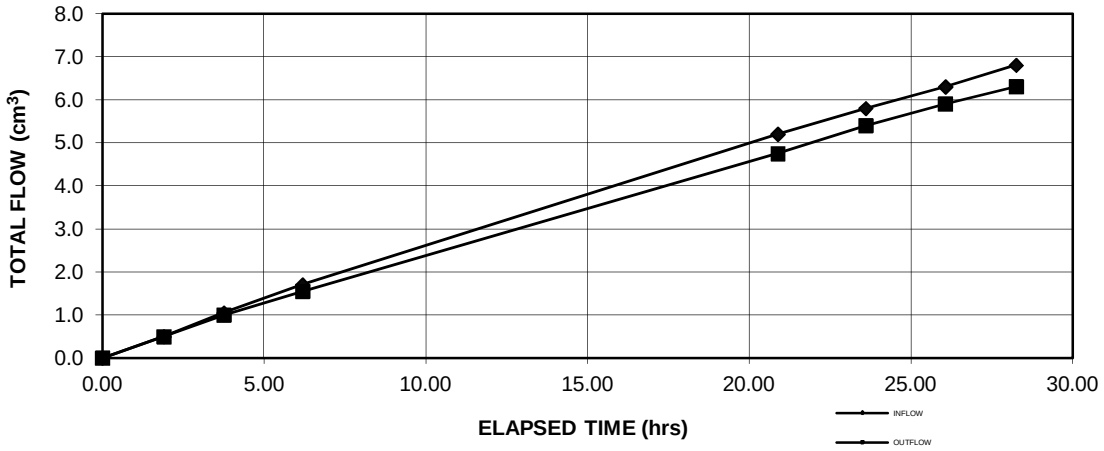
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-020	Avg. Effective Consol. Pressure (psi):	6.25

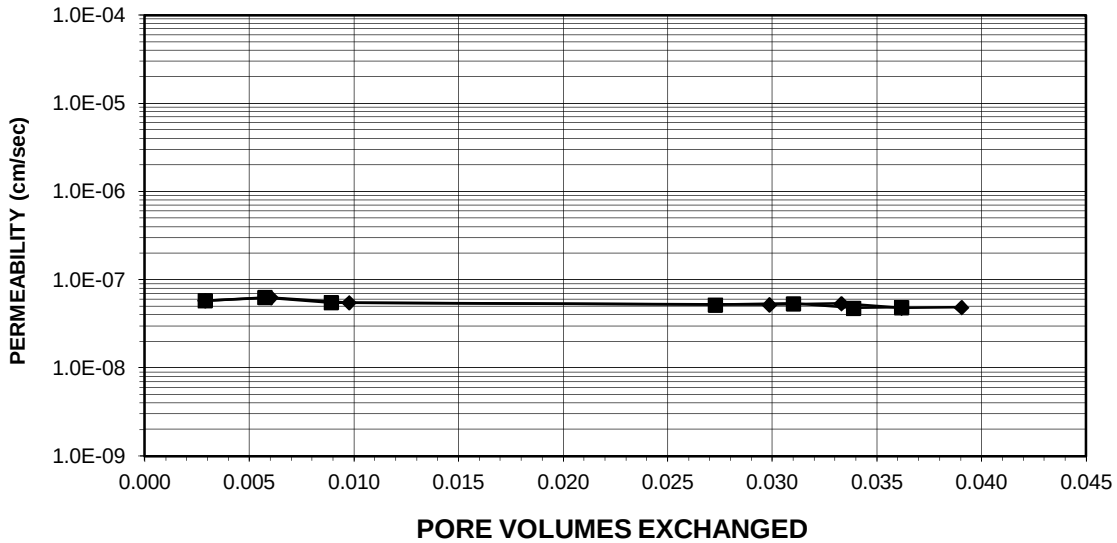
AVERAGE PERMEABILITY = 5.0E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.0E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-020	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	629	874
Weight of Tare & Wet Sample (g)	207.82	756.57
Weight of Tare & Dry Sample (g)	173.75	594.84
Weight of Tare (g)	85.75	109.89
Weight of Water (g)	34.07	161.73
Weight of Dry Sample (g)	88.00	484.95
Moisture Content (%)	**38.7**	**33.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	648.88	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	648.88	623.78
Length 1 (in)	2.976	2.967
Length 2 (in)	3.034	3.023
Length 3 (in)	2.971	2.965
Top Diameter (in)	3.008	3.010
Middle Diameter (in)	3.007	3.008
Bottom Diameter (in)	3.005	3.004
Average Length (in)	2.99	2.99
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	348.31	347.45
Unit Wet Weight (g/cm^3)	1.86	1.80
Unit Wet Weight (pcf)	116.3	112.1
Unit Dry Weight (pcf)	83.8	84.0
Unit Dry Weight (g/cm^3)	1.34	1.35
Void Ratio, e	1.01	1.01
Porosity, n	0.50	0.50
Pore Volume (cm^3)	175.1	174.2
Total Weight of Sample After Test (g)		652.63

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-1-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-020	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.18

Final Sample Dimensions	
Sample Length (cm), L	7.58
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.83
Inflow Burette Area (cm^2), a-in	0.918
Outflow Burette Area (cm^2), a-out	0.907
B Parameter (%)	95

AVERAGE PERMEABILITY = 5.0E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.0E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	9	59	0.000	0.0	0.0	201.9	0	21.2	NA
1/16/23	11	53	1.900	0.5	0.5	200.8	0	21.2	5.8E-08
1/16/23	13	44	3.750	1.1	1.0	199.6	0	21.2	6.3E-08
1/16/23	16	10	6.183	1.7	1.6	198.3	0	21.1	5.5E-08
1/17/23	6	52	20.883	5.2	4.8	191.0	0	21.2	5.2E-08
1/17/23	9	35	23.600	5.8	5.4	189.7	0	21.3	5.4E-08
1/17/23	12	3	26.067	6.3	5.9	188.6	0	21.2	4.8E-08
1/17/23	14	14	28.250	6.8	6.3	187.6	1	21.3	4.8E-08

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-021	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.898	Top Dia. (in):	2.007
Length 2 (in):	3.897	Mid. Dia. (in):	2.005
Length 3 (in):	3.896	Bot. Dia. (in):	2.004
Avg. Length (in):	3.897	Area (in^2):	3.158

WATER CONTENT (AFTER TEST)

Tare No.:	3230
Weight of Tare & Wet Sample (g):	398.03
Weight of Tare & Dry Sample (g):	315.13
Weight of Tare (g):	8.14
% Moisture:	27.00

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	391.1	Sample Volume (cm^3):	201.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	391.09	Unit Wet Weight (pcf):	120.99
Avg. Diameter (in):	2.01	Moisture Content (%):	27.00
Avg. Length (in):	3.90	Unit Dry Weight (pcf):	95.27
Avg. Length (cm):	9.90		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
825	**261.21**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-022	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.023	Top Dia. (in):	2.009
Length 2 (in):	4.022	Mid. Dia. (in):	2.005
Length 3 (in):	4.021	Bot. Dia. (in):	2.001
Avg. Length (in):	4.022	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3376
Weight of Tare & Wet Sample (g):	409.09
Weight of Tare & Dry Sample (g):	324.96
Weight of Tare (g):	8.20
% Moisture:	26.56

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.3	Sample Volume (cm^3):	208.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	402.3	Unit Wet Weight (pcf):	120.63
Avg. Diameter (in):	2.01	Moisture Content (%):	26.56
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	95.32
Avg. Length (cm):	10.22		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1030	**326.23**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-023	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.018	Top Dia. (in):	2.008
Length 2 (in):	4.018	Mid. Dia. (in):	2.005
Length 3 (in):	4.016	Bot. Dia. (in):	2.002
Avg. Length (in):	4.017	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3303
Weight of Tare & Wet Sample (g):	408.57
Weight of Tare & Dry Sample (g):	324.89
Weight of Tare (g):	8.08
% Moisture:	26.41

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.8	Sample Volume (cm^3):	207.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	402.76	Unit Wet Weight (pcf):	120.91
Avg. Diameter (in):	2.01	Moisture Content (%):	26.41
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	95.65
Avg. Length (cm):	10.20		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1345	**425.99**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

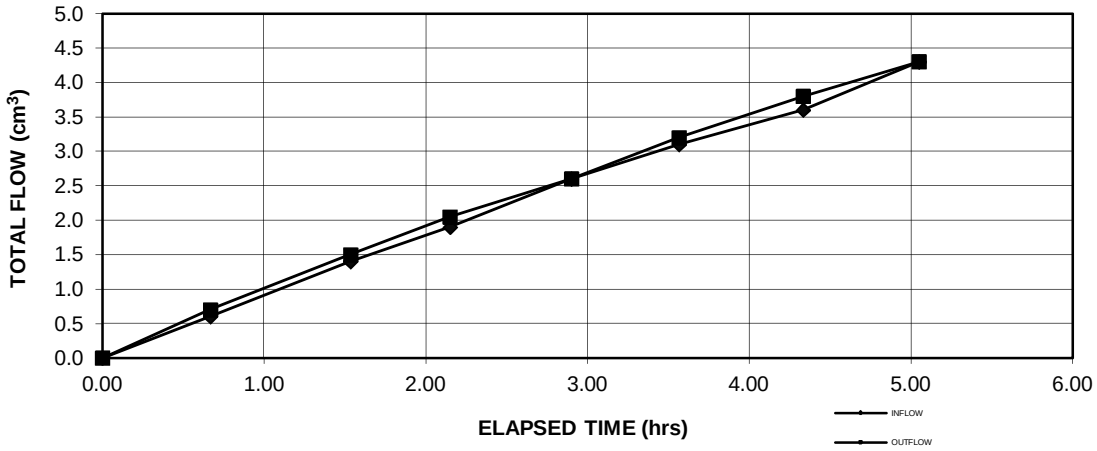
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-024	Avg. Effective Consol. Pressure (psi):	6.25

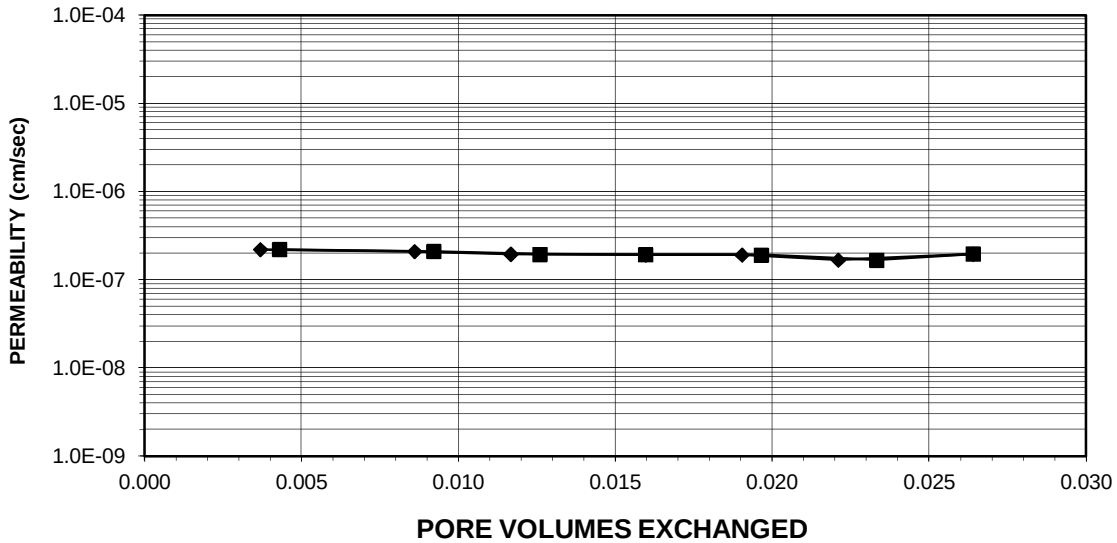
AVERAGE PERMEABILITY = 1.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.9E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-024	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1694	1718
Weight of Tare & Wet Sample (g)	248.88	758.19
Weight of Tare & Dry Sample (g)	212.34	609.57
Weight of Tare (g)	83.07	81.52
Weight of Water (g)	36.54	148.62
Weight of Dry Sample (g)	129.27	528.05
Moisture Content (%)	**28.3**	**28.1**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	676.36	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	676.36	675.72
Length 1 (in)	2.976	3.010
Length 2 (in)	3.062	3.078
Length 3 (in)	2.992	3.019
Top Diameter (in)	3.016	3.065
Middle Diameter (in)	3.010	3.007
Bottom Diameter (in)	3.002	3.012
Average Length (in)	3.01	3.04
Average Area (in^2)	7.11	7.20
Sample Volume (cm^3)	350.83	358.23
Unit Wet Weight (g/cm^3)	1.93	1.89
Unit Wet Weight (pcf)	120.3	117.7
Unit Dry Weight (pcf)	93.8	91.9
Unit Dry Weight (g/cm^3)	1.50	1.47
Void Ratio, e	0.80	0.83
Porosity, n	0.44	0.45
Pore Volume (cm^3)	155.5	162.9
Total Weight of Sample After Test (g)		681.81

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-024	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.79

Final Sample Dimensions	
Sample Length (cm), L	7.71
Sample Diameter (cm)	7.69
Sample Area (cm^2), A	46.46
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	99

AVERAGE PERMEABILITY = 1.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.9E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	9	38	0.000	0.0	0.0	196.8	0	21.3	NA
1/4/23	10	18	0.667	0.6	0.7	195.4	0	21.4	2.2E-07
1/4/23	11	10	1.533	1.4	1.5	193.8	0	21.5	2.1E-07
1/4/23	11	47	2.150	1.9	2.1	192.7	0	21.5	1.9E-07
1/4/23	12	32	2.900	2.6	2.6	191.4	0	21.5	1.9E-07
1/4/23	13	12	3.567	3.1	3.2	190.2	0	21.6	1.9E-07
1/4/23	13	58	4.333	3.6	3.8	189.1	0	21.7	1.7E-07
1/4/23	14	41	5.050	4.3	4.3	187.9	1	21.8	1.9E-07

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

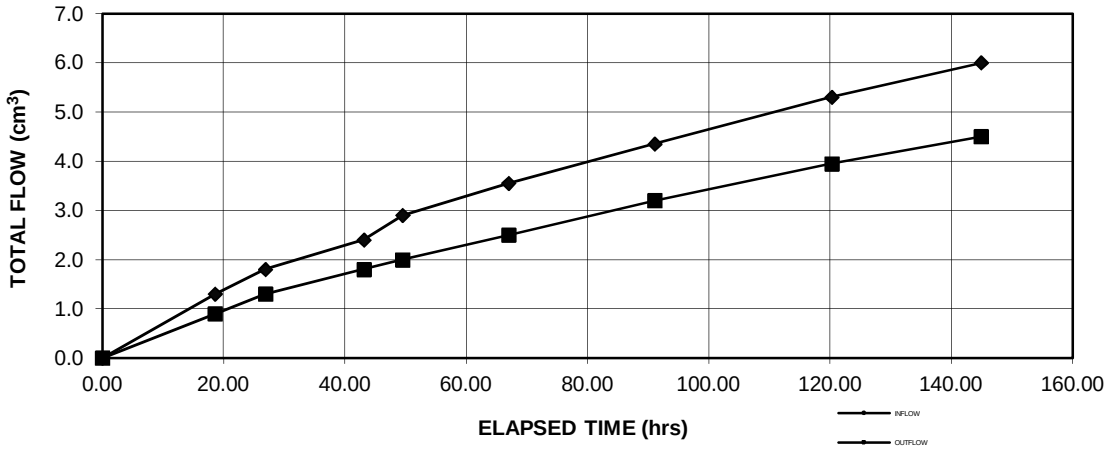
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-025	Avg. Effective Consol. Pressure (psi):	6.25

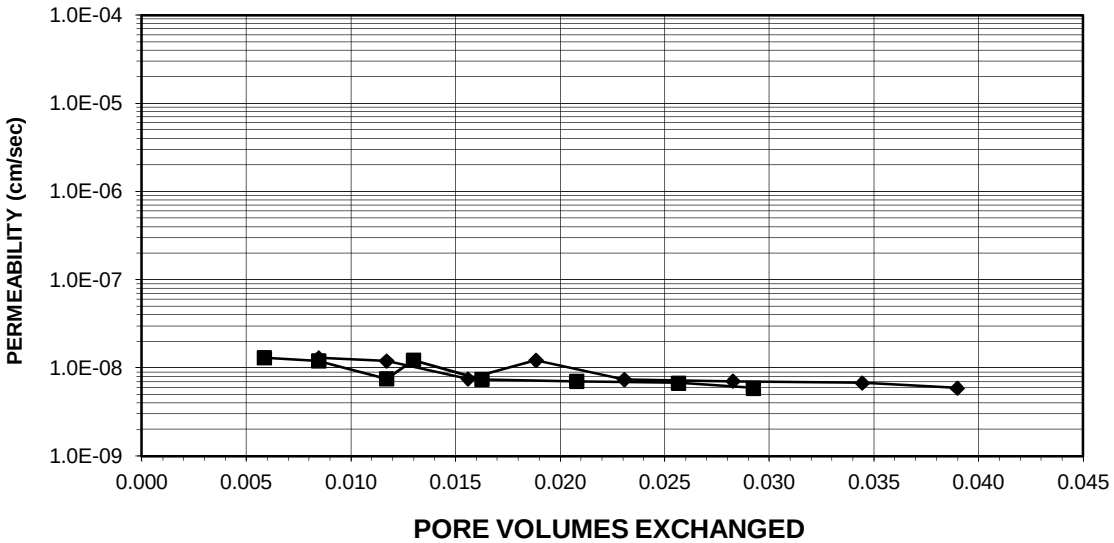
AVERAGE PERMEABILITY = 6.8E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.8E-11 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-025	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	586	916
Weight of Tare & Wet Sample (g)	242.16	776.97
Weight of Tare & Dry Sample (g)	206.23	631.33
Weight of Tare (g)	81.64	109.52
Weight of Water (g)	35.93	145.64
Weight of Dry Sample (g)	124.59	521.81
Moisture Content (%)	**28.8**	**27.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	667.93	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	667.93	663.12
Length 1 (in)	3.021	3.001
Length 2 (in)	2.968	2.988
Length 3 (in)	2.963	2.941
Top Diameter (in)	3.008	3.001
Middle Diameter (in)	3.007	3.006
Bottom Diameter (in)	3.009	3.008
Average Length (in)	2.98	2.98
Average Area (in^2)	7.11	7.09
Sample Volume (cm^3)	347.49	345.95
Unit Wet Weight (g/cm^3)	1.92	1.92
Unit Wet Weight (pcf)	120.0	119.7
Unit Dry Weight (pcf)	93.1	93.5
Unit Dry Weight (g/cm^3)	1.49	1.50
Void Ratio, e	0.81	0.80
Porosity, n	0.45	0.44
Pore Volume (cm^3)	155.5	153.9
Total Weight of Sample After Test (g)		673.25

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/24/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-025	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.25

Final Sample Dimensions	
Sample Length (cm), L	7.56
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.76
Inflow Burette Area (cm^2), a-in	0.852
Outflow Burette Area (cm^2), a-out	0.862
B Parameter (%)	99

AVERAGE PERMEABILITY = 6.8E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.8E-11 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	12	14	0.000	0.0	0.0	203.7	0	21.2	NA
1/17/23	6	49	18.583	1.3	0.9	201.1	0	21.2	1.3E-08
1/17/23	15	7	26.883	1.8	1.3	200.1	0	21.3	1.2E-08
1/18/23	7	22	43.133	2.4	1.8	198.8	0	21.3	7.5E-09
1/18/23	13	45	49.517	2.9	2.0	198.0	0	21.5	1.2E-08
1/19/23	7	13	66.983	3.6	2.5	196.7	0	21.2	7.4E-09
1/20/23	7	20	91.100	4.4	3.2	194.9	0	21.2	7.1E-09
1/21/23	12	31	120.283	5.3	4.0	192.9	0	20.9	6.7E-09
1/22/23	13	8	144.900	6.0	4.5	191.5	1	21.0	5.9E-09

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-026	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.012	Top Dia. (in):	2.010
Length 2 (in):	4.011	Mid. Dia. (in):	2.008
Length 3 (in):	4.010	Bot. Dia. (in):	2.004
Avg. Length (in):	4.011	Area (in^2):	3.165

WATER CONTENT (AFTER TEST)

Tare No.:	2853
Weight of Tare & Wet Sample (g):	409.40
Weight of Tare & Dry Sample (g):	323.21
Weight of Tare (g):	8.09
% Moisture:	27.35

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.4	Sample Volume (cm^3):	208.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.93
Weight of Wet Sample (g):	402.4	Unit Wet Weight (pcf):	120.71
Avg. Diameter (in):	2.01	Moisture Content (%):	27.35
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	94.79
Avg. Length (cm):	10.19		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1060	**334.95**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-027	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.013	Top Dia. (in):	2.005
Length 2 (in):	4.012	Mid. Dia. (in):	2.003
Length 3 (in):	4.010	Bot. Dia. (in):	2.000
Avg. Length (in):	4.012	Area (in^2):	3.150

WATER CONTENT (AFTER TEST)

Tare No.:	2849
Weight of Tare & Wet Sample (g):	408.60
Weight of Tare & Dry Sample (g):	323.96
Weight of Tare (g):	8.28
% Moisture:	26.81

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	401.8	Sample Volume (cm^3):	207.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	401.76	Unit Wet Weight (pcf):	121.06
Avg. Diameter (in):	2.00	Moisture Content (%):	26.81
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	95.47
Avg. Length (cm):	10.19		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1515	**480.96**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-028	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.008	Top Dia. (in):	2.008
Length 2 (in):	4.007	Mid. Dia. (in):	2.006
Length 3 (in):	4.007	Bot. Dia. (in):	2.004
Avg. Length (in):	4.007	Area (in^2):	3.160

WATER CONTENT (AFTER TEST)

Tare No.:	3182
Weight of Tare & Wet Sample (g):	407.90
Weight of Tare & Dry Sample (g):	323.32
Weight of Tare (g):	8.09
% Moisture:	26.83

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	401.8	Sample Volume (cm^3):	207.5
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	401.83	Unit Wet Weight (pcf):	120.81
Avg. Diameter (in):	2.01	Moisture Content (%):	26.83
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	95.26
Avg. Length (cm):	10.18		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1705	**539.48**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

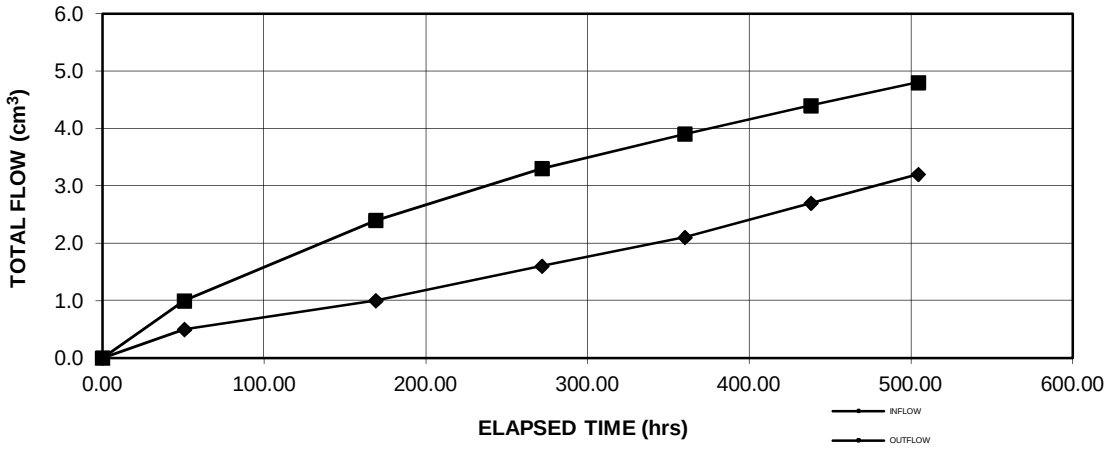
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-029	Avg. Effective Consol. Pressure (psi):	6.25

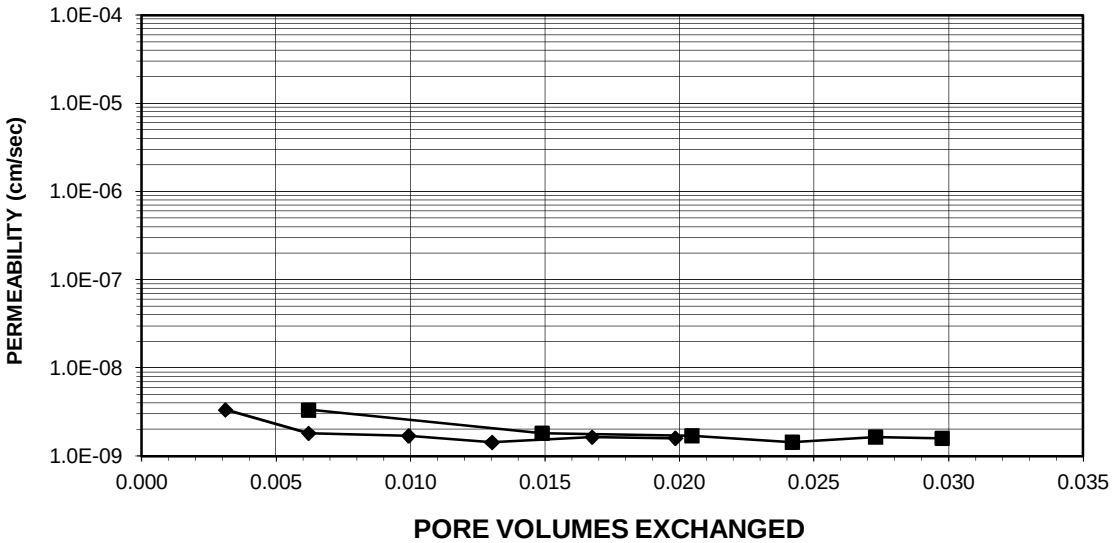
AVERAGE PERMEABILITY = 1.6E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.6E-11 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/26/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-029	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1692	1741
Weight of Tare & Wet Sample (g)	270.27	758.87
Weight of Tare & Dry Sample (g)	227.50	608.49
Weight of Tare (g)	82.11	82.63
Weight of Water (g)	42.77	150.38
Weight of Dry Sample (g)	145.39	525.86
Moisture Content (%)	**29.4**	**28.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	677.13	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	677.13	672.84
Length 1 (in)	3.076	3.063
Length 2 (in)	3.041	3.011
Length 3 (in)	3.068	3.076
Top Diameter (in)	3.005	3.010
Middle Diameter (in)	3.008	3.011
Bottom Diameter (in)	3.004	3.002
Average Length (in)	3.06	3.05
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	355.98	355.10
Unit Wet Weight (g/cm^3)	1.90	1.89
Unit Wet Weight (pcf)	118.7	118.3
Unit Dry Weight (pcf)	91.7	92.0
Unit Dry Weight (g/cm^3)	1.47	1.47
Void Ratio, e	0.84	0.83
Porosity, n	0.46	0.45
Pore Volume (cm^3)	162.2	161.3
Total Weight of Sample After Test (g)		681.06

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/26/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-029	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.69

Final Sample Dimensions	
Sample Length (cm), L	7.75
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.84
Inflow Burette Area (cm^2), a-in	0.921
Outflow Burette Area (cm^2), a-out	0.922
B Parameter (%)	95

AVERAGE PERMEABILITY = 1.6E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.6E-11 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	6	59	0.000	0.0	0.0	201.7	0	21.2	NA
1/6/23	9	36	50.617	0.5	1.0	200.0	0	21.1	3.3E-09
1/11/23	7	59	169.000	1.0	2.4	198.0	0	21.2	1.8E-09
1/15/23	14	40	271.683	1.6	3.3	196.4	0	20.6	1.7E-09
1/19/23	7	8	360.150	2.1	3.9	195.2	0	21.2	1.4E-09
1/22/23	13	11	438.200	2.7	4.4	194.0	0	21.0	1.6E-09
1/25/23	7	28	504.483	3.2	4.8	193.1	1	20.9	1.6E-09

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/26/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

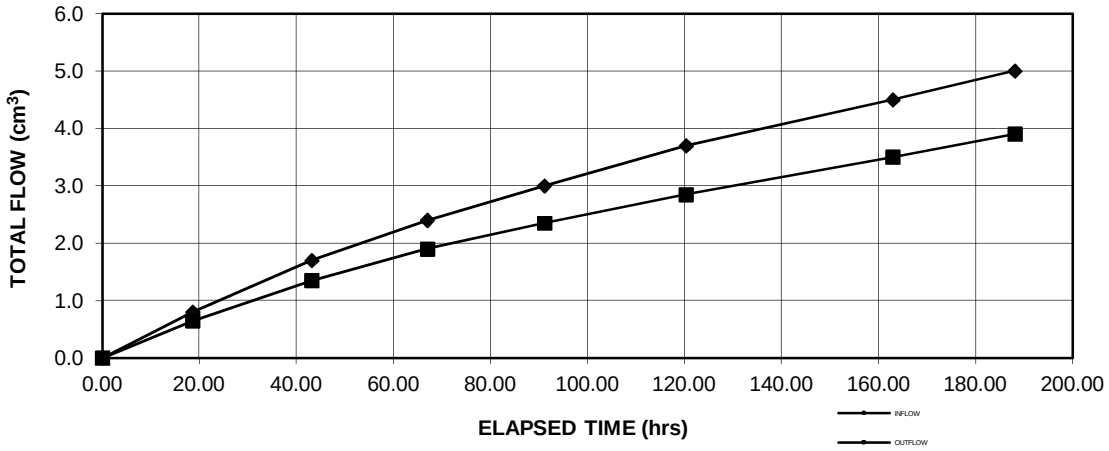
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-030	Avg. Effective Consol. Pressure (psi):	6.25

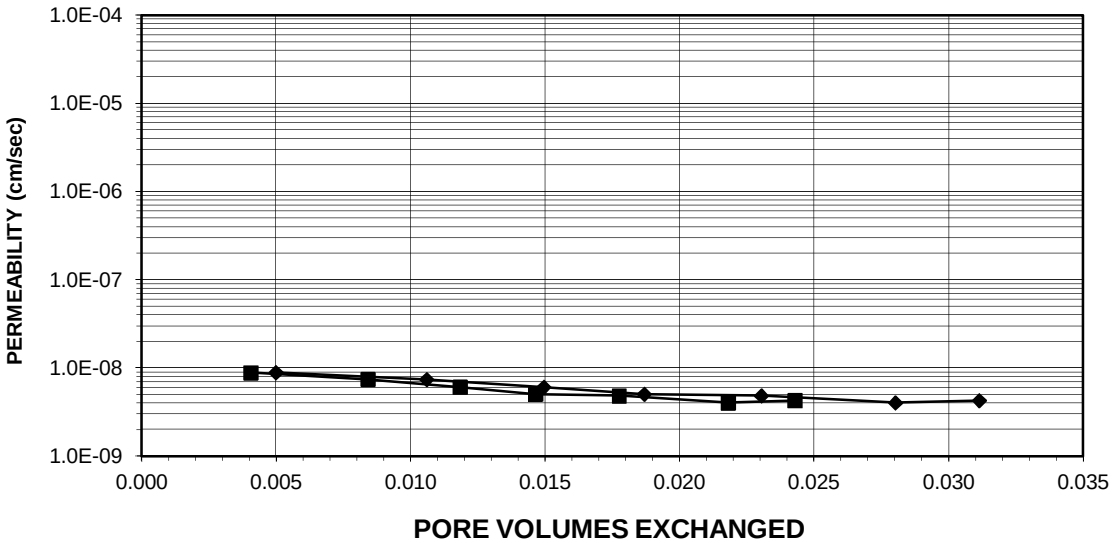
AVERAGE PERMEABILITY = 4.5E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 4.5E-11 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/25/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-030	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	595	912
Weight of Tare & Wet Sample (g)	189.75	784.36
Weight of Tare & Dry Sample (g)	165.20	637.40
Weight of Tare (g)	86.54	110.13
Weight of Water (g)	24.55	146.96
Weight of Dry Sample (g)	78.66	527.27
Moisture Content (%)	**31.2**	**27.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	679.54	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	679.54	662.25
Length 1 (in)	3.020	3.045
Length 2 (in)	3.058	3.038
Length 3 (in)	3.033	3.010
Top Diameter (in)	3.011	3.007
Middle Diameter (in)	3.008	3.006
Bottom Diameter (in)	3.000	3.004
Average Length (in)	3.04	3.03
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	353.27	352.42
Unit Wet Weight (g/cm^3)	1.92	1.88
Unit Wet Weight (pcf)	120.1	117.3
Unit Dry Weight (pcf)	91.5	91.7
Unit Dry Weight (g/cm^3)	1.47	1.47
Void Ratio, e	0.84	0.84
Porosity, n	0.46	0.46
Pore Volume (cm^3)	161.5	160.6
Total Weight of Sample After Test (g)		682.25

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/25/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-030	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.83

Final Sample Dimensions	
Sample Length (cm), L	7.70
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.78
Inflow Burette Area (cm^2), a-in	0.936
Outflow Burette Area (cm^2), a-out	0.972
B Parameter (%)	98

AVERAGE PERMEABILITY = 4.5E-09 cm/sec @ 20°C

AVERAGE PERMEABILITY = 4.5E-11 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	12	14	0.000	0.0	0.0	200.9	0	21.2	NA
1/17/23	6	49	18.583	0.8	0.6	199.3	0	21.2	8.8E-09
1/18/23	7	23	43.150	1.7	1.4	197.7	0	21.3	7.4E-09
1/19/23	7	12	66.967	2.4	1.9	196.4	0	21.2	6.0E-09
1/20/23	7	19	91.083	3.0	2.4	195.3	0	21.2	5.0E-09
1/21/23	12	32	120.300	3.7	2.9	194.0	0	20.9	4.8E-09
1/23/23	7	10	162.933	4.5	3.5	192.5	0	20.9	4.0E-09
1/24/23	8	20	188.100	5.0	3.9	191.5	1	20.8	4.3E-09

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/25/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-031	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.024	Top Dia. (in):	2.009
Length 2 (in):	4.025	Mid. Dia. (in):	2.007
Length 3 (in):	4.025	Bot. Dia. (in):	2.004
Avg. Length (in):	4.025	Area (in^2):	3.163

WATER CONTENT (AFTER TEST)

Tare No.:	3023
Weight of Tare & Wet Sample (g):	403.62
Weight of Tare & Dry Sample (g):	320.57
Weight of Tare (g):	8.19
% Moisture:	26.59

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	401.2	Sample Volume (cm^3):	208.6
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.92
Weight of Wet Sample (g):	401.15	Unit Wet Weight (pcf):	120.01
Avg. Diameter (in):	2.01	Moisture Content (%):	26.59
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	94.81
Avg. Length (cm):	10.22		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1535	**485.36**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-032	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.020	Top Dia. (in):	2.005
Length 2 (in):	4.019	Mid. Dia. (in):	2.003
Length 3 (in):	4.019	Bot. Dia. (in):	1.995
Avg. Length (in):	4.019	Area (in^2):	3.145

WATER CONTENT (AFTER TEST)

Tare No.:	3342
Weight of Tare & Wet Sample (g):	402.04
Weight of Tare & Dry Sample (g):	319.42
Weight of Tare (g):	8.15
% Moisture:	26.54

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	397.2	Sample Volume (cm^3):	207.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.92
Weight of Wet Sample (g):	397.17	Unit Wet Weight (pcf):	119.65
Avg. Diameter (in):	2.00	Moisture Content (%):	26.54
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	94.55
Avg. Length (cm):	10.21		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
2300	**731.38**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-033	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.040	Top Dia. (in):	2.008
Length 2 (in):	4.039	Mid. Dia. (in):	2.006
Length 3 (in):	4.039	Bot. Dia. (in):	2.000
Avg. Length (in):	4.039	Area (in^2):	3.156

WATER CONTENT (AFTER TEST)

Tare No.:	2886
Weight of Tare & Wet Sample (g):	403.39
Weight of Tare & Dry Sample (g):	320.16
Weight of Tare (g):	8.12
% Moisture:	26.67

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	397.9	Sample Volume (cm^3):	208.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.90
Weight of Wet Sample (g):	397.91	Unit Wet Weight (pcf):	118.85
Avg. Diameter (in):	2.00	Moisture Content (%):	26.67
Avg. Length (in):	4.04	Unit Dry Weight (pcf):	93.82
Avg. Length (cm):	10.26		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
2820	**893.46**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

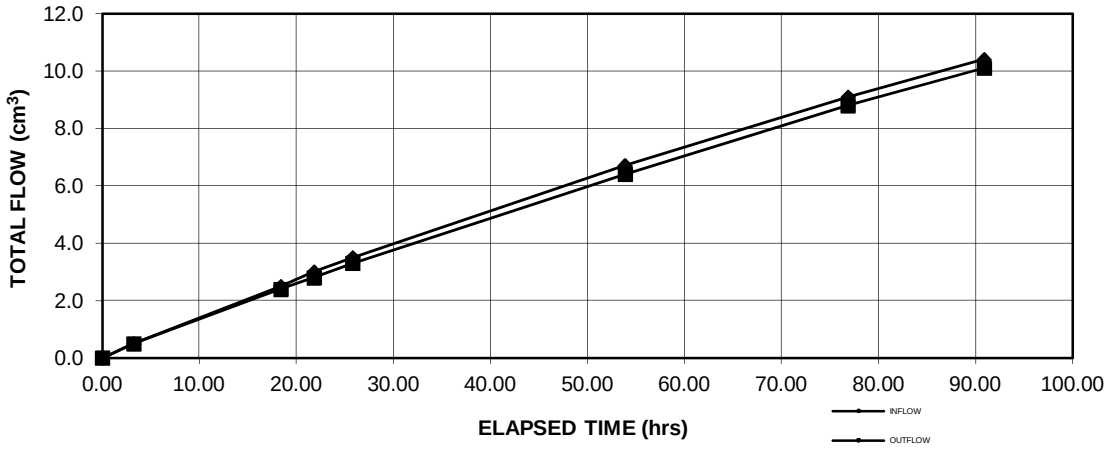
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-034	Avg. Effective Consol. Pressure (psi):	6.25

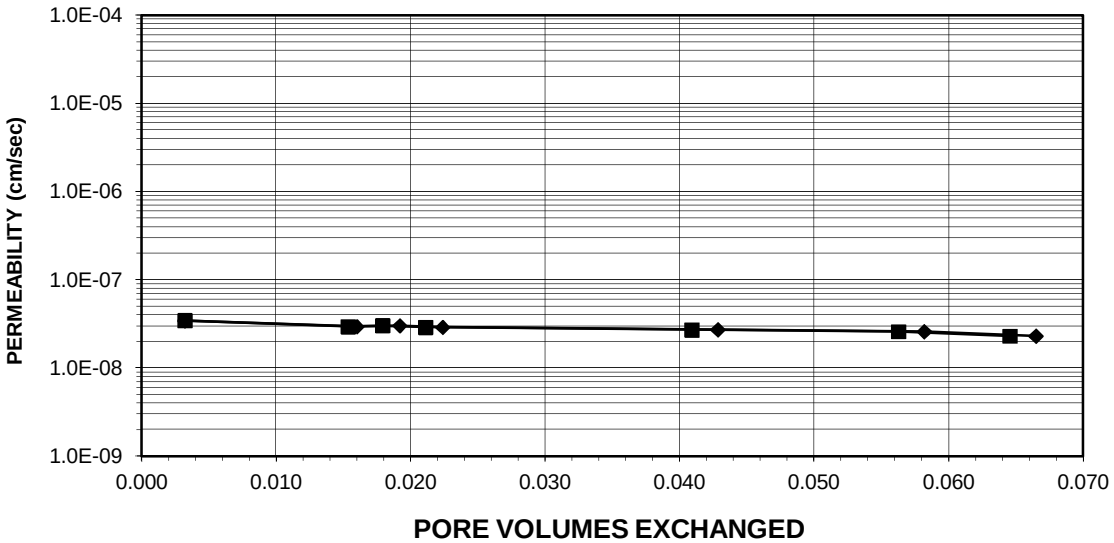
AVERAGE PERMEABILITY = 2.6E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.6E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/10/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-034	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1743	1696
Weight of Tare & Wet Sample (g)	207.98	730.02
Weight of Tare & Dry Sample (g)	179.19	587.00
Weight of Tare (g)	83.30	82.64
Weight of Water (g)	28.79	143.02
Weight of Dry Sample (g)	95.89	504.36
Moisture Content (%)	**30.0**	**28.4**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	652.56	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	652.56	644.19
Length 1 (in)	2.959	2.974
Length 2 (in)	2.920	2.956
Length 3 (in)	2.973	2.902
Top Diameter (in)	3.011	3.008
Middle Diameter (in)	3.007	3.007
Bottom Diameter (in)	3.004	3.002
Average Length (in)	2.95	2.94
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	343.46	342.30
Unit Wet Weight (g/cm^3)	1.90	1.88
Unit Wet Weight (pcf)	118.6	117.5
Unit Dry Weight (pcf)	91.2	91.5
Unit Dry Weight (g/cm^3)	1.46	1.47
Void Ratio, e	0.85	0.84
Porosity, n	0.46	0.46
Pore Volume (cm^3)	157.6	156.4
Total Weight of Sample After Test (g)		661.76

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/10/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-034	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.50

Final Sample Dimensions	
Sample Length (cm), L	7.48
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.78
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 2.6E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.6E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/5/23	12	50	0.000	0.0	0.0	196.8	0	21.4	NA
1/5/23	16	4	3.233	0.5	0.5	195.7	0	21.5	3.4E-08
1/6/23	7	12	18.367	2.5	2.4	191.7	0	20.9	2.9E-08
1/6/23	10	38	21.800	3.0	2.8	190.8	0	21.0	3.0E-08
1/6/23	14	38	25.800	3.5	3.3	189.7	0	21.1	2.9E-08
1/7/23	18	41	53.850	6.7	6.4	183.2	0	20.1	2.7E-08
1/8/23	17	41	76.850	9.1	8.8	178.3	0	20.4	2.6E-08
1/9/23	7	43	90.883	10.4	10.1	175.6	1	21.2	2.3E-08

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/10/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

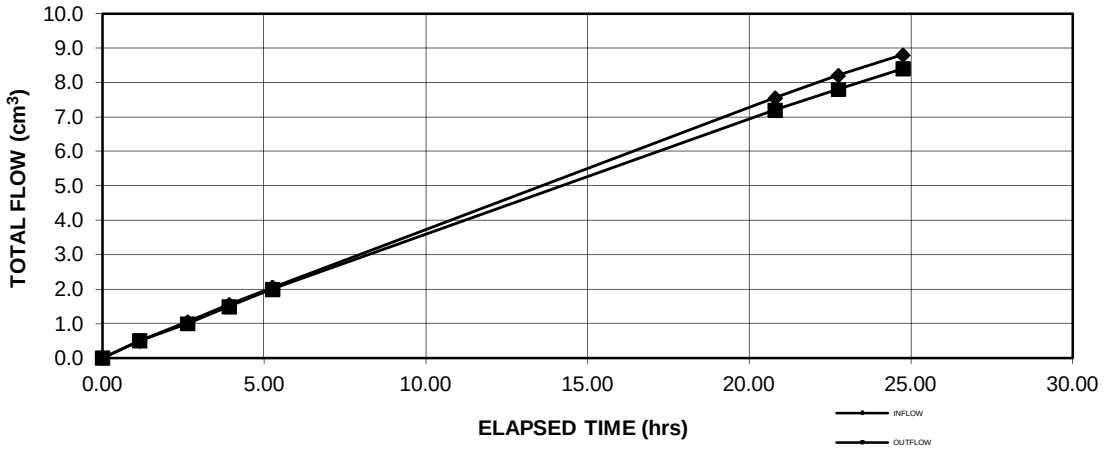
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-035	Avg. Effective Consol. Pressure (psi):	6.25

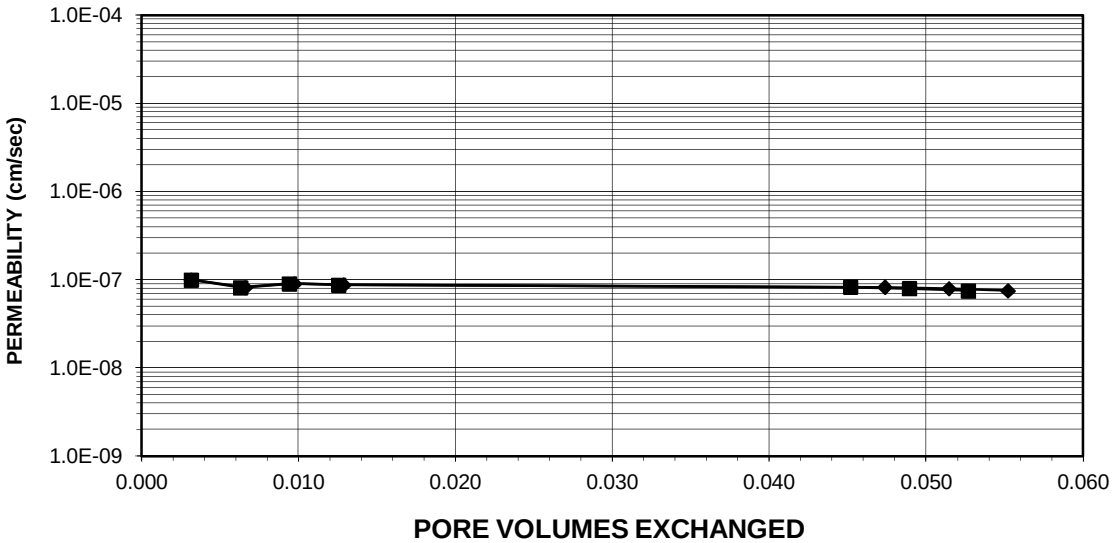
AVERAGE PERMEABILITY = 8.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-035	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	566	7
Weight of Tare & Wet Sample (g)	220.51	737.29
Weight of Tare & Dry Sample (g)	189.09	590.63
Weight of Tare (g)	84.31	74.37
Weight of Water (g)	31.42	146.66
Weight of Dry Sample (g)	104.78	516.26
Moisture Content (%)	**30.0**	**28.4**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	669.90	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	669.90	661.77
Length 1 (in)	3.010	3.014
Length 2 (in)	3.019	3.002
Length 3 (in)	3.000	3.016
Top Diameter (in)	3.004	3.004
Middle Diameter (in)	3.007	3.008
Bottom Diameter (in)	3.002	3.008
Average Length (in)	3.01	3.01
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	349.63	350.29
Unit Wet Weight (g/cm^3)	1.92	1.89
Unit Wet Weight (pcf)	119.6	117.9
Unit Dry Weight (pcf)	92.0	91.8
Unit Dry Weight (g/cm^3)	1.47	1.47
Void Ratio, e	0.83	0.84
Porosity, n	0.45	0.46
Pore Volume (cm^3)	158.8	159.4
Total Weight of Sample After Test (g)		679.79

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-035	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.98

Final Sample Dimensions	
Sample Length (cm), L	7.65
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 8.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	10	3	0.000	0.0	0.0	196.8	0	21.2	NA
1/16/23	11	12	1.150	0.5	0.5	195.7	0	21.2	9.9E-08
1/16/23	12	41	2.633	1.1	1.0	194.6	0	21.2	8.1E-08
1/16/23	13	58	3.917	1.6	1.5	193.6	0	21.1	9.0E-08
1/16/23	15	18	5.250	2.1	2.0	192.6	0	21.1	8.7E-08
1/17/23	6	51	20.800	7.6	7.2	181.5	0	21.2	8.2E-08
1/17/23	8	48	22.750	8.2	7.8	180.2	0	21.2	7.9E-08
1/17/23	10	48	24.750	8.8	8.4	179.0	1	21.2	7.5E-08

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-036	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.018	Top Dia. (in):	2.010
Length 2 (in):	4.017	Mid. Dia. (in):	2.009
Length 3 (in):	4.016	Bot. Dia. (in):	2.002
Avg. Length (in):	4.017	Area (in^2):	3.164

WATER CONTENT (AFTER TEST)

Tare No.:	3278
Weight of Tare & Wet Sample (g):	386.86
Weight of Tare & Dry Sample (g):	292.83
Weight of Tare (g):	8.12
% Moisture:	33.03

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	381.5	Sample Volume (cm^3):	208.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.83
Weight of Wet Sample (g):	381.54	Unit Wet Weight (pcf):	114.32
Avg. Diameter (in):	2.01	Moisture Content (%):	33.03
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	85.94
Avg. Length (cm):	10.20		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1905	**602.16**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-037	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.016	Top Dia. (in):	2.000
Length 2 (in):	4.013	Mid. Dia. (in):	1.998
Length 3 (in):	4.013	Bot. Dia. (in):	1.998
Avg. Length (in):	4.014	Area (in^2):	3.137

WATER CONTENT (AFTER TEST)

Tare No.:	3143
Weight of Tare & Wet Sample (g):	384.82
Weight of Tare & Dry Sample (g):	291.93
Weight of Tare (g):	8.13
% Moisture:	32.73

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	378.9	Sample Volume (cm^3):	206.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.84
Weight of Wet Sample (g):	378.91	Unit Wet Weight (pcf):	114.57
Avg. Diameter (in):	2.00	Moisture Content (%):	32.73
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	86.32
Avg. Length (cm):	10.20		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
2375	**756.99**

Tested By JAC Date 12/30/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-038	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.015	Top Dia. (in):	2.007
Length 2 (in):	4.013	Mid. Dia. (in):	2.004
Length 3 (in):	4.012	Bot. Dia. (in):	2.000
Avg. Length (in):	4.013	Area (in^2):	3.153

WATER CONTENT (AFTER TEST)

Tare No.:	3027
Weight of Tare & Wet Sample (g):	382.42
Weight of Tare & Dry Sample (g):	290.33
Weight of Tare (g):	8.05
% Moisture:	32.62

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	378.6	Sample Volume (cm^3):	207.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.83
Weight of Wet Sample (g):	378.57	Unit Wet Weight (pcf):	113.92
Avg. Diameter (in):	2.00	Moisture Content (%):	32.62
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	85.89
Avg. Length (cm):	10.19		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
2665	**845.19**

Tested By JAC Date 1/13/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

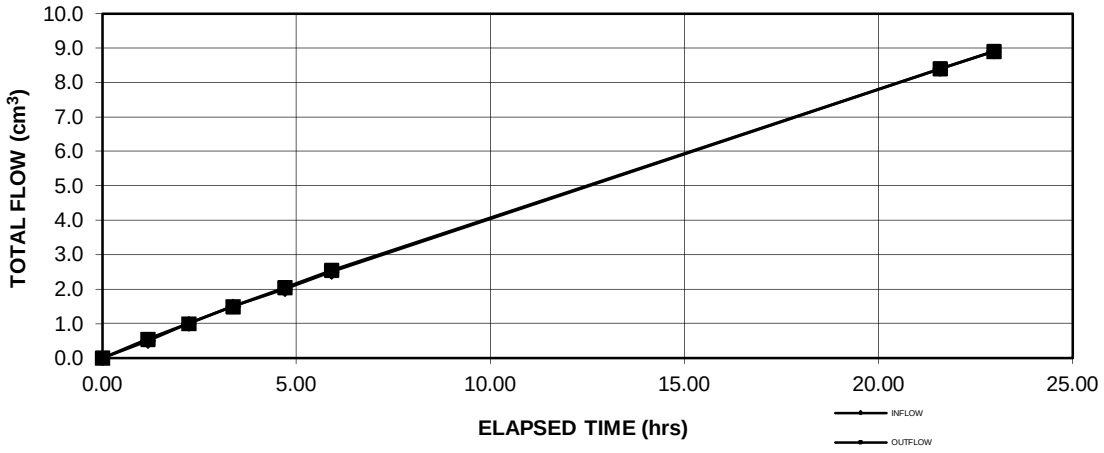
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-039	Avg. Effective Consol. Pressure (psi):	6.25

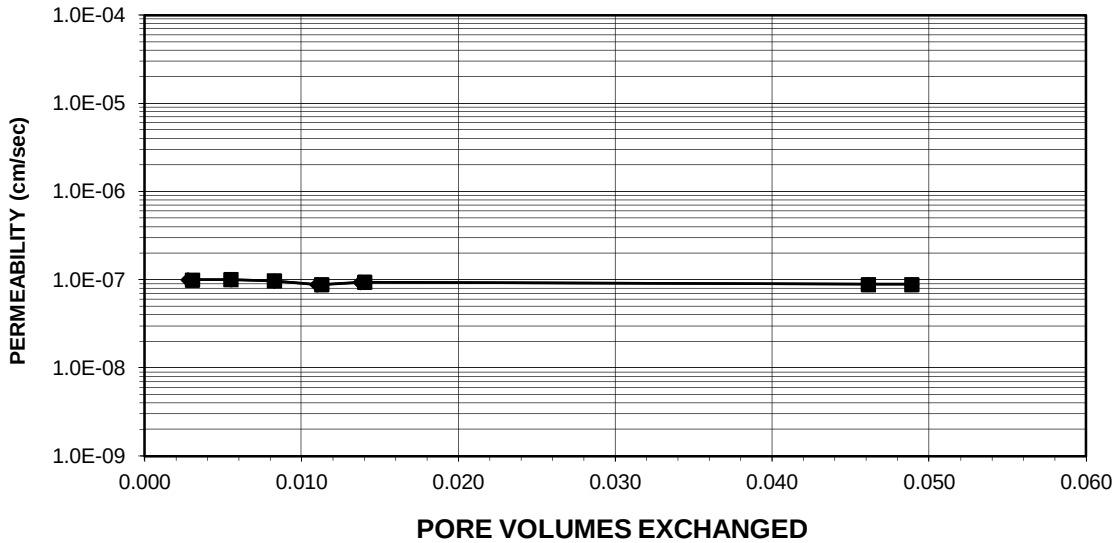
AVERAGE PERMEABILITY = 8.9E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.9E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-039	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish-Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	610	303
Weight of Tare & Wet Sample (g)	226.23	729.96
Weight of Tare & Dry Sample (g)	186.33	559.84
Weight of Tare (g)	82.69	110.27
Weight of Water (g)	39.90	170.12
Weight of Dry Sample (g)	103.64	449.57
Moisture Content (%)	**38.5**	**37.8**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	620.39	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	620.39	617.44
Length 1 (in)	2.996	2.970
Length 2 (in)	2.969	3.006
Length 3 (in)	3.000	3.004
Top Diameter (in)	3.008	3.001
Middle Diameter (in)	3.007	3.007
Bottom Diameter (in)	3.004	3.009
Average Length (in)	2.99	2.99
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	347.61	348.04
Unit Wet Weight (g/cm^3)	1.78	1.77
Unit Wet Weight (pcf)	111.4	110.7
Unit Dry Weight (pcf)	80.4	80.3
Unit Dry Weight (g/cm^3)	1.29	1.29
Void Ratio, e	1.10	1.10
Porosity, n	0.52	0.52
Pore Volume (cm^3)	181.7	182.1
Total Weight of Sample After Test (g)		630.85

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-039	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.12

Final Sample Dimensions	
Sample Length (cm), L	7.60
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.78
Inflow Burette Area (cm^2), a-in	0.961
Outflow Burette Area (cm^2), a-out	0.850
B Parameter (%)	97

AVERAGE PERMEABILITY = 8.9E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.9E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/3/23	9	17	0.000	0.0	0.0	201.3	0	21.3	NA
1/3/23	10	27	1.167	0.5	0.6	200.1	0	21.4	1.0E-07
1/3/23	11	30	2.217	1.0	1.0	199.1	0	21.4	1.0E-07
1/3/23	12	39	3.367	1.5	1.5	198.0	0	21.6	9.7E-08
1/3/23	13	59	4.700	2.0	2.1	196.8	0	21.7	8.8E-08
1/3/23	15	11	5.900	2.5	2.6	195.7	0	21.7	9.3E-08
1/4/23	6	52	21.583	8.4	8.4	182.7	0	21.2	8.8E-08
1/4/23	8	15	22.967	8.9	8.9	181.6	1	21.3	8.8E-08

Tested By: JG Date: 12/30/22 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

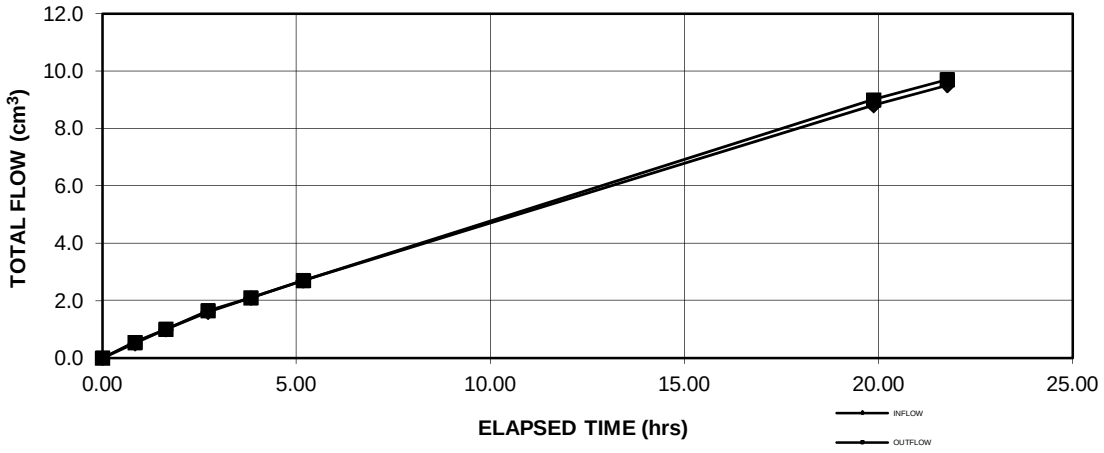
ASTM D 5084-16a Method C

Client:	Geo-Solutions, inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-040	Avg. Effective Consol. Pressure (psi):	6.25

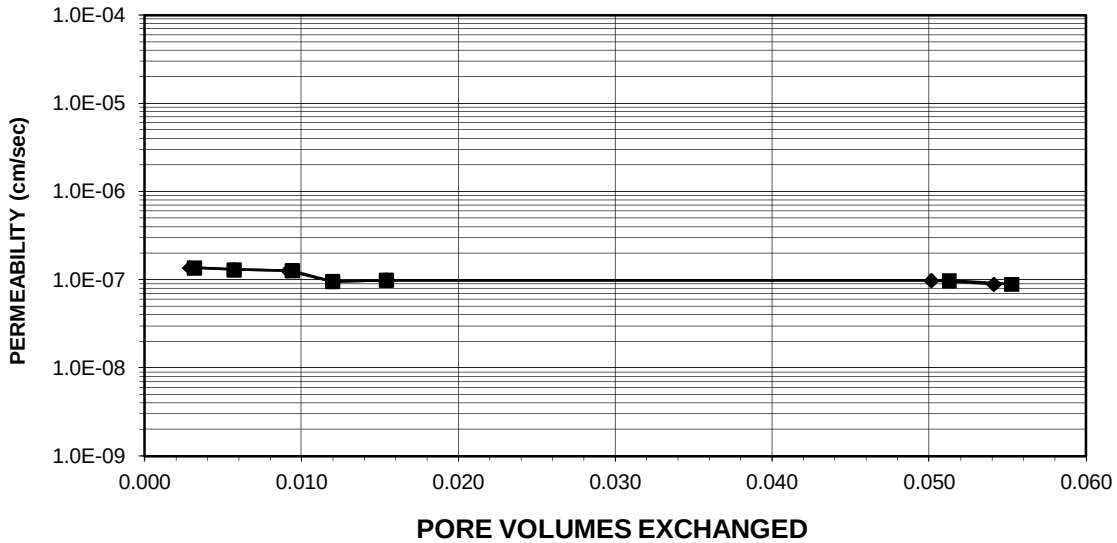
AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/13/23	Checked By:	JLK	Date:	1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-040	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Reddish Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	871	913
Weight of Tare & Wet Sample (g)	258.13	727.50
Weight of Tare & Dry Sample (g)	217.57	566.15
Weight of Tare (g)	110.06	110.36
Weight of Water (g)	40.56	161.35
Weight of Dry Sample (g)	107.51	455.79
Moisture Content (%)	**37.7**	**35.4**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	615.45	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	615.45	605.05
Length 1 (in)	2.895	2.888
Length 2 (in)	2.951	2.948
Length 3 (in)	2.919	2.962
Top Diameter (in)	3.004	3.003
Middle Diameter (in)	3.006	3.005
Bottom Diameter (in)	3.004	3.010
Average Length (in)	2.92	2.93
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	339.48	341.06
Unit Wet Weight (g/cm^3)	1.81	1.77
Unit Wet Weight (pcf)	113.2	110.7
Unit Dry Weight (pcf)	82.2	81.8
Unit Dry Weight (g/cm^3)	1.32	1.31
Void Ratio, e	1.05	1.06
Porosity, n	0.51	0.51
Pore Volume (cm^3)	174.0	175.6
Total Weight of Sample After Test (g)		625.94

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, inc.	Boring No.:	12/16/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-2-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-040	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	77.5
Bottom Cap (psi)	80.0
Cell (psi)	85.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.59

Final Sample Dimensions	
Sample Length (cm), L	7.45
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.79
Inflow Burette Area (cm^2), a-in	0.879
Outflow Burette Area (cm^2), a-out	0.896
B Parameter (%)	97

AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/16/23	11	1	0.000	0.0	0.0	203.3	0	21.2	NA
1/16/23	11	51	0.833	0.5	0.6	202.1	0	21.2	1.4E-07
1/16/23	12	39	1.633	1.0	1.0	201.0	0	21.2	1.3E-07
1/16/23	13	44	2.717	1.6	1.7	199.6	0	21.1	1.3E-07
1/16/23	14	50	3.817	2.1	2.1	198.5	0	21.1	9.6E-08
1/16/23	16	11	5.167	2.7	2.7	197.2	0	21.1	9.9E-08
1/17/23	6	53	19.867	8.8	9.0	183.2	0	21.2	9.8E-08
1/17/23	8	47	21.767	9.5	9.7	181.6	1	21.2	8.9E-08

Tested By: JG Date: 1/13/23 Checked By: JLK Date: 1/18/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-041	Visual Description:	Reddish Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.998	Top Dia. (in):	2.007
Length 2 (in):	3.997	Mid. Dia. (in):	2.001
Length 3 (in):	3.996	Bot. Dia. (in):	1.995
Avg. Length (in):	3.997	Area (in^2):	3.145

WATER CONTENT (AFTER TEST)

Tare No.:	3223
Weight of Tare & Wet Sample (g):	394.90
Weight of Tare & Dry Sample (g):	312.56
Weight of Tare (g):	8.18
% Moisture:	27.05

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	389.3	Sample Volume (cm^3):	206.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	389.3	Unit Wet Weight (pcf):	117.94
Avg. Diameter (in):	2.00	Moisture Content (%):	27.05
Avg. Length (in):	4.00	Unit Dry Weight (pcf):	92.83
Avg. Length (cm):	10.15		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
180	**57.24**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-042	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.967	Top Dia. (in):	2.005
Length 2 (in):	3.966	Mid. Dia. (in):	2.002
Length 3 (in):	3.966	Bot. Dia. (in):	2.000
Avg. Length (in):	3.966	Area (in^2):	3.149

WATER CONTENT (AFTER TEST)

Tare No.:	3272
Weight of Tare & Wet Sample (g):	395.90
Weight of Tare & Dry Sample (g):	313.40
Weight of Tare (g):	8.11
% Moisture:	27.02

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	389.0	Sample Volume (cm^3):	204.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.90
Weight of Wet Sample (g):	388.96	Unit Wet Weight (pcf):	118.59
Avg. Diameter (in):	2.00	Moisture Content (%):	27.02
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	93.36
Avg. Length (cm):	10.07		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
300	**95.27**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-043	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.976	Top Dia. (in):	2.005
Length 2 (in):	3.974	Mid. Dia. (in):	2.003
Length 3 (in):	3.973	Bot. Dia. (in):	2.000
Avg. Length (in):	3.974	Area (in^2):	3.150

WATER CONTENT (AFTER TEST)

Tare No.:	2800
Weight of Tare & Wet Sample (g):	395.81
Weight of Tare & Dry Sample (g):	313.47
Weight of Tare (g):	8.19
% Moisture:	26.97

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	388.6	Sample Volume (cm^3):	205.2
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	388.59	Unit Wet Weight (pcf):	118.20
Avg. Diameter (in):	2.00	Moisture Content (%):	26.97
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	93.09
Avg. Length (cm):	10.09		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
575	**182.54**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

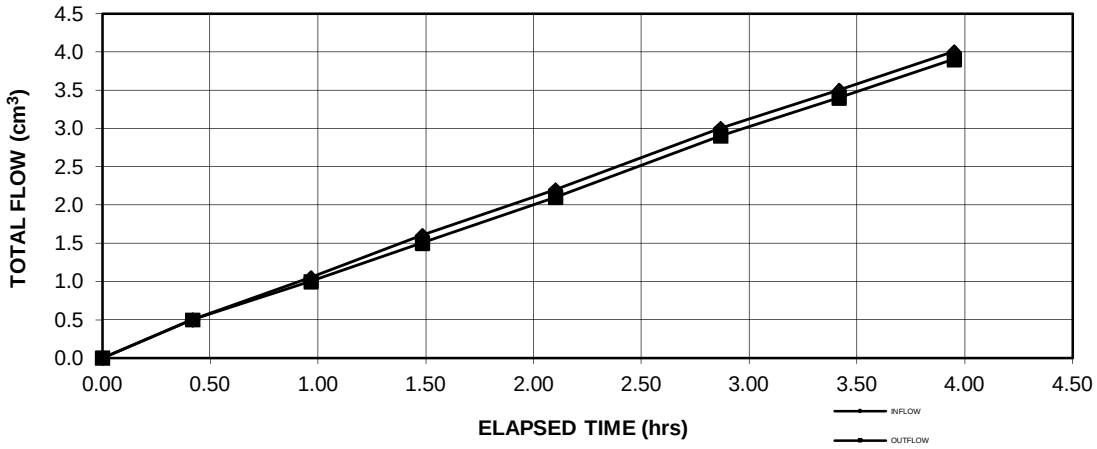
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-044	Avg. Effective Consol. Pressure (psi):	6.25

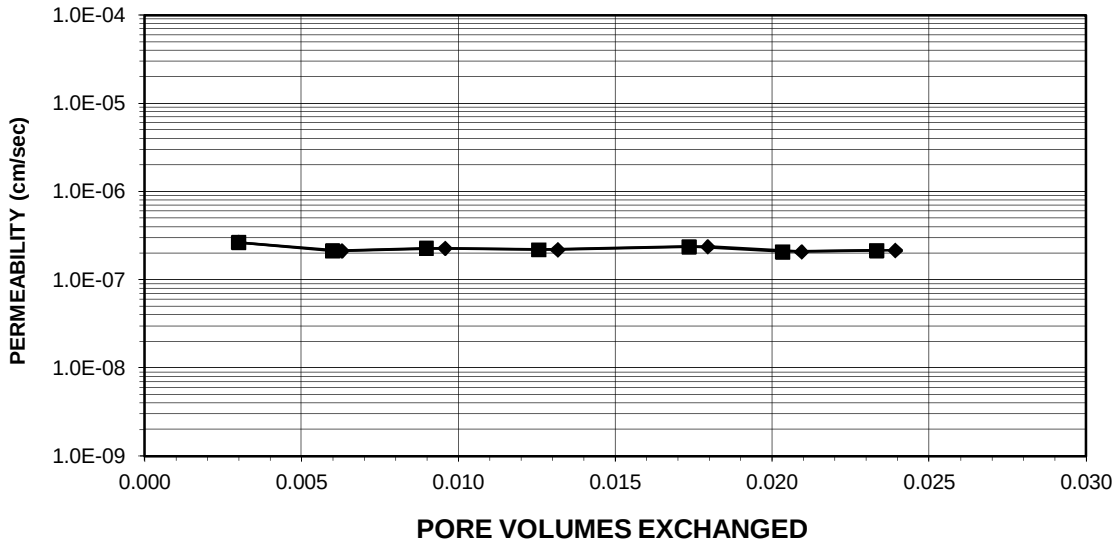
AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/5/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-044	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	560	1706
Weight of Tare & Wet Sample (g)	280.46	750.48
Weight of Tare & Dry Sample (g)	232.70	595.83
Weight of Tare (g)	82.08	82.43
Weight of Water (g)	47.76	154.65
Weight of Dry Sample (g)	150.62	513.40
Moisture Content (%)	**31.7**	**30.1**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	666.89	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	666.89	658.86
Length 1 (in)	3.068	3.081
Length 2 (in)	3.019	3.058
Length 3 (in)	3.088	3.005
Top Diameter (in)	3.005	3.011
Middle Diameter (in)	3.006	3.006
Bottom Diameter (in)	3.001	3.005
Average Length (in)	3.06	3.05
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	355.20	354.79
Unit Wet Weight (g/cm^3)	1.88	1.86
Unit Wet Weight (pcf)	117.2	115.9
Unit Dry Weight (pcf)	89.0	89.1
Unit Dry Weight (g/cm^3)	1.43	1.43
Void Ratio, e	0.89	0.89
Porosity, n	0.47	0.47
Pore Volume (cm^3)	167.7	167.3
Total Weight of Sample After Test (g)		674.56

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-044	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.70

Final Sample Dimensions	
Sample Length (cm), L	7.74
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.83
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	9	41	0.000	0.0	0.0	196.8	0	23.0	NA
1/4/23	10	6	0.417	0.5	0.5	195.7	0	23.0	2.7E-07
1/4/23	10	39	0.967	1.1	1.0	194.6	0	23.0	2.1E-07
1/4/23	11	10	1.483	1.6	1.5	193.6	0	23.0	2.3E-07
1/4/23	11	47	2.100	2.2	2.1	192.3	0	23.0	2.2E-07
1/4/23	12	33	2.867	3.0	2.9	190.7	0	23.0	2.4E-07
1/4/23	13	6	3.417	3.5	3.4	189.6	0	23.0	2.1E-07
1/4/23	13	38	3.950	4.0	3.9	188.6	1	23.0	2.2E-07

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

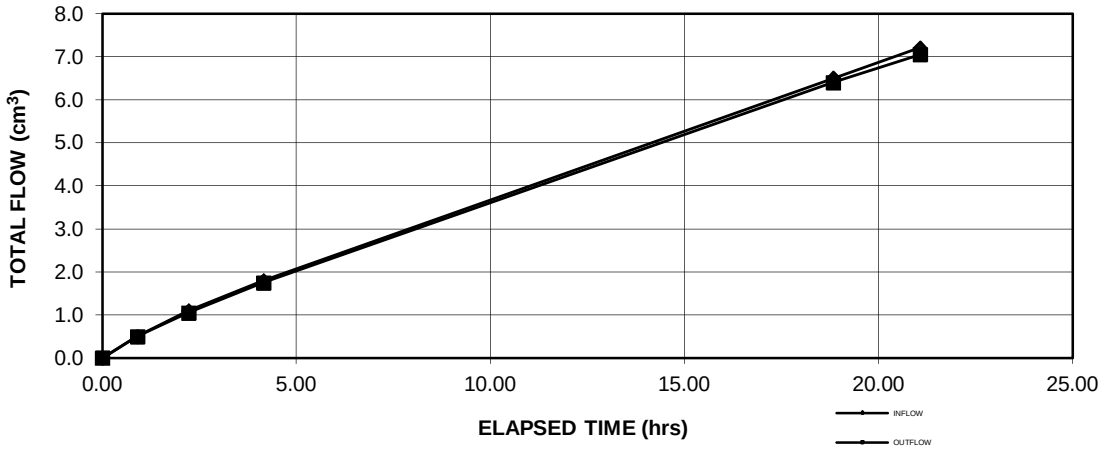
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-045	Avg. Effective Consol. Pressure (psi):	6.25

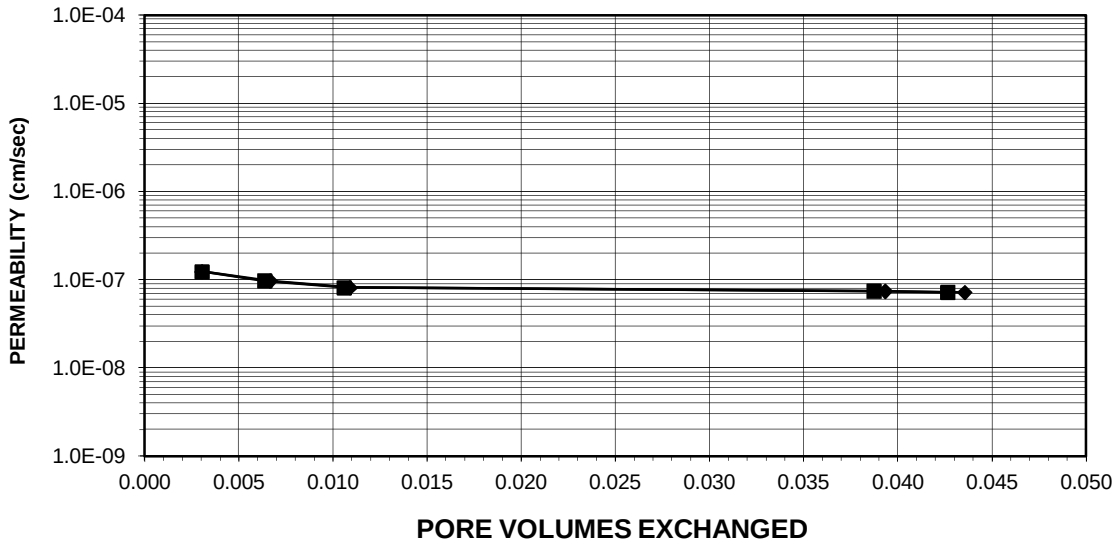
AVERAGE PERMEABILITY = 8.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-045	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	595	550
Weight of Tare & Wet Sample (g)	305.38	737.09
Weight of Tare & Dry Sample (g)	253.26	585.95
Weight of Tare (g)	86.57	81.24
Weight of Water (g)	52.12	151.14
Weight of Dry Sample (g)	166.69	504.71
Moisture Content (%)	**31.3**	**29.9**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	662.47	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	662.47	655.80
Length 1 (in)	2.988	2.988
Length 2 (in)	3.066	3.061
Length 3 (in)	3.024	3.031
Top Diameter (in)	3.010	3.005
Middle Diameter (in)	3.005	3.007
Bottom Diameter (in)	3.007	3.009
Average Length (in)	3.03	3.03
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	352.23	352.23
Unit Wet Weight (g/cm^3)	1.88	1.86
Unit Wet Weight (pcf)	117.4	116.2
Unit Dry Weight (pcf)	89.4	89.4
Unit Dry Weight (g/cm^3)	1.43	1.43
Void Ratio, e	0.88	0.88
Porosity, n	0.47	0.47
Pore Volume (cm^3)	165.3	165.3
Total Weight of Sample After Test (g)		672.21

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-045	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.86

Final Sample Dimensions	
Sample Length (cm), L	7.69
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.82
Inflow Burette Area (cm^2), a-in	1.002
Outflow Burette Area (cm^2), a-out	0.915
B Parameter (%)	96

AVERAGE PERMEABILITY = 8.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 8.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	12	16	0.000	0.0	0.0	206.3	0	21.5	NA
1/18/23	13	10	0.900	0.5	0.5	205.2	0	21.5	1.2E-07
1/18/23	14	29	2.217	1.1	1.1	204.0	0	21.5	9.7E-08
1/18/23	16	25	4.150	1.8	1.8	202.5	0	21.5	8.1E-08
1/19/23	7	6	18.833	6.5	6.4	192.6	0	21.2	7.4E-08
1/19/23	9	20	21.067	7.2	7.1	191.1	1	21.4	7.2E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-046	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.978	Top Dia. (in):	2.003
Length 2 (in):	3.978	Mid. Dia. (in):	2.001
Length 3 (in):	3.977	Bot. Dia. (in):	2.000
Avg. Length (in):	3.978	Area (in^2):	3.146

WATER CONTENT (AFTER TEST)

Tare No.:	2976
Weight of Tare & Wet Sample (g):	396.77
Weight of Tare & Dry Sample (g):	311.99
Weight of Tare (g):	8.06
% Moisture:	27.89

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	391.0	Sample Volume (cm^3):	205.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.91
Weight of Wet Sample (g):	390.95	Unit Wet Weight (pcf):	118.97
Avg. Diameter (in):	2.00	Moisture Content (%):	27.89
Avg. Length (in):	3.98	Unit Dry Weight (pcf):	93.02
Avg. Length (cm):	10.10		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
195	**61.99**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-047	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.987	Top Dia. (in):	2.005
Length 2 (in):	3.986	Mid. Dia. (in):	2.003
Length 3 (in):	3.985	Bot. Dia. (in):	2.000
Avg. Length (in):	3.986	Area (in^2):	3.150

WATER CONTENT (AFTER TEST)

Tare No.:	2892
Weight of Tare & Wet Sample (g):	396.06
Weight of Tare & Dry Sample (g):	310.97
Weight of Tare (g):	8.14
% Moisture:	28.10

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	388.6	Sample Volume (cm^3):	205.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	388.56	Unit Wet Weight (pcf):	117.84
Avg. Diameter (in):	2.00	Moisture Content (%):	28.10
Avg. Length (in):	3.99	Unit Dry Weight (pcf):	91.99
Avg. Length (cm):	10.12		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
430	**136.51**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-048	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.902	Top Dia. (in):	2.008
Length 2 (in):	3.901	Mid. Dia. (in):	2.006
Length 3 (in):	3.901	Bot. Dia. (in):	2.002
Avg. Length (in):	3.901	Area (in^2):	3.158

WATER CONTENT (AFTER TEST)

Tare No.:	3267
Weight of Tare & Wet Sample (g):	389.03
Weight of Tare & Dry Sample (g):	305.96
Weight of Tare (g):	8.20
% Moisture:	27.90

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	381.9	Sample Volume (cm^3):	201.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	381.89	Unit Wet Weight (pcf):	118.02
Avg. Diameter (in):	2.01	Moisture Content (%):	27.90
Avg. Length (in):	3.90	Unit Dry Weight (pcf):	92.27
Avg. Length (cm):	9.91		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
710	**224.80**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

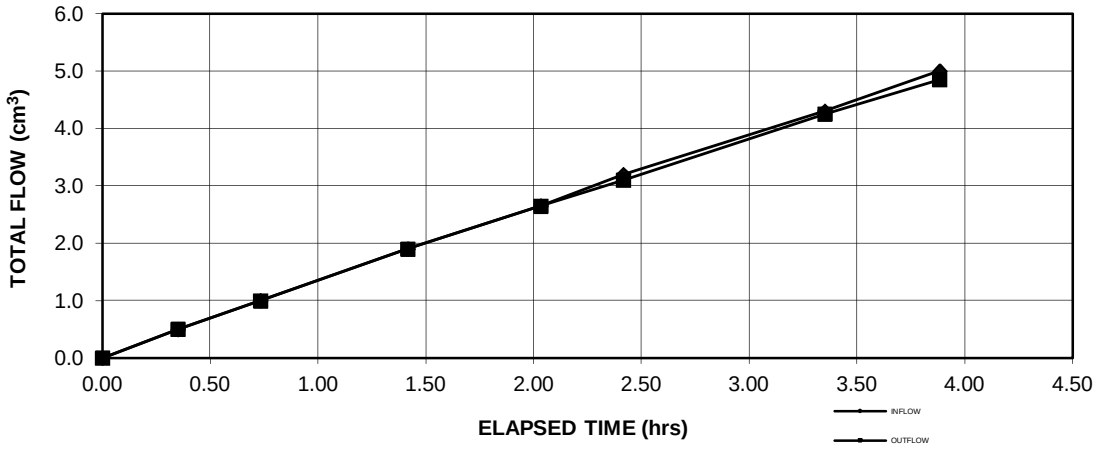
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-049	Avg. Effective Consol. Pressure (psi):	6.25

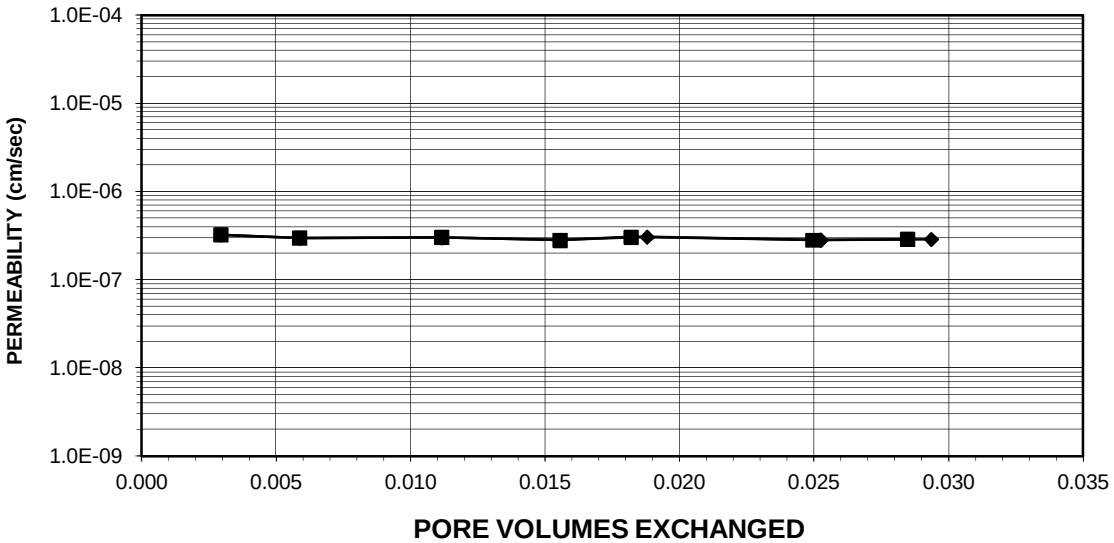
AVERAGE PERMEABILITY = 2.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.9E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-049	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	907	1741
Weight of Tare & Wet Sample (g)	293.39	753.79
Weight of Tare & Dry Sample (g)	249.36	594.00
Weight of Tare (g)	110.14	82.65
Weight of Water (g)	44.03	159.79
Weight of Dry Sample (g)	139.22	511.35
Moisture Content (%)	**31.6**	**31.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	677.76	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	677.76	675.82
Length 1 (in)	3.092	3.118
Length 2 (in)	3.155	3.058
Length 3 (in)	3.138	3.134
Top Diameter (in)	3.012	3.003
Middle Diameter (in)	3.009	3.006
Bottom Diameter (in)	3.004	3.011
Average Length (in)	3.13	3.10
Average Area (in^2)	7.11	7.10
Sample Volume (cm^3)	364.38	361.08
Unit Wet Weight (g/cm^3)	1.86	1.87
Unit Wet Weight (pcf)	116.1	116.8
Unit Dry Weight (pcf)	88.2	89.0
Unit Dry Weight (g/cm^3)	1.41	1.43
Void Ratio, e	0.91	0.89
Porosity, n	0.48	0.47
Pore Volume (cm^3)	173.7	170.4
Total Weight of Sample After Test (g)		685.52

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/5/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-049	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.30

Final Sample Dimensions	
Sample Length (cm), L	7.88
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.911
Outflow Burette Area (cm^2), a-out	0.968
B Parameter (%)	96

AVERAGE PERMEABILITY = 2.9E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.9E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	9	44	0.000	0.0	0.0	202.6	0	21.3	NA
1/4/23	10	5	0.350	0.5	0.5	201.5	0	21.4	3.2E-07
1/4/23	10	28	0.733	1.0	1.0	200.4	0	21.4	3.0E-07
1/4/23	11	9	1.417	1.9	1.9	198.6	0	21.5	3.0E-07
1/4/23	11	46	2.033	2.7	2.7	197.0	0	21.5	2.8E-07
1/4/23	12	9	2.417	3.2	3.1	195.9	0	21.5	3.0E-07
1/4/23	13	5	3.350	4.3	4.3	193.5	0	21.6	2.8E-07
1/4/23	13	37	3.883	5.0	4.9	192.2	1	21.7	2.9E-07

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/5/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

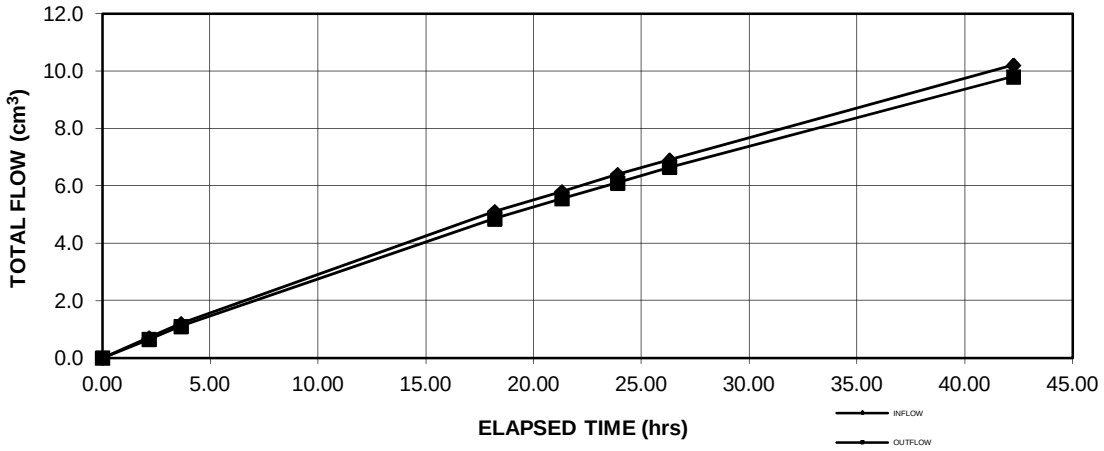
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-050	Avg. Effective Consol. Pressure (psi):	6.25

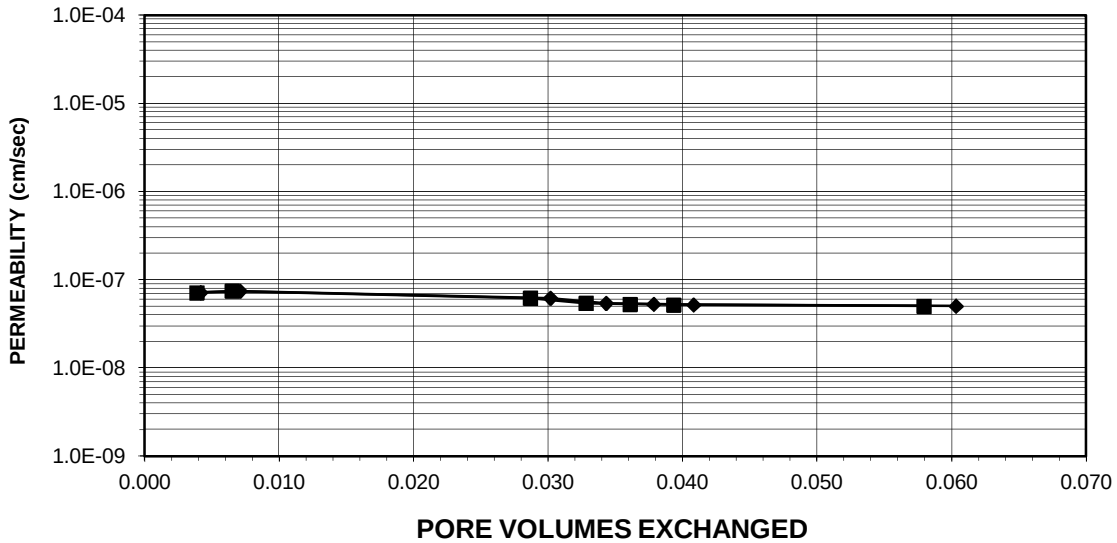
AVERAGE PERMEABILITY = 5.2E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.2E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-050	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	566	905
Weight of Tare & Wet Sample (g)	301.10	773.35
Weight of Tare & Dry Sample (g)	247.74	613.73
Weight of Tare (g)	84.33	109.63
Weight of Water (g)	53.36	159.62
Weight of Dry Sample (g)	163.41	504.10
Moisture Content (%)	**32.7**	**31.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	662.10	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	662.10	657.16
Length 1 (in)	3.021	3.078
Length 2 (in)	3.081	3.031
Length 3 (in)	3.024	3.014
Top Diameter (in)	3.007	3.004
Middle Diameter (in)	3.006	3.006
Bottom Diameter (in)	3.007	3.012
Average Length (in)	3.04	3.04
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	353.93	353.97
Unit Wet Weight (g/cm^3)	1.87	1.86
Unit Wet Weight (pcf)	116.8	115.9
Unit Dry Weight (pcf)	88.0	88.0
Unit Dry Weight (g/cm^3)	1.41	1.41
Void Ratio, e	0.91	0.91
Porosity, n	0.48	0.48
Pore Volume (cm^3)	169.1	169.1
Total Weight of Sample After Test (g)		671.08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-050	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.75

Final Sample Dimensions	
Sample Length (cm), L	7.72
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.83
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	95

AVERAGE PERMEABILITY = 5.2E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.2E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	12	48	0.000	0.0	0.0	196.8	0	22.1	NA
1/18/23	14	57	2.150	0.7	0.6	195.4	0	21.8	7.1E-08
1/18/23	16	26	3.633	1.2	1.1	194.4	0	21.1	7.5E-08
1/19/23	6	59	18.183	5.1	4.9	186.5	0	21.7	6.2E-08
1/19/23	10	6	21.300	5.8	5.6	185.0	0	21.7	5.4E-08
1/19/23	12	41	23.883	6.4	6.1	183.8	0	22.7	5.3E-08
1/19/23	15	6	26.300	6.9	6.7	182.8	0	22.7	5.2E-08
1/20/23	7	3	42.250	10.2	9.8	176.1	1	21.8	5.0E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-051	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.000	Top Dia. (in):	2.003
Length 2 (in):	3.998	Mid. Dia. (in):	2.002
Length 3 (in):	3.997	Bot. Dia. (in):	2.000
Avg. Length (in):	3.998	Area (in^2):	3.147

WATER CONTENT (AFTER TEST)

Tare No.:	3181
Weight of Tare & Wet Sample (g):	395.54
Weight of Tare & Dry Sample (g):	311.75
Weight of Tare (g):	8.22
% Moisture:	27.61

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	389.9	Sample Volume (cm^3):	206.2
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	389.94	Unit Wet Weight (pcf):	118.01
Avg. Diameter (in):	2.00	Moisture Content (%):	27.61
Avg. Length (in):	4.00	Unit Dry Weight (pcf):	92.48
Avg. Length (cm):	10.16		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
720	**228.80**

Tested By JAC Date 12/23/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-052	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.990	Top Dia. (in):	2.005
Length 2 (in):	3.989	Mid. Dia. (in):	2.004
Length 3 (in):	3.989	Bot. Dia. (in):	2.002
Avg. Length (in):	3.989	Area (in^2):	3.153

WATER CONTENT (AFTER TEST)

Tare No.:	3264
Weight of Tare & Wet Sample (g):	398.15
Weight of Tare & Dry Sample (g):	315.35
Weight of Tare (g):	8.13
% Moisture:	26.95

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	390.7	Sample Volume (cm^3):	206.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.90
Weight of Wet Sample (g):	390.67	Unit Wet Weight (pcf):	118.26
Avg. Diameter (in):	2.00	Moisture Content (%):	26.95
Avg. Length (in):	3.99	Unit Dry Weight (pcf):	93.16
Avg. Length (cm):	10.13		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
945	**299.70**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-053	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.983	Top Dia. (in):	2.007
Length 2 (in):	3.981	Mid. Dia. (in):	2.004
Length 3 (in):	3.979	Bot. Dia. (in):	2.000
Avg. Length (in):	3.981	Area (in^2):	3.153

WATER CONTENT (AFTER TEST)

Tare No.:	3114
Weight of Tare & Wet Sample (g):	395.46
Weight of Tare & Dry Sample (g):	313.67
Weight of Tare (g):	8.13
% Moisture:	26.77

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	388.3	Sample Volume (cm^3):	205.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.89
Weight of Wet Sample (g):	388.34	Unit Wet Weight (pcf):	117.80
Avg. Diameter (in):	2.00	Moisture Content (%):	26.77
Avg. Length (in):	3.98	Unit Dry Weight (pcf):	92.93
Avg. Length (cm):	10.11		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
930	**294.95**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

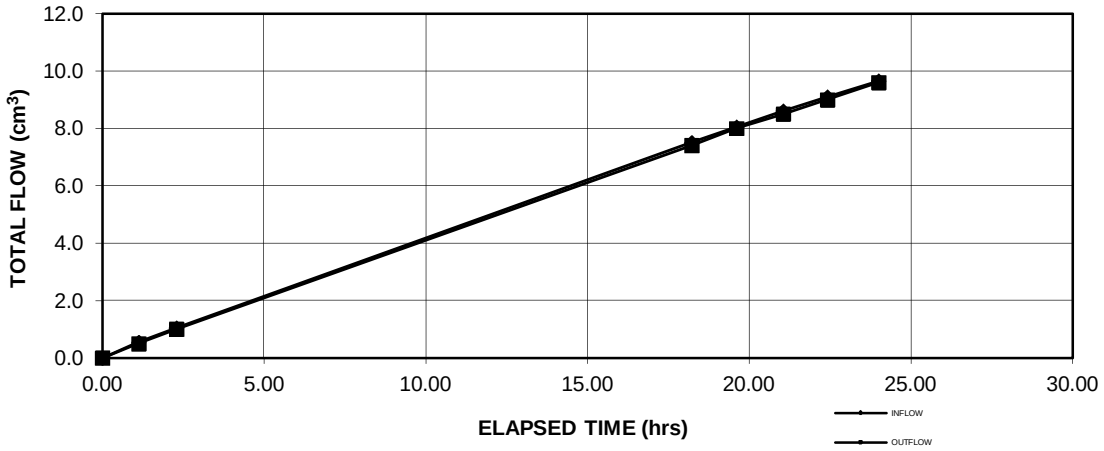
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-054	Avg. Effective Consol. Pressure (psi):	6.25

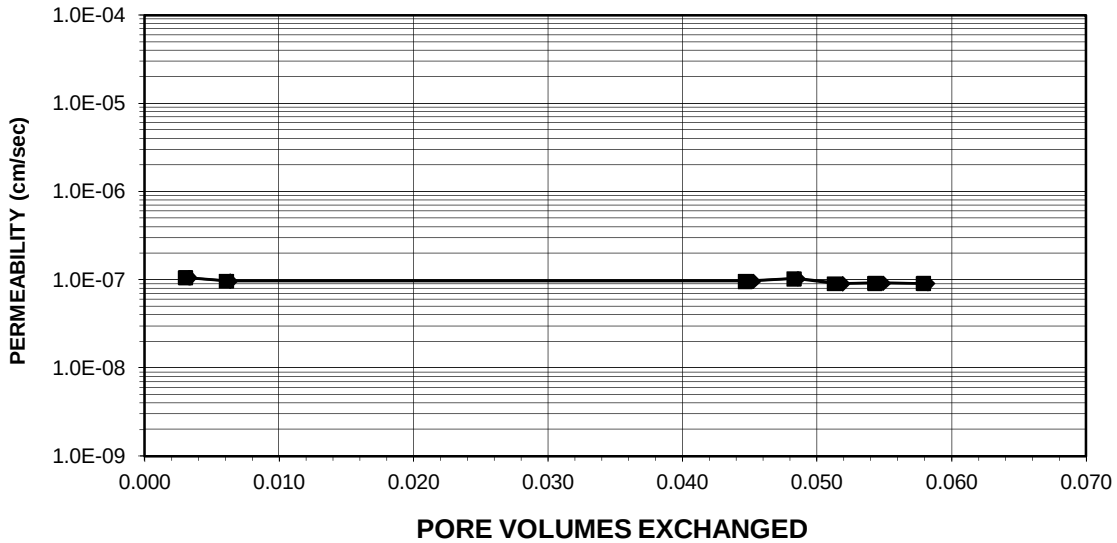
AVERAGE PERMEABILITY = 9.4E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.4E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/6/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-054	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	565	1705
Weight of Tare & Wet Sample (g)	299.54	758.62
Weight of Tare & Dry Sample (g)	249.75	601.97
Weight of Tare (g)	82.01	82.77
Weight of Water (g)	49.79	156.65
Weight of Dry Sample (g)	167.74	519.20
Moisture Content (%)	**29.7**	**30.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	672.21	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	672.21	674.74
Length 1 (in)	3.042	3.060
Length 2 (in)	3.104	3.101
Length 3 (in)	3.067	3.060
Top Diameter (in)	3.005	3.005
Middle Diameter (in)	3.007	3.010
Bottom Diameter (in)	3.000	3.007
Average Length (in)	3.07	3.07
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	356.67	357.78
Unit Wet Weight (g/cm^3)	1.88	1.89
Unit Wet Weight (pcf)	117.6	117.7
Unit Dry Weight (pcf)	90.7	90.4
Unit Dry Weight (g/cm^3)	1.45	1.45
Void Ratio, e	0.86	0.86
Porosity, n	0.46	0.46
Pore Volume (cm^3)	164.7	165.8
Total Weight of Sample After Test (g)		683.21

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/6/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-054	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	87.5
Bottom Cap (psi)	90.0
Cell (psi)	95.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.51

Final Sample Dimensions	
Sample Length (cm), L	7.81
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.83
Inflow Burette Area (cm^2), a-in	0.875
Outflow Burette Area (cm^2), a-out	0.974
B Parameter (%)	100

AVERAGE PERMEABILITY = 9.4E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.4E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	13	35	0.000	0.0	0.0	202.1	0	21.7	NA
1/4/23	14	42	1.117	0.6	0.5	200.9	0	21.8	1.1E-07
1/4/23	15	52	2.283	1.1	1.0	199.8	0	21.9	9.7E-08
1/5/23	7	48	18.217	7.5	7.4	185.9	0	21.2	9.6E-08
1/5/23	9	11	19.600	8.1	8.0	184.7	0	21.2	1.0E-07
1/5/23	10	38	21.050	8.6	8.5	183.5	0	21.3	9.0E-08
1/5/23	12	0	22.417	9.1	9.0	182.4	0	21.4	9.1E-08
1/5/23	13	35	24.000	9.7	9.6	181.2	1	21.5	9.1E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/6/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

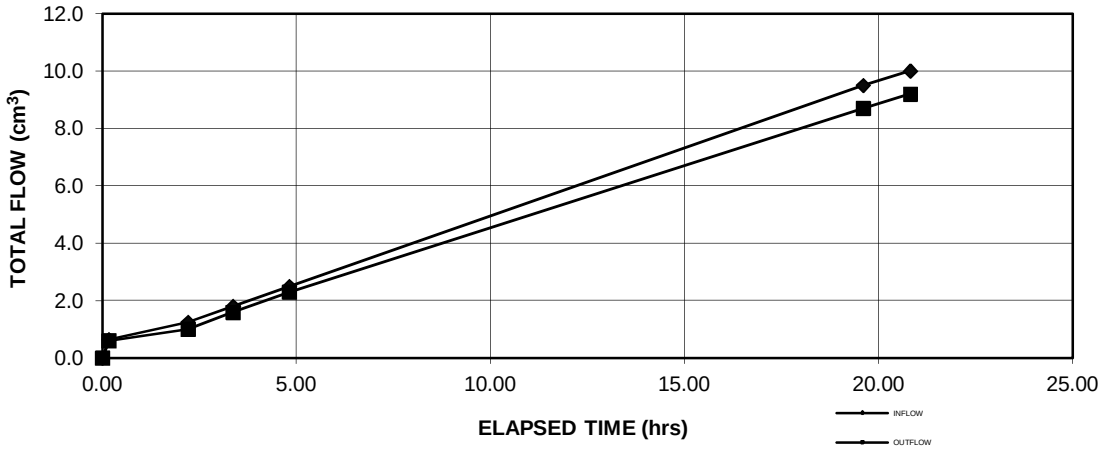
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-055	Avg. Effective Consol. Pressure (psi):	6.25

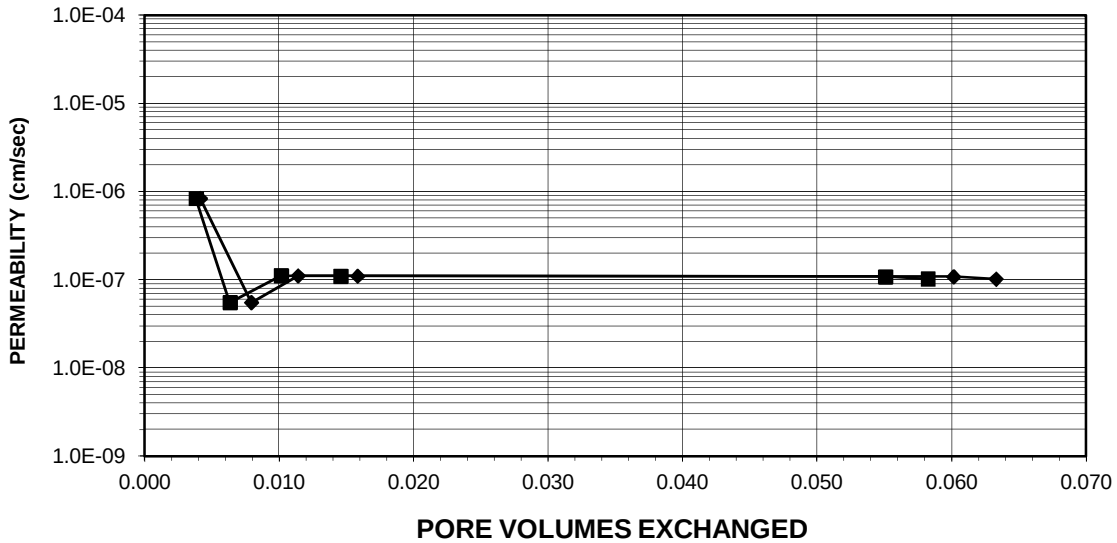
AVERAGE PERMEABILITY = 1.1E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.1E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/17/23	Checked By:	JLK	Date:	1/20/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-055	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	586	606
Weight of Tare & Wet Sample (g)	237.56	739.33
Weight of Tare & Dry Sample (g)	202.42	590.92
Weight of Tare (g)	81.64	85.00
Weight of Water (g)	35.14	148.41
Weight of Dry Sample (g)	120.78	505.92
Moisture Content (%)	**29.1**	**29.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	650.21	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	650.21	651.42
Length 1 (in)	2.984	2.938
Length 2 (in)	2.959	2.954
Length 3 (in)	2.989	2.991
Top Diameter (in)	3.006	3.007
Middle Diameter (in)	3.009	3.005
Bottom Diameter (in)	3.002	3.008
Average Length (in)	2.98	2.96
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	346.18	344.51
Unit Wet Weight (g/cm^3)	1.88	1.89
Unit Wet Weight (pcf)	117.2	118.0
Unit Dry Weight (pcf)	90.8	91.3
Unit Dry Weight (g/cm^3)	1.45	1.46
Void Ratio, e	0.86	0.85
Porosity, n	0.46	0.46
Pore Volume (cm^3)	159.6	158.0
Total Weight of Sample After Test (g)		660.31

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-5
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-055	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.37

Final Sample Dimensions	
Sample Length (cm), L	7.52
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	96

AVERAGE PERMEABILITY = 1.1E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.1E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	11	34	0.000	0.0	0.0	196.8	0	21.5	NA
1/18/23	11	44	0.167	0.7	0.6	195.5	0	21.6	8.3E-07
1/18/23	13	46	2.200	1.3	1.0	194.4	0	21.5	5.5E-08
1/18/23	14	56	3.367	1.8	1.6	193.2	0	21.5	1.1E-07
1/18/23	16	23	4.817	2.5	2.3	191.8	0	21.5	1.1E-07
1/19/23	7	10	19.600	9.5	8.7	177.9	0	21.2	1.1E-07
1/19/23	8	23	20.817	10.0	9.2	176.9	1	21.3	1.0E-07

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-056	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.873	Top Dia. (in):	2.010
Length 2 (in):	3.872	Mid. Dia. (in):	2.007
Length 3 (in):	3.871	Bot. Dia. (in):	2.004
Avg. Length (in):	3.872	Area (in^2):	3.164

WATER CONTENT (AFTER TEST)

Tare No.:	3143
Weight of Tare & Wet Sample (g):	378.00
Weight of Tare & Dry Sample (g):	287.98
Weight of Tare (g):	8.20
% Moisture:	32.18

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	372.2	Sample Volume (cm^3):	200.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.85
Weight of Wet Sample (g):	372.2	Unit Wet Weight (pcf):	115.70
Avg. Diameter (in):	2.01	Moisture Content (%):	32.18
Avg. Length (in):	3.87	Unit Dry Weight (pcf):	87.54
Avg. Length (cm):	9.83		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1015	**320.83**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-057	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.903	Top Dia. (in):	2.007
Length 2 (in):	3.903	Mid. Dia. (in):	2.005
Length 3 (in):	3.903	Bot. Dia. (in):	2.003
Avg. Length (in):	3.903	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3184
Weight of Tare & Wet Sample (g):	379.53
Weight of Tare & Dry Sample (g):	287.96
Weight of Tare (g):	8.04
% Moisture:	32.71

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	372.2	Sample Volume (cm^3):	201.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.84
Weight of Wet Sample (g):	372.24	Unit Wet Weight (pcf):	115.02
Avg. Diameter (in):	2.01	Moisture Content (%):	32.71
Avg. Length (in):	3.90	Unit Dry Weight (pcf):	86.67
Avg. Length (cm):	9.91		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1205	**381.65**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-058	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.911	Top Dia. (in):	2.008
Length 2 (in):	3.910	Mid. Dia. (in):	2.005
Length 3 (in):	3.910	Bot. Dia. (in):	2.002
Avg. Length (in):	3.910	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3090
Weight of Tare & Wet Sample (g):	379.14
Weight of Tare & Dry Sample (g):	290.71
Weight of Tare (g):	8.18
% Moisture:	31.30

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	372.1	Sample Volume (cm^3):	202.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.84
Weight of Wet Sample (g):	372.09	Unit Wet Weight (pcf):	114.76
Avg. Diameter (in):	2.01	Moisture Content (%):	31.30
Avg. Length (in):	3.91	Unit Dry Weight (pcf):	87.41
Avg. Length (cm):	9.93		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1250	**395.91**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

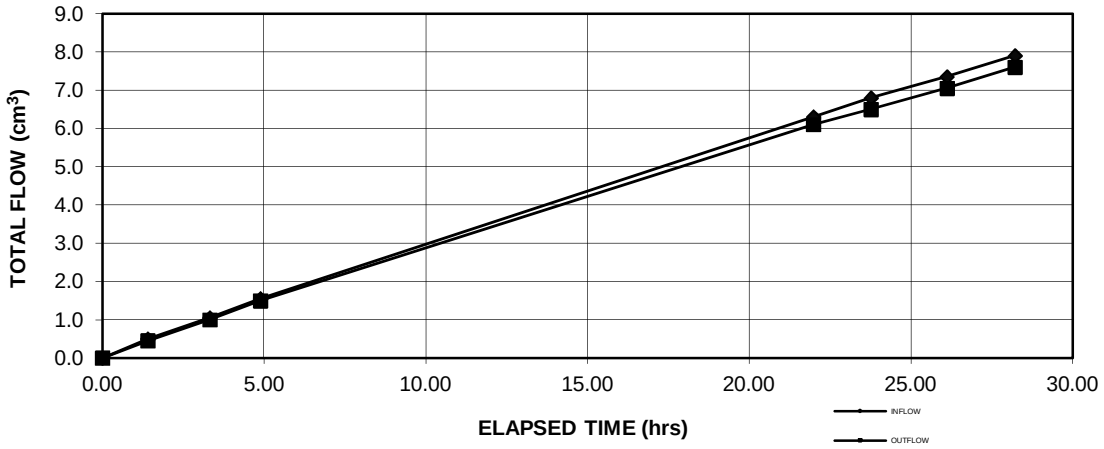
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-059	Avg. Effective Consol. Pressure (psi):	6.25

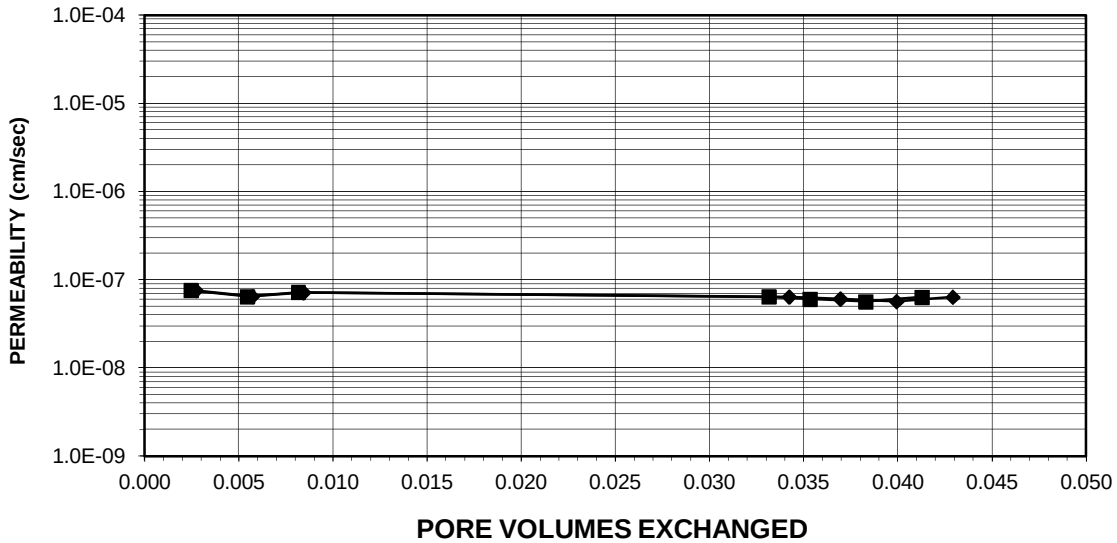
AVERAGE PERMEABILITY = 6.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/6/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-059	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	623	1723
Weight of Tare & Wet Sample (g)	247.76	711.96
Weight of Tare & Dry Sample (g)	199.79	547.14
Weight of Tare (g)	82.97	82.63
Weight of Water (g)	47.97	164.82
Weight of Dry Sample (g)	116.82	464.51
Moisture Content (%)	**41.1**	**35.5**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	647.72	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	647.72	622.10
Length 1 (in)	3.018	3.038
Length 2 (in)	3.068	3.032
Length 3 (in)	3.040	3.045
Top Diameter (in)	3.012	3.012
Middle Diameter (in)	3.010	3.008
Bottom Diameter (in)	3.005	3.008
Average Length (in)	3.04	3.04
Average Area (in^2)	7.11	7.11
Sample Volume (cm^3)	354.48	354.13
Unit Wet Weight (g/cm^3)	1.83	1.76
Unit Wet Weight (pcf)	114.1	109.7
Unit Dry Weight (pcf)	80.9	80.9
Unit Dry Weight (g/cm^3)	1.30	1.30
Void Ratio, e	1.08	1.08
Porosity, n	0.52	0.52
Pore Volume (cm^3)	184.4	184.1
Total Weight of Sample After Test (g)		653.09

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/6/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-059	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.77

Final Sample Dimensions	
Sample Length (cm), L	7.72
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.89
Inflow Burette Area (cm^2), a-in	0.961
Outflow Burette Area (cm^2), a-out	0.850
B Parameter (%)	98

AVERAGE PERMEABILITY = 6.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 6.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	9	47	0.000	0.0	0.0	201.3	0	21.3	NA
1/4/23	11	11	1.400	0.5	0.4	200.2	0	21.5	7.5E-08
1/4/23	13	6	3.317	1.1	1.0	199.0	0	21.6	6.4E-08
1/4/23	14	40	4.883	1.6	1.5	197.9	0	21.8	7.2E-08
1/5/23	7	46	21.983	6.3	6.1	187.6	0	21.2	6.4E-08
1/5/23	9	33	23.767	6.8	6.5	186.6	0	21.2	6.0E-08
1/5/23	11	54	26.117	7.4	7.1	185.4	0	21.4	5.6E-08
1/5/23	14	0	28.217	7.9	7.6	184.2	1	21.5	6.3E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/6/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

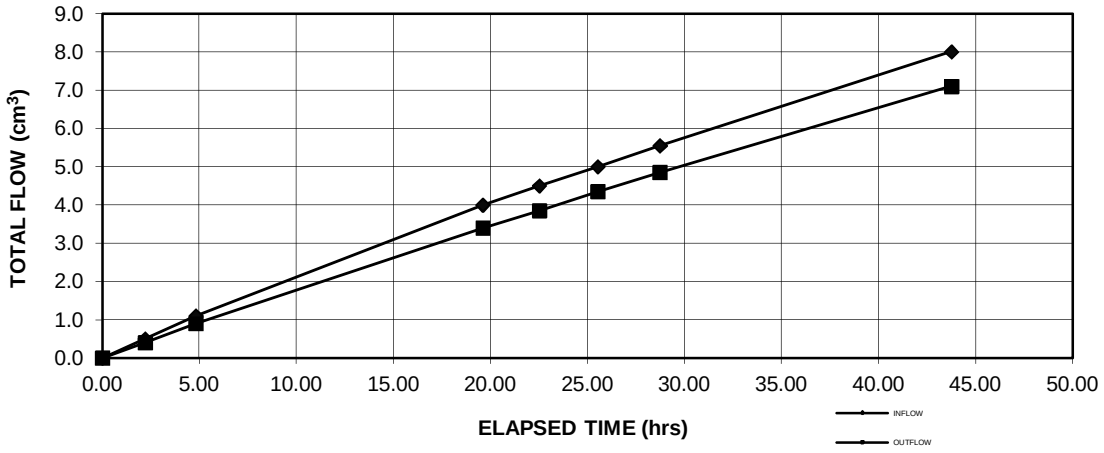
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-060	Avg. Effective Consol. Pressure (psi):	6.25

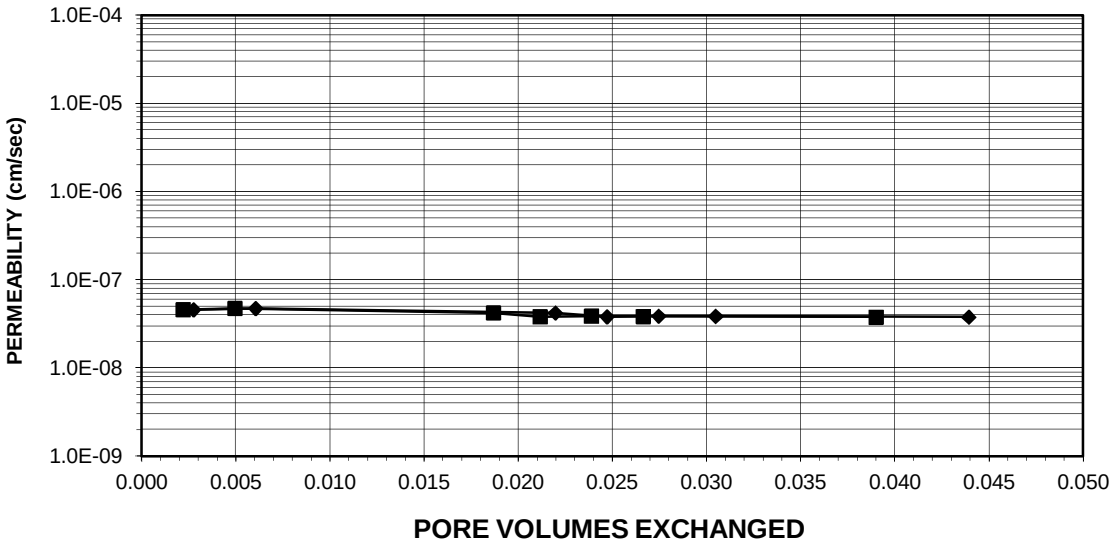
AVERAGE PERMEABILITY = 3.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.8E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-060	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	562	545
Weight of Tare & Wet Sample (g)	219.00	712.17
Weight of Tare & Dry Sample (g)	179.26	546.02
Weight of Tare (g)	84.04	82.55
Weight of Water (g)	39.74	166.15
Weight of Dry Sample (g)	95.22	463.47
Moisture Content (%)	**41.7**	**35.8**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	631.18	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	631.18	604.97
Length 1 (in)	2.944	2.957
Length 2 (in)	3.011	3.013
Length 3 (in)	2.960	2.967
Top Diameter (in)	3.008	3.003
Middle Diameter (in)	3.009	3.010
Bottom Diameter (in)	3.004	3.013
Average Length (in)	2.97	2.98
Average Area (in^2)	7.10	7.11
Sample Volume (cm^3)	345.83	347.06
Unit Wet Weight (g/cm^3)	1.83	1.74
Unit Wet Weight (pcf)	113.9	108.8
Unit Dry Weight (pcf)	80.4	80.1
Unit Dry Weight (g/cm^3)	1.29	1.28
Void Ratio, e	1.10	1.10
Porosity, n	0.52	0.52
Pore Volume (cm^3)	180.9	182.1
Total Weight of Sample After Test (g)		638.23

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-3-7
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-060	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.23

Final Sample Dimensions	
Sample Length (cm), L	7.57
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.87
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	96

AVERAGE PERMEABILITY = 3.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.8E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	11	34	0.000	0.0	0.0	196.8	0	21.5	NA
1/18/23	13	46	2.200	0.5	0.4	195.8	0	21.5	4.6E-08
1/18/23	16	23	4.817	1.1	0.9	194.7	0	21.5	4.7E-08
1/19/23	7	10	19.600	4.0	3.4	189.1	0	21.2	4.2E-08
1/19/23	10	5	22.517	4.5	3.9	188.1	0	21.4	3.8E-08
1/19/23	13	6	25.533	5.0	4.4	187.1	0	21.7	3.9E-08
1/19/23	16	18	28.733	5.6	4.9	186.0	0	21.7	3.8E-08
1/20/23	7	19	43.750	8.0	7.1	181.2	1	21.2	3.8E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-061	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.000	Top Dia. (in):	2.004
Length 2 (in):	4.000	Mid. Dia. (in):	1.998
Length 3 (in):	3.998	Bot. Dia. (in):	1.996
Avg. Length (in):	3.999	Area (in^2):	3.139

WATER CONTENT (AFTER TEST)

Tare No.:	2903
Weight of Tare & Wet Sample (g):	389.64
Weight of Tare & Dry Sample (g):	300.94
Weight of Tare (g):	8.09
% Moisture:	30.29

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	385.3	Sample Volume (cm^3):	205.8
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	385.3	Unit Wet Weight (pcf):	116.85
Avg. Diameter (in):	2.00	Moisture Content (%):	30.29
Avg. Length (in):	4.00	Unit Dry Weight (pcf):	89.69
Avg. Length (cm):	10.16		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
345	**109.89**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-062	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.016	Top Dia. (in):	2.004
Length 2 (in):	4.015	Mid. Dia. (in):	2.001
Length 3 (in):	4.014	Bot. Dia. (in):	2.000
Avg. Length (in):	4.015	Area (in^2):	3.147

WATER CONTENT (AFTER TEST)

Tare No.:	3348
Weight of Tare & Wet Sample (g):	392.95
Weight of Tare & Dry Sample (g):	305.71
Weight of Tare (g):	8.04
% Moisture:	29.31

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	385.7	Sample Volume (cm^3):	207.0
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.86
Weight of Wet Sample (g):	385.74	Unit Wet Weight (pcf):	116.26
Avg. Diameter (in):	2.00	Moisture Content (%):	29.31
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	89.91
Avg. Length (cm):	10.20		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
545	**173.19**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-063	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.970	Top Dia. (in):	2.007
Length 2 (in):	3.969	Mid. Dia. (in):	2.005
Length 3 (in):	3.968	Bot. Dia. (in):	2.003
Avg. Length (in):	3.969	Area (in^2):	3.157

WATER CONTENT (AFTER TEST)

Tare No.:	3250
Weight of Tare & Wet Sample (g):	388.42
Weight of Tare & Dry Sample (g):	302.24
Weight of Tare (g):	8.10
% Moisture:	29.30

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	381.2	Sample Volume (cm^3):	205.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.86
Weight of Wet Sample (g):	381.24	Unit Wet Weight (pcf):	115.85
Avg. Diameter (in):	2.01	Moisture Content (%):	29.30
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	89.60
Avg. Length (cm):	10.08		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
815	**258.13**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

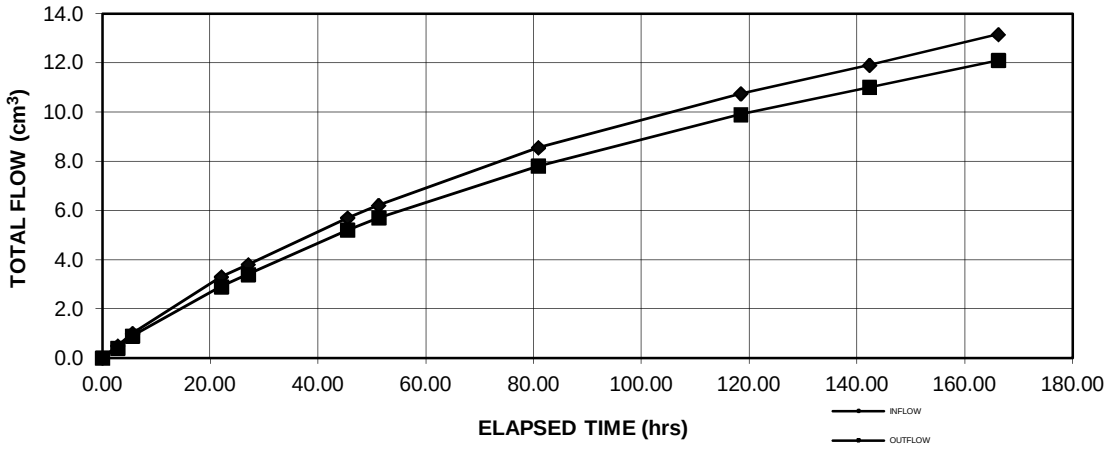
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-064	Avg. Effective Consol. Pressure (psi):	6.25

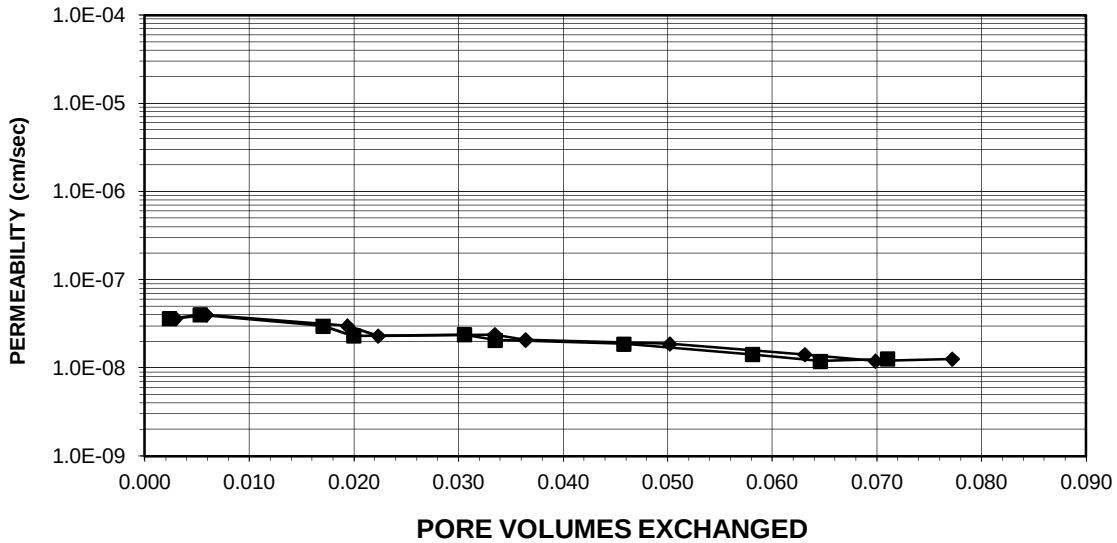
AVERAGE PERMEABILITY = 1.4E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.4E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	11/12/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-064	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1596	627
Weight of Tare & Wet Sample (g)	389.31	744.21
Weight of Tare & Dry Sample (g)	318.70	582.15
Weight of Tare (g)	96.25	86.21
Weight of Water (g)	70.61	162.06
Weight of Dry Sample (g)	222.45	495.94
Moisture Content (%)	**31.7**	**32.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	657.49	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	657.49	662.16
Length 1 (in)	3.078	3.094
Length 2 (in)	3.036	3.031
Length 3 (in)	3.093	3.020
Top Diameter (in)	3.001	3.007
Middle Diameter (in)	3.005	3.015
Bottom Diameter (in)	3.011	3.005
Average Length (in)	3.07	3.05
Average Area (in^2)	7.10	7.11
Sample Volume (cm^3)	356.84	355.22
Unit Wet Weight (g/cm^3)	1.84	1.86
Unit Wet Weight (pcf)	115.0	116.4
Unit Dry Weight (pcf)	87.3	87.7
Unit Dry Weight (g/cm^3)	1.40	1.40
Void Ratio, e	0.93	0.92
Porosity, n	0.48	0.48
Pore Volume (cm^3)	172.0	170.4
Total Weight of Sample After Test (g)		667.92

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 11/12/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-064	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.70

Final Sample Dimensions	
Sample Length (cm), L	7.74
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.88
Inflow Burette Area (cm^2), a-in	0.866
Outflow Burette Area (cm^2), a-out	0.976
B Parameter (%)	95

AVERAGE PERMEABILITY = 1.4E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.4E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	9	45	0.000	0.0	0.0	203.1	0	21.3	NA
1/4/23	12	32	2.783	0.5	0.4	202.1	0	21.6	3.6E-08
1/4/23	15	18	5.550	1.0	0.9	201.0	0	21.9	4.0E-08
1/5/23	7	47	22.033	3.3	2.9	196.3	0	21.2	3.0E-08
1/5/23	12	47	27.033	3.8	3.4	195.2	0	21.4	2.3E-08
1/6/23	7	12	45.450	5.7	5.2	191.2	0	20.9	2.4E-08
1/6/23	12	58	51.217	6.2	5.7	190.1	0	21.0	2.1E-08
1/7/23	18	37	80.867	8.6	7.8	185.3	0	20.1	1.9E-08
1/9/23	8	10	118.417	10.8	9.9	180.6	0	21.2	1.4E-08
1/10/23	8	2	142.283	11.9	11.0	178.1	0	21.2	1.2E-08
1/11/23	7	57	166.200	13.2	12.1	175.6	1	21.2	1.3E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 11/12/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

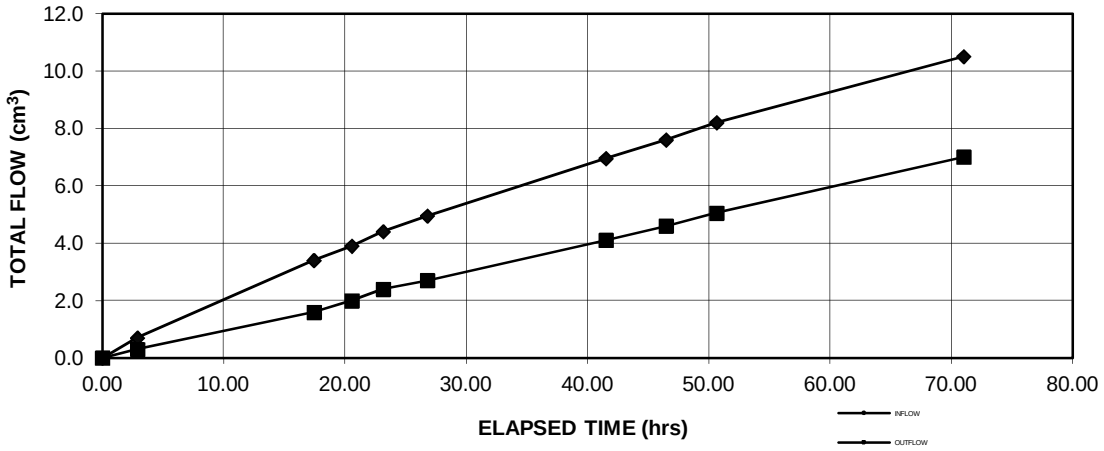
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-065	Avg. Effective Consol. Pressure (psi):	6.25

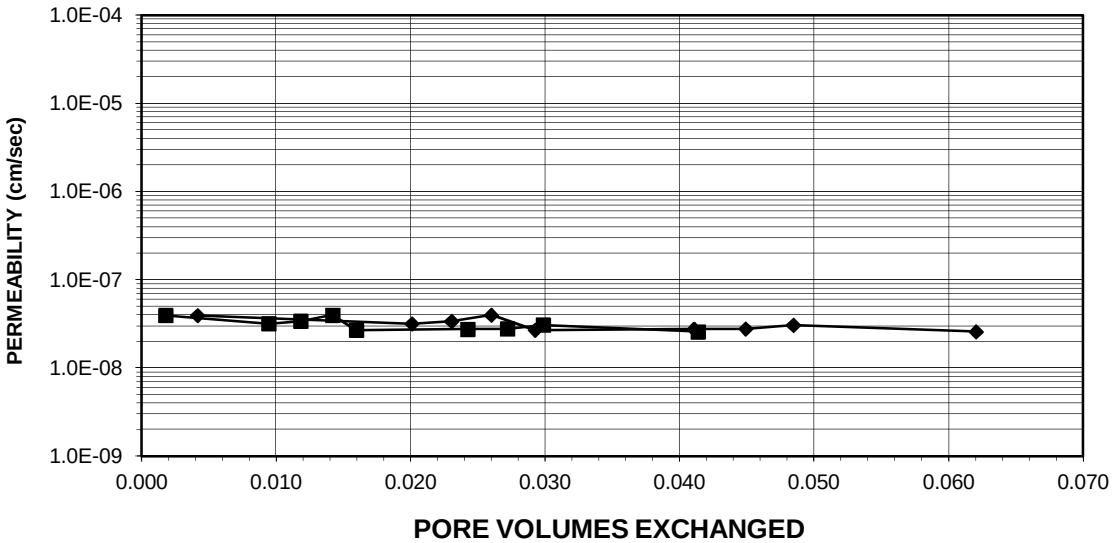
AVERAGE PERMEABILITY = 2.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.8E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/17/23	Checked By:	JLK	Date:	1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-065	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	916	904
Weight of Tare & Wet Sample (g)	335.74	767.39
Weight of Tare & Dry Sample (g)	280.94	605.20
Weight of Tare (g)	109.51	109.59
Weight of Water (g)	54.80	162.19
Weight of Dry Sample (g)	171.43	495.61
Moisture Content (%)	**32.0**	**32.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	653.95	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	653.95	657.71
Length 1 (in)	3.019	3.026
Length 2 (in)	3.044	3.045
Length 3 (in)	3.031	3.036
Top Diameter (in)	3.008	3.008
Middle Diameter (in)	3.009	3.007
Bottom Diameter (in)	3.006	3.000
Average Length (in)	3.03	3.04
Average Area (in^2)	7.10	7.09
Sample Volume (cm^3)	352.93	352.80
Unit Wet Weight (g/cm^3)	1.85	1.86
Unit Wet Weight (pcf)	115.7	116.4
Unit Dry Weight (pcf)	87.6	87.7
Unit Dry Weight (g/cm^3)	1.40	1.40
Void Ratio, e	0.92	0.92
Porosity, n	0.48	0.48
Pore Volume (cm^3)	169.4	169.3
Total Weight of Sample After Test (g)		664.20

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-065	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.79

Final Sample Dimensions	
Sample Length (cm), L	7.71
Sample Diameter (cm)	7.63
Sample Area (cm^2), A	45.76
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	98

AVERAGE PERMEABILITY = 2.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.8E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	13	34	0.000	0.0	0.0	196.8	0	21.9	NA
1/18/23	16	27	2.883	0.7	0.3	195.7	0	21.9	3.9E-08
1/19/23	7	0	17.433	3.4	1.6	191.6	0	21.7	3.2E-08
1/19/23	10	7	20.550	3.9	2.0	190.7	0	21.7	3.4E-08
1/19/23	12	43	23.150	4.4	2.4	189.7	0	22.7	4.0E-08
1/19/23	16	21	26.783	5.0	2.7	188.9	0	23.0	2.7E-08
1/20/23	7	5	41.517	7.0	4.1	185.3	0	21.8	2.7E-08
1/20/23	12	2	46.467	7.6	4.6	184.1	0	22.3	2.8E-08
1/20/23	16	12	50.633	8.2	5.1	183.1	0	21.9	3.1E-08
1/21/23	12	35	71.017	10.5	7.0	178.7	0	21.8	2.6E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-066	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.994	Top Dia. (in):	2.004
Length 2 (in):	3.993	Mid. Dia. (in):	2.003
Length 3 (in):	3.993	Bot. Dia. (in):	1.998
Avg. Length (in):	3.993	Area (in^2):	3.147

WATER CONTENT (AFTER TEST)

Tare No.:	3339
Weight of Tare & Wet Sample (g):	391.14
Weight of Tare & Dry Sample (g):	303.44
Weight of Tare (g):	8.21
% Moisture:	29.71

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	384.9	Sample Volume (cm^3):	205.9
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.87
Weight of Wet Sample (g):	384.92	Unit Wet Weight (pcf):	116.64
Avg. Diameter (in):	2.00	Moisture Content (%):	29.71
Avg. Length (in):	3.99	Unit Dry Weight (pcf):	89.93
Avg. Length (cm):	10.14		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
545	**173.19**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-067	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.001	Top Dia. (in):	2.004
Length 2 (in):	4.000	Mid. Dia. (in):	2.003
Length 3 (in):	4.000	Bot. Dia. (in):	1.998
Avg. Length (in):	4.000	Area (in^2):	3.147

WATER CONTENT (AFTER TEST)

Tare No.:	3511
Weight of Tare & Wet Sample (g):	391.09
Weight of Tare & Dry Sample (g):	302.61
Weight of Tare (g):	8.14
% Moisture:	30.05

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	383.8	Sample Volume (cm^3):	206.3
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.86
Weight of Wet Sample (g):	383.79	Unit Wet Weight (pcf):	116.09
Avg. Diameter (in):	2.00	Moisture Content (%):	30.05
Avg. Length (in):	4.00	Unit Dry Weight (pcf):	89.27
Avg. Length (cm):	10.16		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
815	**258.99**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-068	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.973	Top Dia. (in):	2.007
Length 2 (in):	3.973	Mid. Dia. (in):	2.005
Length 3 (in):	3.973	Bot. Dia. (in):	2.001
Avg. Length (in):	3.973	Area (in^2):	3.155

WATER CONTENT (AFTER TEST)

Tare No.:	3386
Weight of Tare & Wet Sample (g):	386.40
Weight of Tare & Dry Sample (g):	300.17
Weight of Tare (g):	8.20
% Moisture:	29.53

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	379.1	Sample Volume (cm^3):	205.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.85
Weight of Wet Sample (g):	379.07	Unit Wet Weight (pcf):	115.15
Avg. Diameter (in):	2.00	Moisture Content (%):	29.53
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	88.89
Avg. Length (cm):	10.09		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1260	**399.34**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

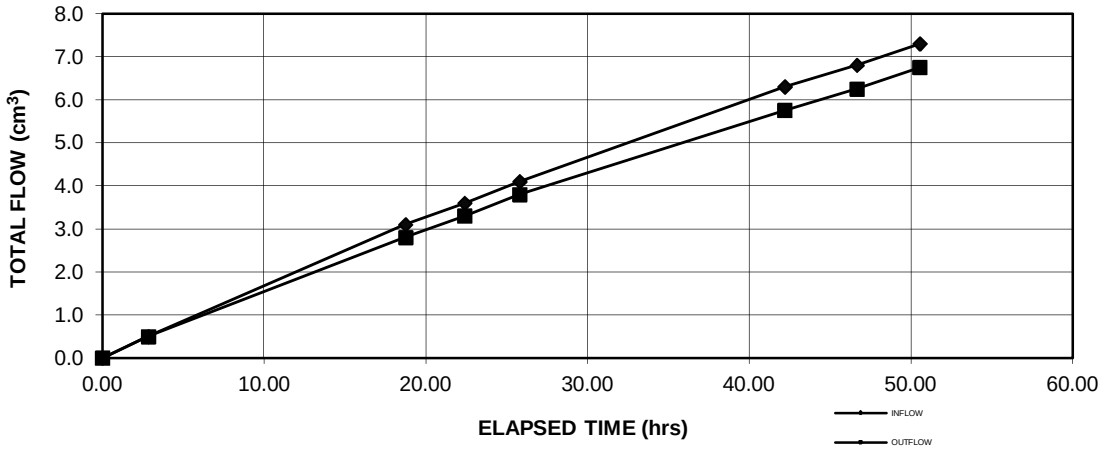
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-069	Avg. Effective Consol. Pressure (psi):	6.25

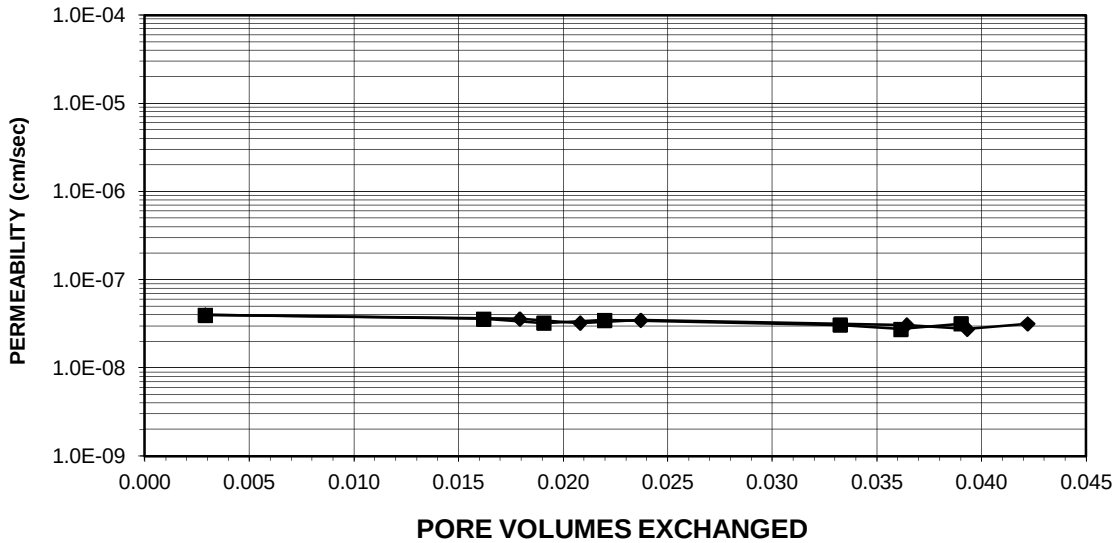
AVERAGE PERMEABILITY = 3.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-069	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	577	916
Weight of Tare & Wet Sample (g)	347.12	765.54
Weight of Tare & Dry Sample (g)	284.83	598.86
Weight of Tare (g)	84.25	109.53
Weight of Water (g)	62.29	166.68
Weight of Dry Sample (g)	200.58	489.33
Moisture Content (%)	**31.1**	**34.1**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	654.65	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	654.65	669.68
Length 1 (in)	3.078	3.109
Length 2 (in)	3.057	3.055
Length 3 (in)	3.100	3.067
Top Diameter (in)	3.002	3.004
Middle Diameter (in)	3.008	3.008
Bottom Diameter (in)	3.009	3.008
Average Length (in)	3.08	3.08
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	358.08	358.01
Unit Wet Weight (g/cm^3)	1.83	1.87
Unit Wet Weight (pcf)	114.1	116.8
Unit Dry Weight (pcf)	87.1	87.1
Unit Dry Weight (g/cm^3)	1.40	1.40
Void Ratio, e	0.94	0.94
Porosity, n	0.48	0.48
Pore Volume (cm^3)	173.1	173.0
Total Weight of Sample After Test (g)		667.57

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-069	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.49

Final Sample Dimensions	
Sample Length (cm), L	7.82
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.81
Inflow Burette Area (cm^2), a-in	0.936
Outflow Burette Area (cm^2), a-out	0.972
B Parameter (%)	99

AVERAGE PERMEABILITY = 3.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	13	1	0.000	0.0	0.0	200.9	0	21.6	NA
1/4/23	15	51	2.833	0.5	0.5	199.8	0	21.9	4.0E-08
1/5/23	7	46	18.750	3.1	2.8	194.7	0	21.2	3.6E-08
1/5/23	11	25	22.400	3.6	3.3	193.6	0	21.3	3.2E-08
1/5/23	14	49	25.800	4.1	3.8	192.6	0	21.5	3.5E-08
1/6/23	7	13	42.200	6.3	5.8	188.2	0	20.9	3.1E-08
1/6/23	11	41	46.667	6.8	6.3	187.2	0	21.0	2.8E-08
1/6/23	15	34	50.550	7.3	6.8	186.2	1	21.2	3.2E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

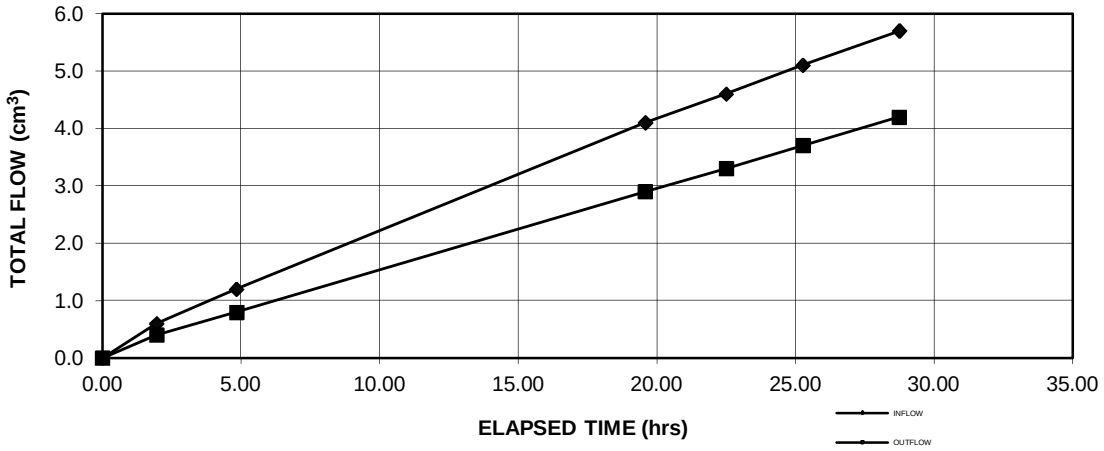
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-070	Avg. Effective Consol. Pressure (psi):	6.25

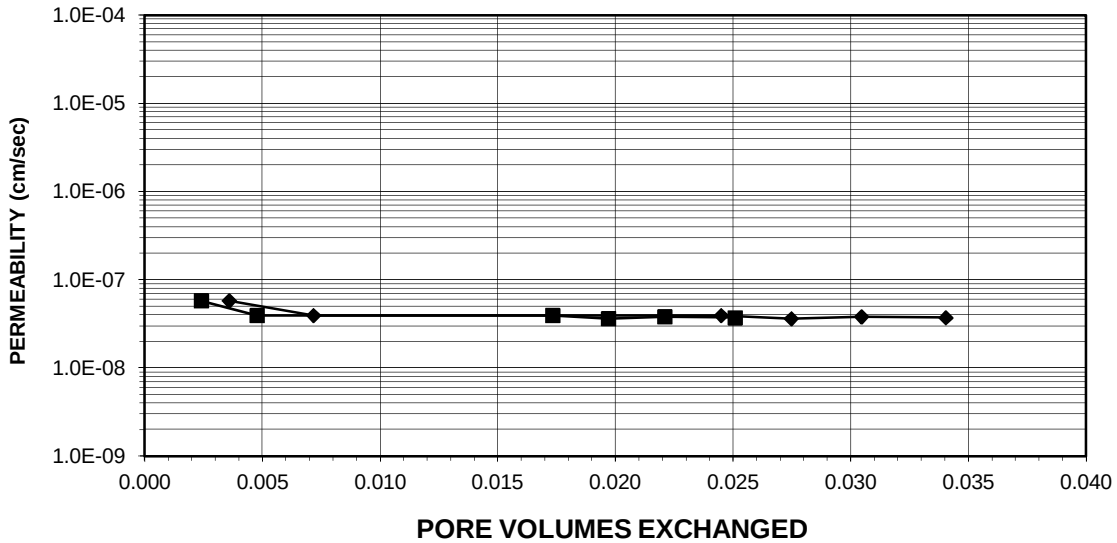
AVERAGE PERMEABILITY = 3.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.8E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/17/23	Checked By:	JLK	Date:	1/23/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-070	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	872	542
Weight of Tare & Wet Sample (g)	338.07	703.07
Weight of Tare & Dry Sample (g)	283.01	553.56
Weight of Tare (g)	109.98	81.80
Weight of Water (g)	55.06	149.51
Weight of Dry Sample (g)	173.03	471.76
Moisture Content (%)	**31.8**	**31.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	645.04	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	645.04	644.41
Length 1 (in)	2.994	2.985
Length 2 (in)	3.009	3.012
Length 3 (in)	2.989	2.988
Top Diameter (in)	3.005	3.003
Middle Diameter (in)	3.005	3.010
Bottom Diameter (in)	2.999	3.010
Average Length (in)	3.00	3.00
Average Area (in^2)	7.08	7.10
Sample Volume (cm^3)	347.89	348.70
Unit Wet Weight (g/cm^3)	1.85	1.85
Unit Wet Weight (pcf)	115.7	115.4
Unit Dry Weight (pcf)	87.8	87.6
Unit Dry Weight (g/cm^3)	1.41	1.40
Void Ratio, e	0.92	0.92
Porosity, n	0.48	0.48
Pore Volume (cm^3)	166.7	167.5
Total Weight of Sample After Test (g)		648.99

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-5-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-070	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.10

Final Sample Dimensions	
Sample Length (cm), L	7.61
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.84
Inflow Burette Area (cm^2), a-in	0.962
Outflow Burette Area (cm^2), a-out	0.962
B Parameter (%)	98

AVERAGE PERMEABILITY = 3.8E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 3.8E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	11	34	0.000	0.0	0.0	196.8	0	21.5	NA
1/18/23	13	31	1.950	0.6	0.4	195.7	0	21.5	5.8E-08
1/18/23	16	24	4.833	1.2	0.8	194.7	0	21.5	3.9E-08
1/19/23	7	9	19.583	4.1	2.9	189.5	0	21.2	3.9E-08
1/19/23	10	4	22.500	4.6	3.3	188.6	0	21.4	3.6E-08
1/19/23	12	50	25.267	5.1	3.7	187.7	0	21.7	3.8E-08
1/19/23	16	19	28.750	5.7	4.2	186.5	1	21.7	3.7E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/23/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-071	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.994	Top Dia. (in):	2.000
Length 2 (in):	3.993	Mid. Dia. (in):	1.998
Length 3 (in):	3.993	Bot. Dia. (in):	1.995
Avg. Length (in):	3.993	Area (in^2):	3.134

WATER CONTENT (AFTER TEST)

Tare No.:	3273
Weight of Tare & Wet Sample (g):	403.98
Weight of Tare & Dry Sample (g):	321.13
Weight of Tare (g):	8.11
% Moisture:	26.47

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	397.6	Sample Volume (cm^3):	205.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.94
Weight of Wet Sample (g):	397.63	Unit Wet Weight (pcf):	120.97
Avg. Diameter (in):	2.00	Moisture Content (%):	26.47
Avg. Length (in):	3.99	Unit Dry Weight (pcf):	95.66
Avg. Length (cm):	10.14		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
235	**74.98**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	16 Day
Lab ID:	2022-833-002-072	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.020	Top Dia. (in):	2.007
Length 2 (in):	4.018	Mid. Dia. (in):	2.005
Length 3 (in):	4.017	Bot. Dia. (in):	2.000
Avg. Length (in):	4.018	Area (in^2):	3.154

WATER CONTENT (AFTER TEST)

Tare No.:	3000
Weight of Tare & Wet Sample (g):	403.76
Weight of Tare & Dry Sample (g):	320.44
Weight of Tare (g):	8.05
% Moisture:	26.67

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	397.2	Sample Volume (cm^3):	207.7
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.91
Weight of Wet Sample (g):	397.17	Unit Wet Weight (pcf):	119.32
Avg. Diameter (in):	2.00	Moisture Content (%):	26.67
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	94.20
Avg. Length (cm):	10.21		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
510	**161.69**

Tested By JAC Date 1/6/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-073	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.981	Top Dia. (in):	2.005
Length 2 (in):	3.979	Mid. Dia. (in):	2.002
Length 3 (in):	3.979	Bot. Dia. (in):	2.000
Avg. Length (in):	3.980	Area (in^2):	3.149

WATER CONTENT (AFTER TEST)

Tare No.:	3342
Weight of Tare & Wet Sample (g):	400.29
Weight of Tare & Dry Sample (g):	319.37
Weight of Tare (g):	8.18
% Moisture:	26.00

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	393.1	Sample Volume (cm^3):	205.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.91
Weight of Wet Sample (g):	393.05	Unit Wet Weight (pcf):	119.43
Avg. Diameter (in):	2.00	Moisture Content (%):	26.00
Avg. Length (in):	3.98	Unit Dry Weight (pcf):	94.79
Avg. Length (cm):	10.11		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
720	**228.65**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

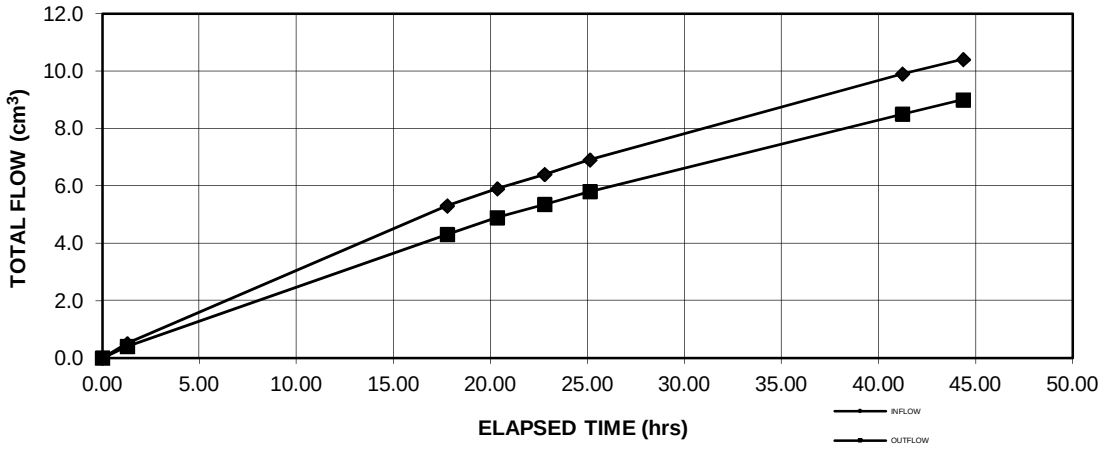
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-074	Avg. Effective Consol. Pressure (psi):	6.25

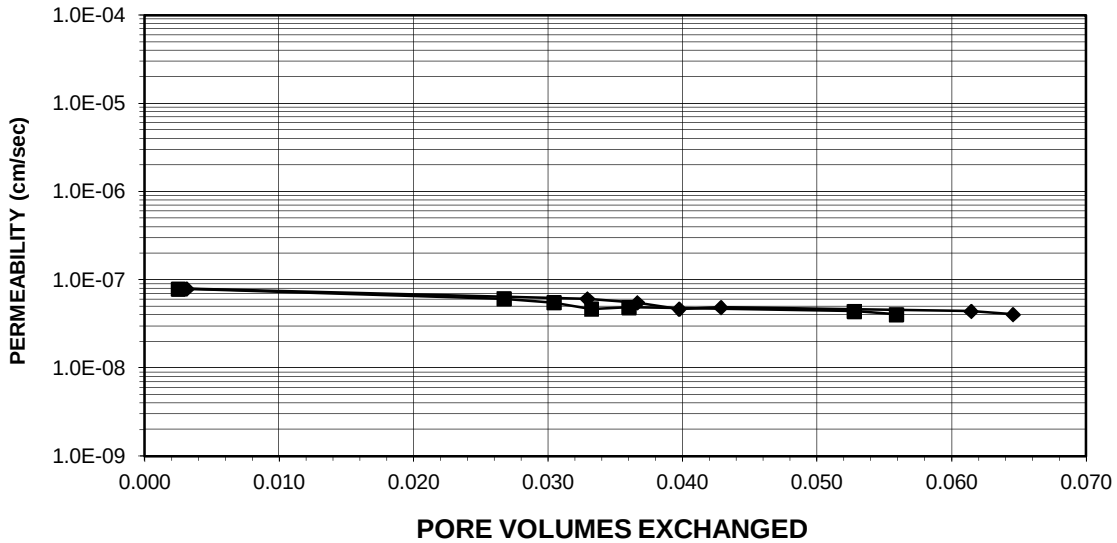
AVERAGE PERMEABILITY = 4.5E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 4.5E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-074	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1722	1722
Weight of Tare & Wet Sample (g)	271.50	748.50
Weight of Tare & Dry Sample (g)	228.86	598.48
Weight of Tare (g)	81.10	81.08
Weight of Water (g)	42.64	150.02
Weight of Dry Sample (g)	147.76	517.40
Moisture Content (%)	**28.9**	**29.0**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	676.93	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	676.93	677.65
Length 1 (in)	3.066	2.994
Length 2 (in)	3.004	3.080
Length 3 (in)	3.065	3.095
Top Diameter (in)	3.010	3.003
Middle Diameter (in)	3.009	3.010
Bottom Diameter (in)	3.000	3.008
Average Length (in)	3.05	3.06
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	354.20	355.68
Unit Wet Weight (g/cm^3)	1.91	1.91
Unit Wet Weight (pcf)	119.3	118.9
Unit Dry Weight (pcf)	92.6	92.2
Unit Dry Weight (g/cm^3)	1.48	1.48
Void Ratio, e	0.82	0.83
Porosity, n	0.45	0.45
Pore Volume (cm^3)	159.6	161.1
Total Weight of Sample After Test (g)		682.75

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-074	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.64

Final Sample Dimensions	
Sample Length (cm), L	7.76
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.82
Inflow Burette Area (cm^2), a-in	0.852
Outflow Burette Area (cm^2), a-out	0.862
B Parameter (%)	96

AVERAGE PERMEABILITY = 4.5E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 4.5E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/4/23	14	0	0.000	0.0	0.0	203.7	0	21.7	NA
1/4/23	15	16	1.267	0.5	0.4	202.7	0	21.9	7.8E-08
1/5/23	7	46	17.767	5.3	4.3	192.5	0	21.2	6.1E-08
1/5/23	10	21	20.350	5.9	4.9	191.1	0	21.3	5.5E-08
1/5/23	12	47	22.783	6.4	5.4	190.0	0	21.4	4.7E-08
1/5/23	15	7	25.117	6.9	5.8	188.9	0	21.6	4.9E-08
1/6/23	7	14	41.233	9.9	8.5	182.3	0	20.9	4.4E-08
1/6/23	10	22	44.367	10.4	9.0	181.1	1	21.0	4.0E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/9/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

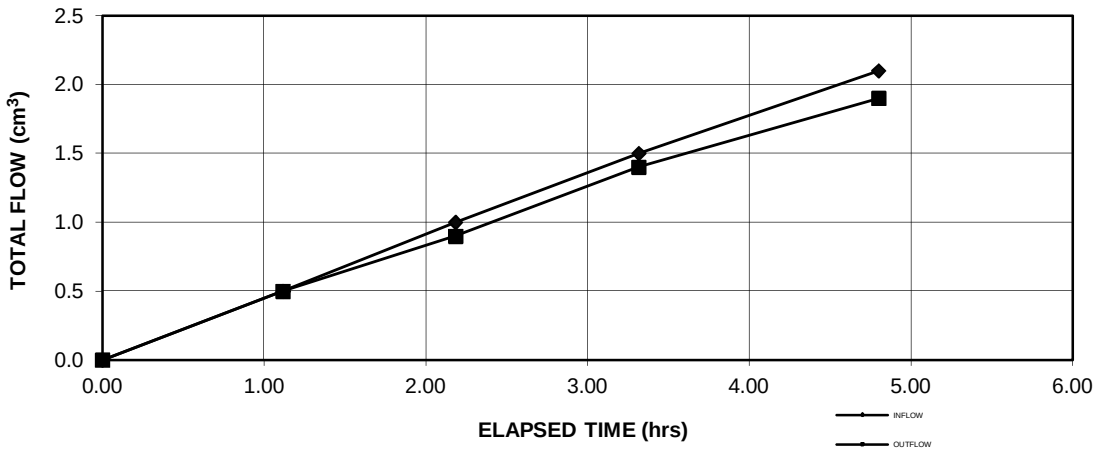
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-075	Avg. Effective Consol. Pressure (psi):	6.25

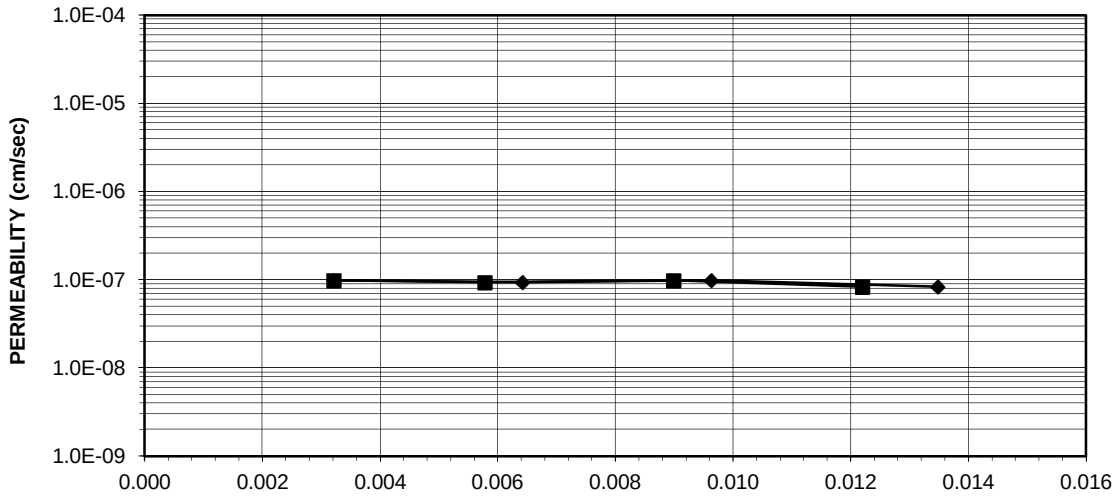
AVERAGE PERMEABILITY = 9.3E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.3E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/17/23	Checked By:	JLK	Date:	1/20/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-075	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	871	1705
Weight of Tare & Wet Sample (g)	279.65	741.53
Weight of Tare & Dry Sample (g)	241.51	596.63
Weight of Tare (g)	110.10	82.73
Weight of Water (g)	38.14	144.90
Weight of Dry Sample (g)	131.41	513.90
Moisture Content (%)	**29.0**	**28.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	667.93	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	667.93	663.65
Length 1 (in)	3.015	3.009
Length 2 (in)	2.972	2.973
Length 3 (in)	3.019	2.977
Top Diameter (in)	3.008	3.003
Middle Diameter (in)	3.007	3.007
Bottom Diameter (in)	3.002	3.011
Average Length (in)	3.00	2.99
Average Area (in^2)	7.10	7.10
Sample Volume (cm^3)	349.05	347.53
Unit Wet Weight (g/cm^3)	1.91	1.91
Unit Wet Weight (pcf)	119.4	119.2
Unit Dry Weight (pcf)	92.6	93.0
Unit Dry Weight (g/cm^3)	1.48	1.49
Void Ratio, e	0.82	0.81
Porosity, n	0.45	0.45
Pore Volume (cm^3)	157.3	155.8
Total Weight of Sample After Test (g)		674.99

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-1
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-075	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	23.17

Final Sample Dimensions	
Sample Length (cm), L	7.59
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.82
Inflow Burette Area (cm^2), a-in	0.918
Outflow Burette Area (cm^2), a-out	0.907
B Parameter (%)	95

AVERAGE PERMEABILITY = 9.3E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 9.3E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/18/23	11	36	0.000	0.0	0.0	201.9	0	21.5	NA
1/18/23	12	43	1.117	0.5	0.5	200.8	0	21.6	9.8E-08
1/18/23	13	47	2.183	1.0	0.9	199.8	0	21.5	9.3E-08
1/18/23	14	55	3.317	1.5	1.4	198.7	0	21.5	9.8E-08
1/18/23	16	24	4.800	2.1	1.9	197.5	1	21.5	8.3E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/20/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	7 Day
Lab ID:	2022-833-002-076	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.020	Top Dia. (in):	2.006
Length 2 (in):	4.018	Mid. Dia. (in):	2.004
Length 3 (in):	4.017	Bot. Dia. (in):	1.997
Avg. Length (in):	4.018	Area (in^2):	3.149

WATER CONTENT (AFTER TEST)

Tare No.:	3038
Weight of Tare & Wet Sample (g):	404.44
Weight of Tare & Dry Sample (g):	320.07
Weight of Tare (g):	8.11
% Moisture:	27.05

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	398.4	Sample Volume (cm^3):	207.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.92
Weight of Wet Sample (g):	398.39	Unit Wet Weight (pcf):	119.89
Avg. Diameter (in):	2.00	Moisture Content (%):	27.05
Avg. Length (in):	4.02	Unit Dry Weight (pcf):	94.37
Avg. Length (cm):	10.21		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
410	**130.20**

Tested By JAC Date 12/27/22 Input Checked By JLK Date 1/26/23

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID:	2022-833-002-077	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	4.008	Top Dia. (in):	2.004
Length 2 (in):	4.007	Mid. Dia. (in):	2.002
Length 3 (in):	4.006	Bot. Dia. (in):	1.996
Avg. Length (in):	4.007	Area (in^2):	3.144

WATER CONTENT (AFTER TEST)

Tare No.:	3380
Weight of Tare & Wet Sample (g):	409.16
Weight of Tare & Dry Sample (g):	325.10
Weight of Tare (g):	8.34
% Moisture:	26.54

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	402.2	Sample Volume (cm^3):	206.4
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.95
Weight of Wet Sample (g):	402.16	Unit Wet Weight (pcf):	121.57
Avg. Diameter (in):	2.00	Moisture Content (%):	26.54
Avg. Length (in):	4.01	Unit Dry Weight (pcf):	96.07
Avg. Length (cm):	10.18		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
780	**248.12**

Tested By JAC Date 1/3/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D2166-16 / AASHTO T208-10 (Modified-Peak Load Only) (SOP S-30)

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Reference:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID:	2022-833-002-078	Visual Description:	Brown Stabilized Material

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	3.967	Top Dia. (in):	2.006
Length 2 (in):	3.966	Mid. Dia. (in):	2.005
Length 3 (in):	3.966	Bot. Dia. (in):	2.003
Avg. Length (in):	3.966	Area (in^2):	3.156

WATER CONTENT (AFTER TEST)

Tare No.:	3012
Weight of Tare & Wet Sample (g):	397.19
Weight of Tare & Dry Sample (g):	317.13
Weight of Tare (g):	8.26
% Moisture:	25.92

UNIT WEIGHT

Weight of Tube & Wet Sample (g):	389.8	Sample Volume (cm^3):	205.1
Weight of Tube (g):	0.00	Unit Wet Weight (g/cm^3):	1.90
Weight of Wet Sample (g):	389.83	Unit Wet Weight (pcf):	118.58
Avg. Diameter (in):	2.00	Moisture Content (%):	25.92
Avg. Length (in):	3.97	Unit Dry Weight (pcf):	94.17
Avg. Length (cm):	10.07		

ELECTRONIC DEVICE LOAD (lb)	*STRESS (psi)*
1130	**358.02**

Tested By JAC Date 1/17/23 Input Checked By JLK Date 1/26/23

DCN: CT-S30A DATE: 11/09/09 REVISION: 4

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PERMEABILITY TEST

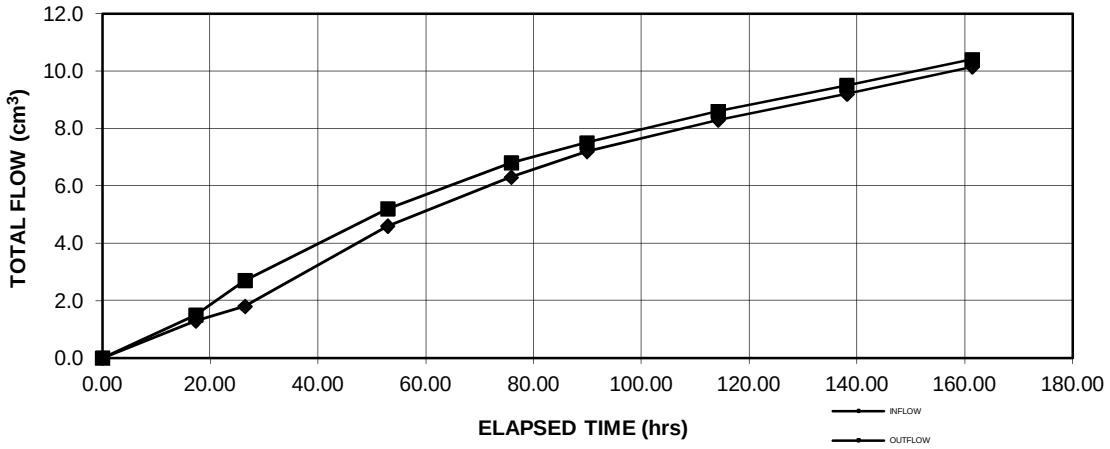
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-079	Avg. Effective Consol. Pressure (psi):	6.25

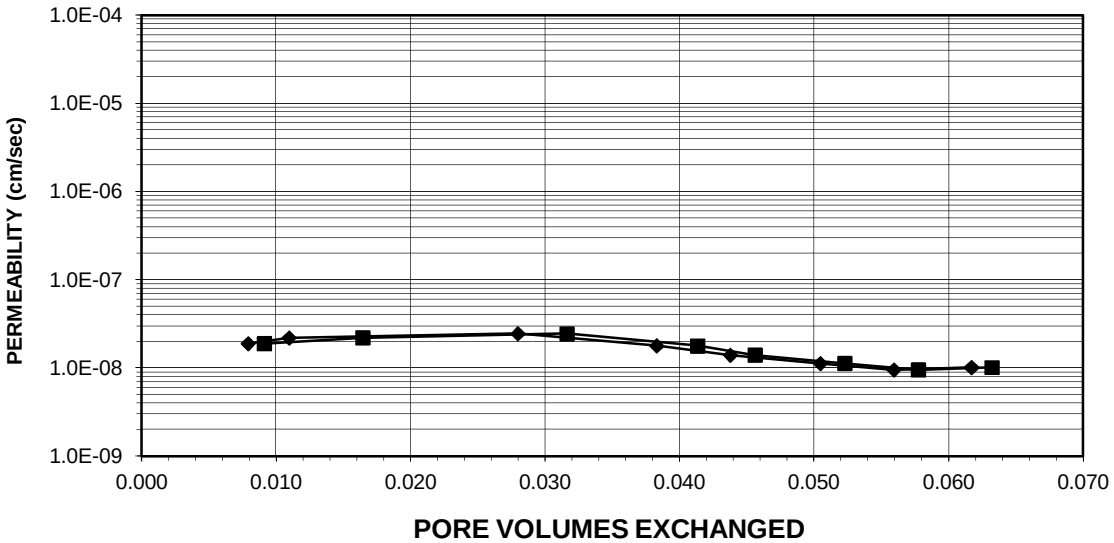
AVERAGE PERMEABILITY = 1.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By:	JG	Date:	1/3/23	Checked By:	JLK	Date:	1/13/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-079	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	203	1693
Weight of Tare & Wet Sample (g)	286.12	737.21
Weight of Tare & Dry Sample (g)	244.16	591.29
Weight of Tare (g)	98.60	82.59
Weight of Water (g)	41.96	145.92
Weight of Dry Sample (g)	145.56	508.70
Moisture Content (%)	**28.8**	**28.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	687.70	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	687.70	686.94
Length 1 (in)	3.064	3.081
Length 2 (in)	3.131	3.148
Length 3 (in)	3.109	3.105
Top Diameter (in)	3.005	3.002
Middle Diameter (in)	3.005	3.009
Bottom Diameter (in)	3.006	3.012
Average Length (in)	3.10	3.11
Average Area (in^2)	7.09	7.10
Sample Volume (cm^3)	360.52	362.24
Unit Wet Weight (g/cm^3)	1.91	1.90
Unit Wet Weight (pcf)	119.1	118.4
Unit Dry Weight (pcf)	92.4	92.0
Unit Dry Weight (g/cm^3)	1.48	1.47
Void Ratio, e	0.82	0.83
Porosity, n	0.45	0.45
Pore Volume (cm^3)	162.8	164.5
Total Weight of Sample After Test (g)		695.73

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/13/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	14 Day
Lab ID No.:	2022-833-002-079	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	87.5
Bottom Cap (psi)	90.0
Cell (psi)	95.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.24

Final Sample Dimensions	
Sample Length (cm), L	7.90
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.84
Inflow Burette Area (cm^2), a-in	1.002
Outflow Burette Area (cm^2), a-out	0.915
B Parameter (%)	99

AVERAGE PERMEABILITY = 1.1E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.1E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/5/23	13	53	0.000	0.0	0.0	206.3	0	21.5	NA
1/6/23	7	11	17.300	1.3	1.5	203.3	0	20.9	1.9E-08
1/6/23	16	18	26.417	1.8	2.7	201.5	0	21.2	2.2E-08
1/7/23	18	47	52.900	4.6	5.2	195.9	0	20.1	2.4E-08
1/8/23	17	43	75.833	6.3	6.8	192.4	0	20.4	1.8E-08
1/9/23	7	46	89.883	7.2	7.5	190.7	0	21.2	1.4E-08
1/10/23	8	7	114.233	8.3	8.6	188.3	0	21.2	1.1E-08
1/11/23	8	0	138.117	9.2	9.5	186.4	0	21.2	9.5E-09
1/12/23	7	16	161.383	10.2	10.4	184.5	1	21.2	1.0E-08

Tested By: JG Date: 1/3/23 Checked By: JLK Date: 1/13/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

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PERMEABILITY TEST

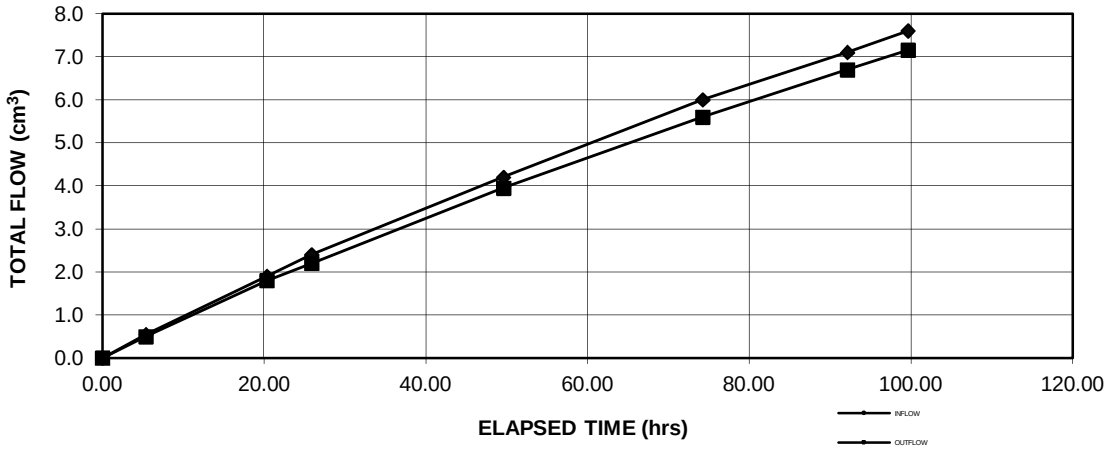
ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-080	Avg. Effective Consol. Pressure (psi):	6.25

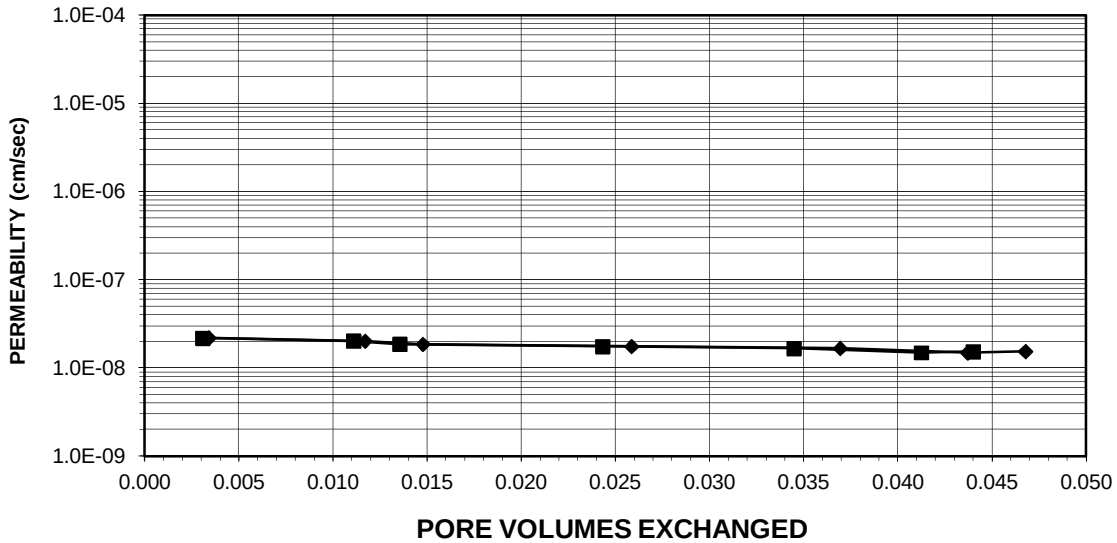
AVERAGE PERMEABILITY = 1.6E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.6E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-080	Avg. Effective Consol. Pressure (psi):	6.25

Specific Gravity:	2.70	Assumed
Sample Condition:	Previously	Remolded

Visual Description: Brown Stabilized Material

Permeant Type: Deaired Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	629	894
Weight of Tare & Wet Sample (g)	200.31	789.80
Weight of Tare & Dry Sample (g)	174.28	638.38
Weight of Tare (g)	85.79	109.81
Weight of Water (g)	26.03	151.42
Weight of Dry Sample (g)	88.49	528.57
Moisture Content (%)	**29.4**	**28.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Weight of Tube & Wet Sample (g)	683.06	NA
Weight of Tube (g)	0.00	NA
Weight of Wet Sample (g)	683.06	679.00
Length 1 (in)	3.051	3.041
Length 2 (in)	3.108	3.113
Length 3 (in)	3.056	3.067
Top Diameter (in)	3.008	3.003
Middle Diameter (in)	3.005	3.008
Bottom Diameter (in)	3.005	3.013
Average Length (in)	3.07	3.07
Average Area (in^2)	7.10	7.11
Sample Volume (cm^3)	357.23	357.93
Unit Wet Weight (g/cm^3)	1.91	1.90
Unit Wet Weight (pcf)	119.4	118.4
Unit Dry Weight (pcf)	92.2	92.0
Unit Dry Weight (g/cm^3)	1.48	1.47
Void Ratio, e	0.83	0.83
Porosity, n	0.45	0.45
Pore Volume (cm^3)	161.7	162.5
Total Weight of Sample After Test (g)		691.18

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

PERMEABILITY TEST

ASTM D 5084-16a Method C

Client:	Geo-Solutions, Inc.	Boring No.:	12/20/22
Client Project:	Manhattan, NY 21-054	Depth (ft):	M-6-2
Project No.:	2022-833-002	Sample No.:	28 Day
Lab ID No.:	2022-833-002-080	Avg. Effective Consol. Pressure (psi):	6.25

Pressure Heads (Constant)	
Top Cap (psi)	67.5
Bottom Cap (psi)	70.0
Cell (psi)	75.0
Total Pressure Head (cm)	175.8
Hydraulic Gradient	22.51

Final Sample Dimensions	
Sample Length (cm), L	7.81
Sample Diameter (cm)	7.64
Sample Area (cm^2), A	45.85
Inflow Burette Area (cm^2), a-in	0.911
Outflow Burette Area (cm^2), a-out	0.968
B Parameter (%)	97

AVERAGE PERMEABILITY = 1.6E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.6E-10 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
1/19/23	10	58	0.000	0.0	0.0	202.6	0	21.5	NA
1/19/23	16	20	5.367	0.6	0.5	201.4	0	21.7	2.2E-08
1/20/23	7	18	20.333	1.9	1.8	198.7	0	21.2	2.0E-08
1/20/23	12	50	25.867	2.4	2.2	197.7	0	21.6	1.9E-08
1/21/23	12	34	49.600	4.2	4.0	194.0	0	20.9	1.7E-08
1/22/23	13	12	74.233	6.0	5.6	190.3	0	21.0	1.7E-08
1/23/23	7	7	92.150	7.1	6.7	188.0	0	20.9	1.5E-08
1/23/23	14	36	99.633	7.6	7.2	187.0	1	21.4	1.5E-08

Tested By: JG Date: 1/17/23 Checked By: JLK Date: 1/24/23

DCN: CT-22 DATE: 1/1/17 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

PARSONS

TECHNICAL MEMORANDUM

Subject: Soil Stabilization Mass Flux Modeling Documentation, 45th Street, New York City, New York

Date: July 20, 2023

In-situ soil stabilization (ISS) is the selected remedy for the Consolidated Edison Company of New York (ConEd) manufactured gas plant (MGP) site located at 45th Street in New York City, New York (Site). As an action detailed in the Remedial Design Work Plan (RDWP), large-scale soil samples were collected from the Site and used by GeoSolutions Inc (GSI) to perform a bench-scale treatability study to evaluate potential ISS soil and reagent mixes for use at the Site. Sample cylinders from M-3-1, M-3-2, M-3-5, M-3-7, M-5-1, and M-5-2 soil-reagent mixes (concrete mixes) were transferred to Parsons' custody via Eurofins for the purpose of completing Synthetic Precipitation Leaching Procedure (SPLP) and Leaching Environmental Assessment Framework (LEAF) 1315 (mass flux) testing. All of these mixes passed project goals for unconfined compressive strength and hydraulic conductivity, indicating the soil-reagent mixes are acceptable for use at the Site.

SPLP testing and 1315 LEAF leachate test results confirmed detections for site-related contaminates in excess of Site Remedial Objectives, including benzene, toluene, ethylbenzene, and xylene (BTEX), semi-volatile organic carbons (SVOCs) and a few polycyclic aromatic hydrocarbons (PAHs) . While SPLP detections for BTEX were below project action levels for groundwater, SPLP results showed exceedances for 1,1-biphenyl, 2-methlynapthalene, and naphthalene. Mixes M-3-1 and M-3-5 1315 LEAF results were selected for mass flux to groundwater modeling because these mixes had the highest detections of xylene and naphthalene in LEAF 1315 leachate, and the reagent mixes are the least costly with lowest percent cement and blast furnace slag materials for each mix type (soil mixing and jet grouting). The Hudson River was used as the presumed receptor for modeling purposes.

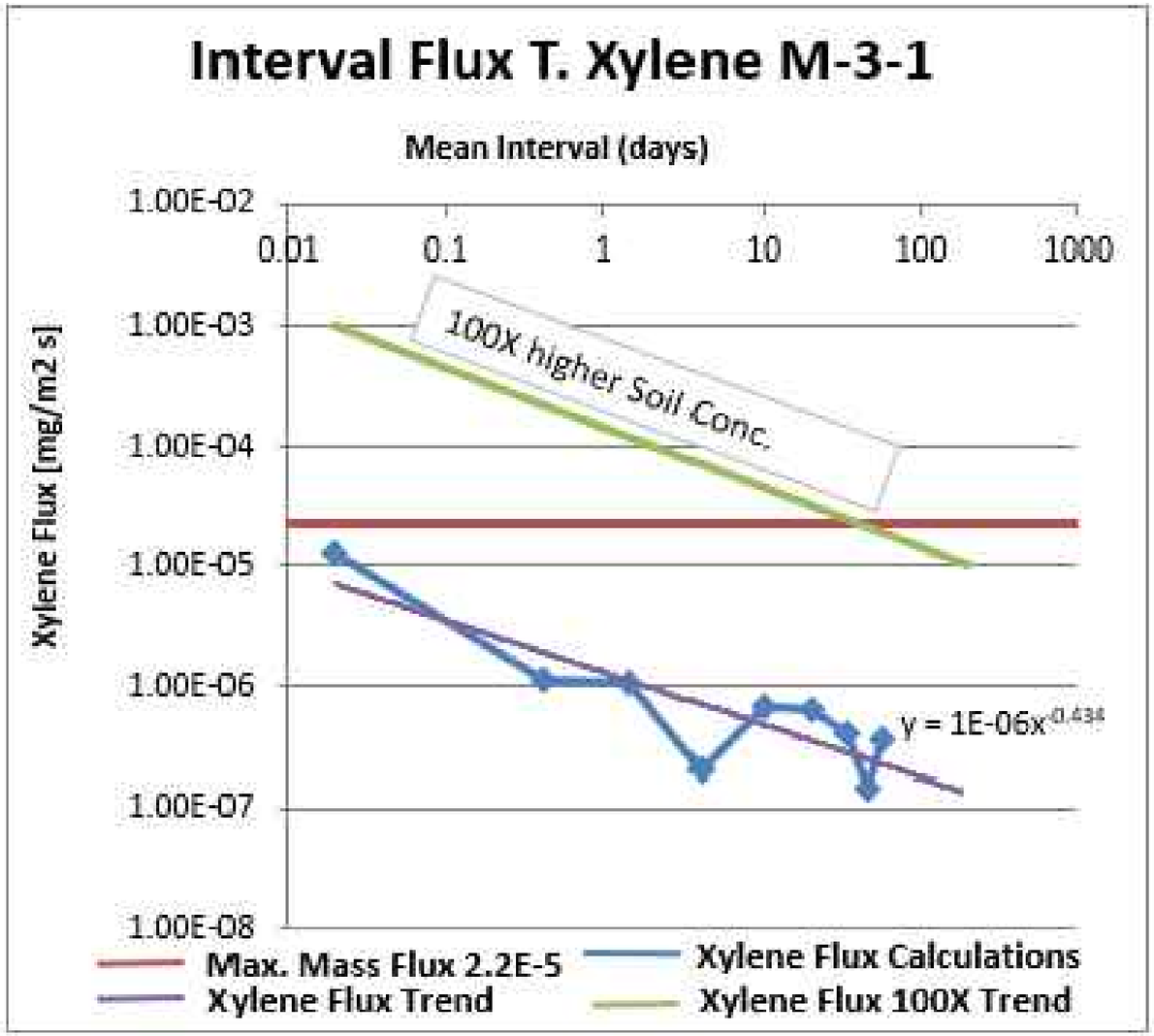
The modeling demonstrates the inherent properties of ISS to stabilize contaminates in a cement matrix and continually reduce diffusion over time. Modeling was performed according to guidance outlined in the Interstate Technology and Regulatory Council (ITRC) Development of Performance Specifications for Solidification/Stabilization, July 2011, using the Environmental Protection Agency (EPA) 1315 LEAF method for mass flux modeling (EPA 1315, January 2013). The log-log plots for xylene and naphthalene for M-3-1 (**Figure A)** and M-3-5 (**Figure B**) generated based on the mass flux calculations demonstrate that the slopes of the mass flux over time is negative. This indicates that mass flux will continue to decrease over time.

The maximum mass flux (red lines) is established, following the ITRC guidance, by applying a conservate dilution attenuation factor to the site groundwater standards to calculate a maximum allowable contaminate level in groundwater thus ensuring if the mass flux is below the maximum mass flux, groundwater flowing around the ISS stabilized footprint will achieve groundwater standards at the compliance point. For soil-reagent mix M-3-1 shown in **Figure A,** both total xylene and naphthalene mass flux trend lines (purple lines) are below the maximum mass flux (red line) that ensures that groundwater will remain below project action levels at the Hudson River. For soil-reagent mix M-3-5 shown in **Figure B**, the xylene mass flux trend line is below the maximum mass flux (red line) and the naphthalene mass flux trend line starts above the maximum mass flux (red line), but quickly drops below the project action levels after a one-day interval.

According to Crank, Mathematics of Diffusion, Oxford University Press, London, 1986, the initial mass flux trend is proportional to the initial contaminate concentration in the monolith. Therefore, it is appropriate for modeling purposes to demonstrate that where soil is stabilized having higher

concentrations of Site contaminates, the inherit properties of the stabilized soil will inhibit mass flux to Site groundwater, and the mass flux will continue to decrease over time. **Figure A** also presents the xylene and naphthalene mass flux 100X trend lines, which assumes the initial mass flux concentration is two orders of magnitude higher. They are represented by the green lines shown on the xylene and naphthalene graphs for mix M-3-1. The higher concentration parallel lines cross the maximum contaminant flux (red line) after approximately 100 days. The results are similar for xylene for the mix M-3-5 presented in **Figure B**; however, naphthalene results achieve similar results at the mass flux 10X trend line, which is one order of magnitude higher. This indicates that ISS mix M-3-5 is less robust for higher naphthalene concentrations than M-3-1, but still shows the inherit properties of the stabilized soil will inhibit mass flux to Site groundwater, and the mass flux will continue to decrease over time.

FIGURES



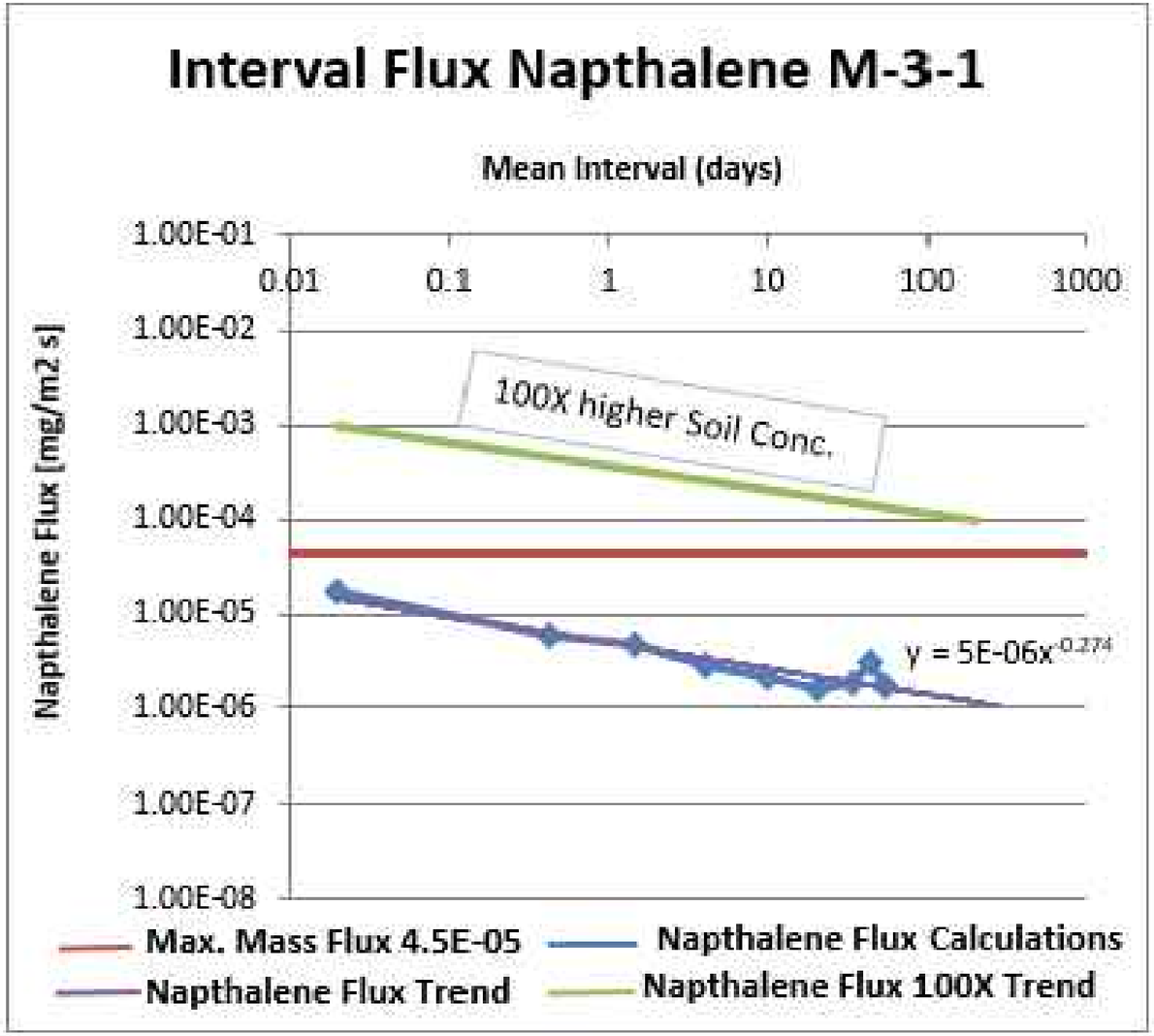


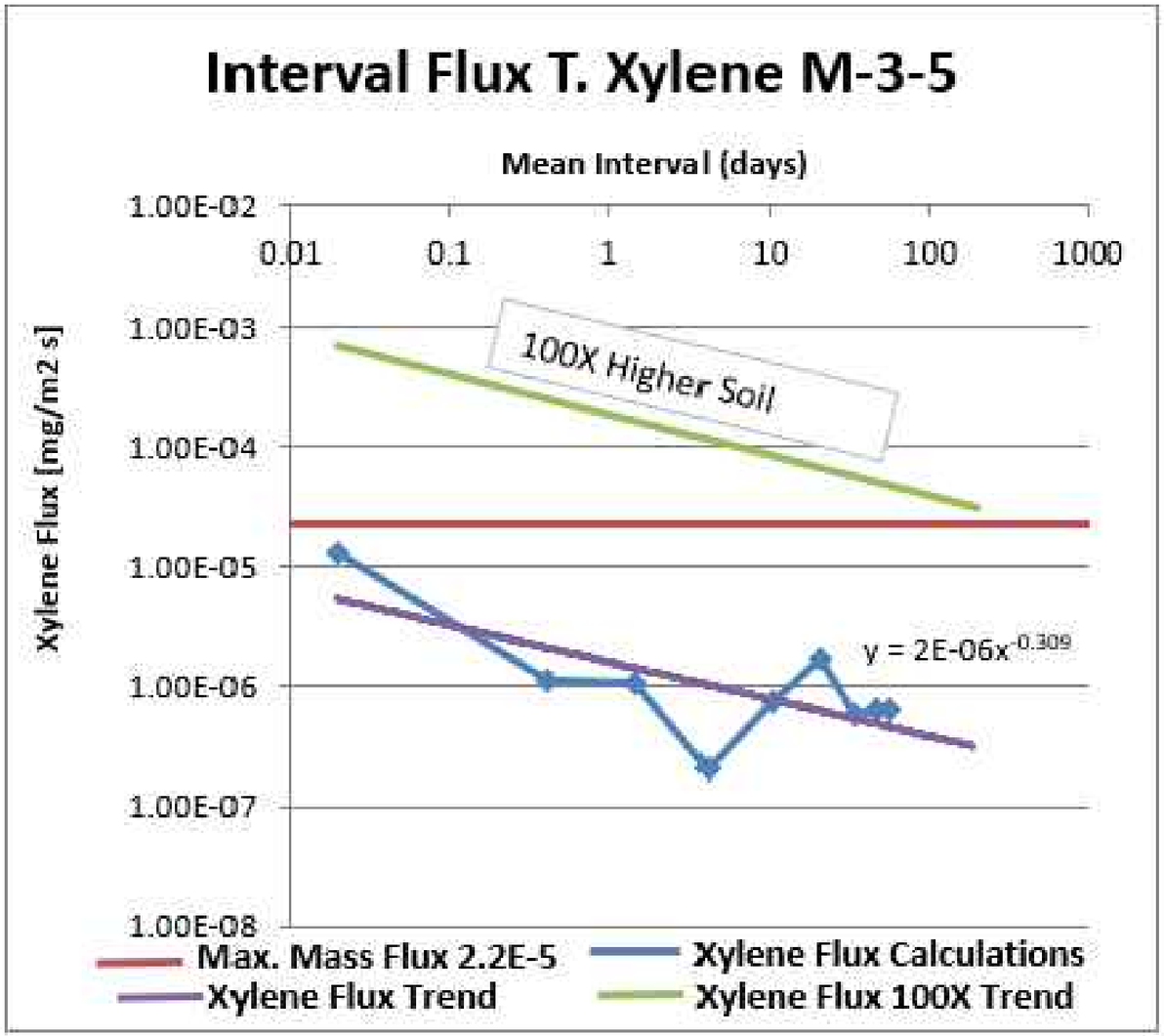
FIGURE A

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SOIL-REAGENT MIX M-3-1 MASS FLEX TRENDING GRAPHS FOR XYLENE AND NAPTHALENE

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: E:\CONED\453097 – WEST 45TH OU-2 SPDI AND TREATABILITY\RDWP ADDENDUM\APPENDIX E – PARSONS MASS FLUX MODELING\453097-RDWP-SK001.DWG
PLOT DATE: 7/21/2023 9:56 AM PLOTTED BY: GOLDTHWAIT, JAMES [NN-US]



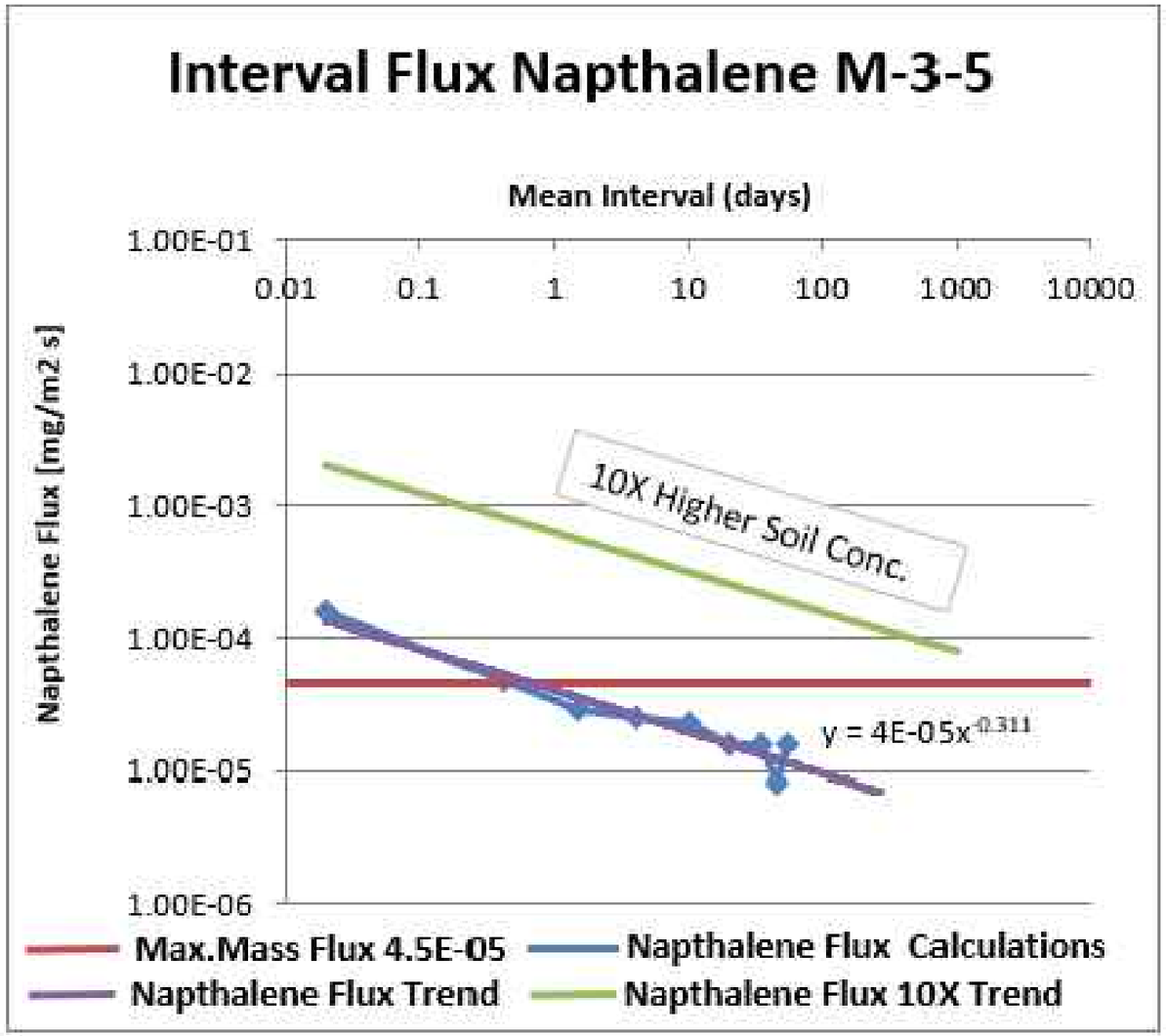


FIGURE B

CONSOLIDATED EDISON OF NEW YORK
FORMER WEST 45th STREET GAS WORKS – OU2
NEW YORK, NEW YORK

SOIL-REAGENT MIX M-3-5 MASS FLEX TRENDING GRAPHS FOR XYLENE AND NAPTHALENE

PARSONS
200 COTTONTAIL LANE, SOMERSET, N.J. 08873, PHONE: 732-537-3500

FILE NAME: E:\CONED\453097 – WEST 45TH OU-2 SPDI AND TREATABILITY\RDWP ADDENDUM\APPENDIX E – PARSONS MASS FLUX MODELING\453097-RDWP-SK001.DWG
PLOT DATE: 7/21/2023 10:27 AM PLOTTED BY: GOLDTHWAIT, JAMES [NN-US]

TECHNICAL MEMORANDUM

Subject: Soil Stabilization Mass Flux Modeling Documentation, West 45th Street Former Manufactured Gas Plant Site, New York City, New York – Supplemental Benzene Modeling

Date: October 22, 2025

A treatability study was completed as a component of the Remedial Design Report (RDR) for the Consolidated Edison Company of New York, Inc. (Con Edison) West 45th Street Former Manufactured Gas Plant (MGP) Site (the Site). The treatability study was completed to identify viable mix ratios to be utilized during implementation of the in-situ stabilization/solidification (ISS) remedy planned to be implemented at the Site.

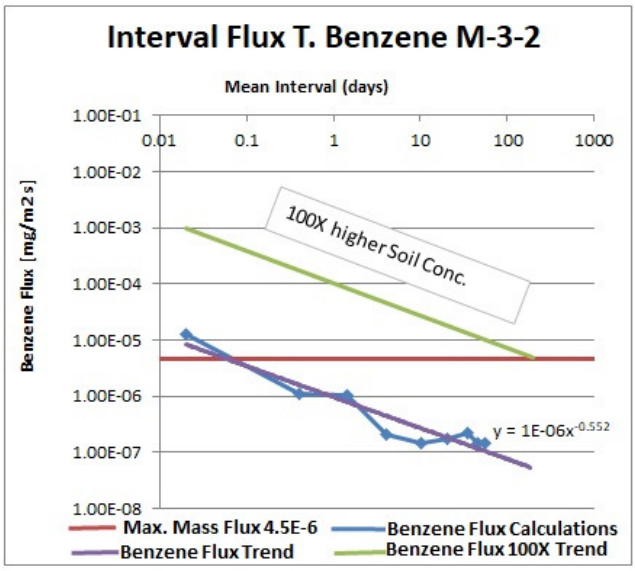
This technical memorandum provides mass flux modeling results for benzene in response to inquiries received from the New York State Department of Environmental Conservation (NYSDEC). On July 18, 2025, NYSDEC inquired regarding the presence of benzene in Site soils at concentrations exceeding Resource Conservation and Recovery Act (RCRA) criteria. Initially, mass flux calculations were completed utilizing available xylene and naphthalene data. Mass flux modeling was not originally performed for benzene as Synthetic Precipitation Leaching Procedure (SPLP) detections were below project-specific action levels for groundwater. However, Leaching Environmental Assessment Framework (LEAF) 1315 (mass flux) testing performed includes results for benzene, therefore modeling efforts have been amended to include benzene.

The modeling demonstrates the inherent properties of ISS to stabilize contaminates in a cement matrix and continually reduce diffusion over time. Modeling was performed according to guidance outlined in the Interstate Technology and Regulatory Council (ITRC) Development of Performance Specifications for Solidification/Stabilization, July 2011, using the Environmental Protection Agency (EPA) 1315 LEAF method for mass flux modeling (EPA 1315, January 2013). The log-log plots for benzene for M-3-2 and M-3-5 (**Figure A**) generated based on the mass flux calculations demonstrate that the slopes of the mass flux over time are negative. This indicates that mass flux, or the proportion of dissolved phase benzene originating from the ISS formation and entering groundwater, will continue to decrease over time.

Following the ITRC guidance, the maximum mass flux (red lines) was established, by applying a conservate dilution attenuation factor to the Site groundwater standards to calculate a maximum allowable contamination level in groundwater. By demonstrating the mass flux is below the maximum mass flux, groundwater flowing around the ISS stabilized footprint will achieve groundwater standards at the compliance point. For soil-reagent mixes M-3-2 and M-3-5 shown in **Figure A,** the benzene mass flux trend lines (purple lines) very quickly drop below the maximum mass flux (red line) that ensures that groundwater will remain below project-specific action levels at the Hudson River.

According to Crank, Mathematics of Diffusion, Oxford University Press, London, 1986, the initial mass flux trend is proportional to the initial contaminate concentration in the monolith. Therefore, it is appropriate for modeling purposes to demonstrate that where soil is stabilized having higher concentrations of Site contaminates, the inherent properties of the stabilized soil will inhibit and ultimately reduce the mass flux to Site groundwater and will continue to decrease over time. **Figure A** also presents the benzene mass flux 100X trend lines for M-3-2 and M-3-5 mixes. These lines assume the initial mass flux concentration is two orders of magnitude higher than the mixes. They are represented by the parallel green lines. The higher concentration parallel lines cross the maximum contaminant flux (red line) after approximately 100 days. The results are comparable to previous xylene and naphthalene mass flux modeling results for soil-reagent mixes M-3-1 and M-3-5 included in **Figure B**, which were originally presented in the mass flux modeling that was included in Appendix E of the Remedial Design Work Plan Summary Report approved by the NYSDEC in a letter and email dated September 5, 2024. The results demonstrate that the inherent properties of the stabilized soil will inhibit mass flux to Site groundwater, and will continue to decrease over time.

FIGURE A



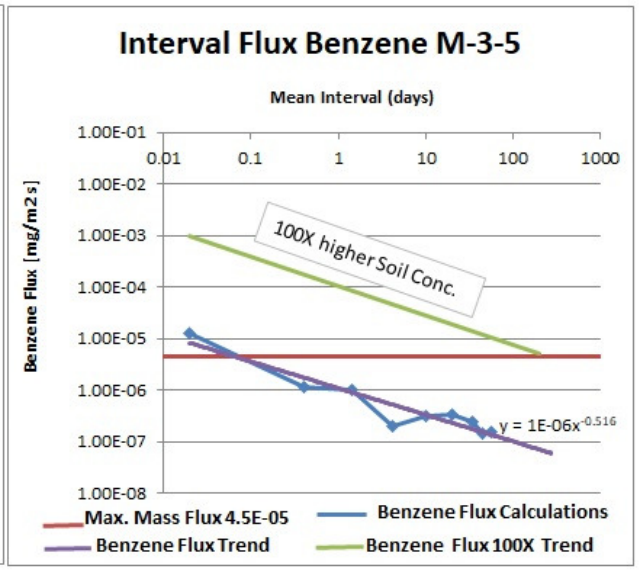
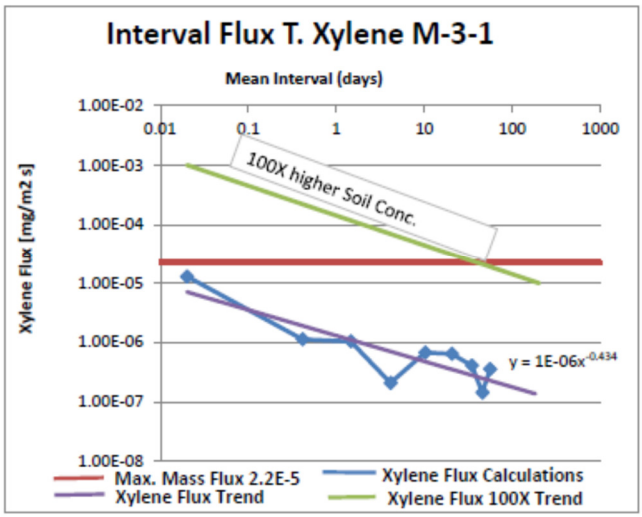
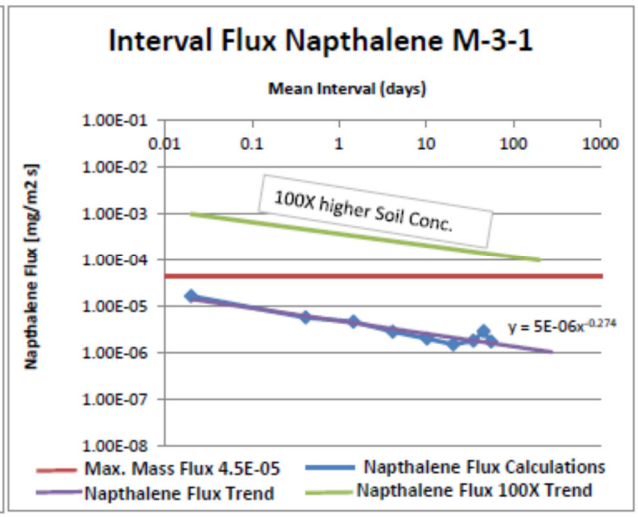
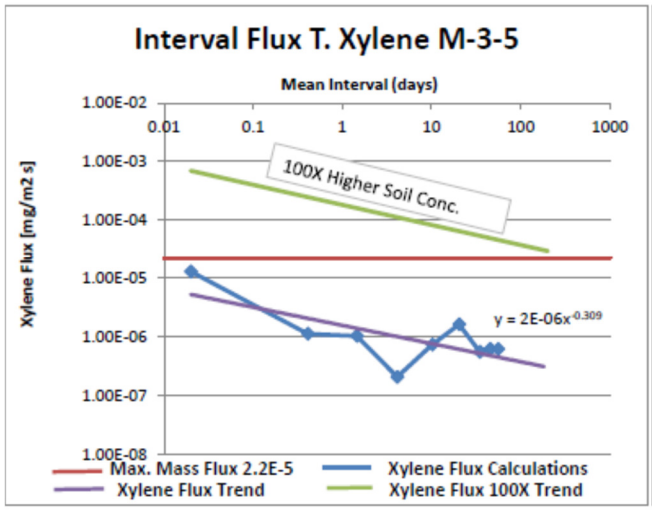
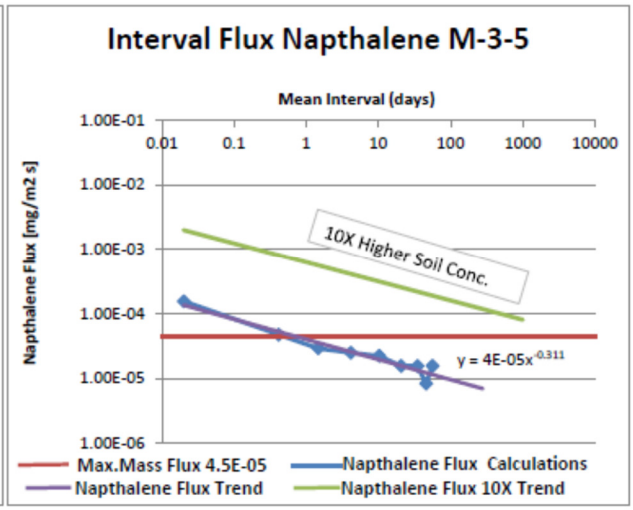


FIGURE B



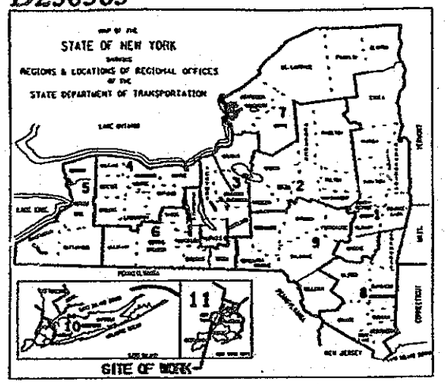






APPENDIX F
INTREPID PEDESTRIAN BRIDGE RECORD DRAWINGS

D258583



PROJECT LOCATION

THIS PROJECT IS LOCATED ALONG NEW YORK STATE ROUTE 9A AT 46TH STREET ALONG THE WEST SIDE OF MANHATTAN IN NEW YORK COUNTY. THE LENGTH OF THE PROPOSED BRIDGE IS APPROXIMATELY 87 METERS.

CONTRACTOR'S NAME Yonkers Contracting Corp
AWARD DATE 5-22-01
COMPLETION DATE 12-30-03
FINAL ACCEPTANCE DATE 6/16/04
REGIONAL DIRECTOR Mr. Douglas Currey
ENGINEER IN CHARGE Pankaj G. Patel
FINAL COST TOTAL $11,428,065.49

FISCAL SHARE	COST(S)
1	$10,928,065.49
2	$ 500,000.00

INDEX ON DWG. NO. I-1.

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
OFFICE OF ENGINEERING

CONSTRUCTION OF INTREPID PEDESTRIAN BRIDGE OVER ROUTE 9A IN THE CITY OF NEW YORK

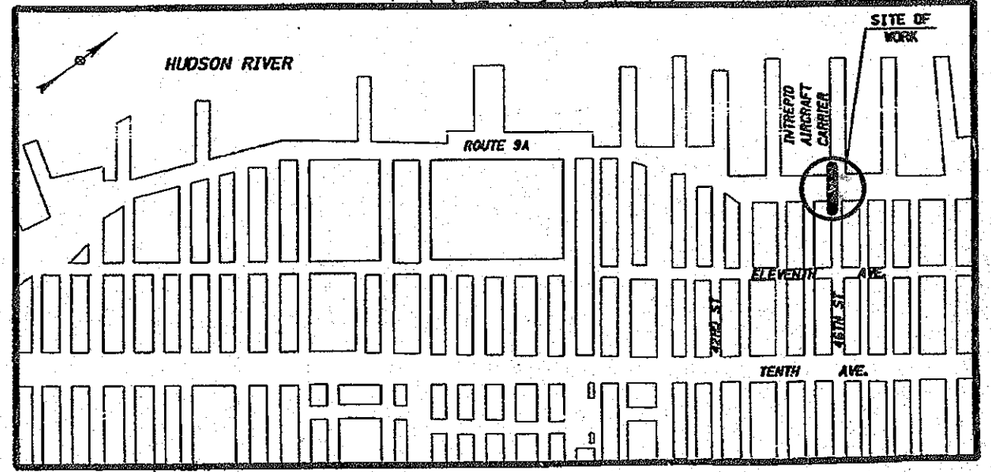
146 SHEETS

CONTRACT D258583

NEW YORK COUNTY

F.A. PROJECT Q05-X024-222

RECORD PLANS



LOCATION MAP

D258583

PROJECT DESCRIPTION
STEEL BOX BEAM PEDESTRIAN BRIDGE WITH CABLE STAYED MAIN SPAN, BUS LAYOVER AREA WITH LANDSCAPING AND LIGHTING

STANDARD SHEETS
M502-1, M502-2R1,M608-3, M609-3, M619-3R1, M619-4, M619-5
M645-50 THROUGH M645-80

ALL WORK CONTEMPLATED UNDER THIS CONTRACT IS TO BE COVERED BY AND IN CONFORMITY WITH THE STANDARD SPECIFICATIONS (METRIC UNITS) OF JANUARY 2, 1995, AS AMENDED BY ADDENDA NOS.1 AND 2, EXCEPT AS MODIFIED ON THESE PLANS AND IN THE ITEMIZED PROPOSAL.

WHEREVER ON THESE PLANS OR IN THE PROPOSAL THE "OLD ITEMS" LISTED BELOW APPEAR THE "NEW ITEMS" SHALL APPLY.

OLD ITEM	NEW ITEM
207.01M	207.10M
207.02M	207.11M
17304.101194M	17304.101199M

NEW YORK CITY MAINTENANCE NOTE

WORK DONE UNDER THIS CONTRACT WHEN COMPLETED, WILL BE MAINTAINED BY THE CITY OF NEW YORK IN ACCORDANCE WITH THE HIGHWAY LAW BY ARTICLE 12, SECTION 340B, IF INTERSTATE, AND BY ARTICLE 12B, SECTION 349C, IF ARTERIAL.
ALL EXISTING SANITARY AND OTHER SEWERS NOT DEEMED TO BE PART OF THE PROJECT BY THE COMMISIONER, WATER MAINS, HYDRANTS AND OTHER MUNICIPALLY OR PRIVATELY-OWNED FACILITIES WITHIN THE LIMITS OF THE R.O.W. WHICH REMAIN IN SERVICE UNCHANGED AND ALL SUCH FACILITIES RELOCATED OR PROTECTED AS PART OF THE WORK PERFORMED UNDER THE PROJECT WHETHER CROSSING, LOCATED WITHIN OR ADJACENT TO THE R.O.W., SHALL BE MAINTAINED AS THE CASE MAY BE BY THE MUNICIPALITY OR BY THE AGENCY OR UNIT HAVING CONTROL OR JURISDICTION THEREOF AT NO COST OR EXPENSE TO THE STATE.
APPROVED PURSUANT TO THE PROVISIONS OF ARTICLE 12B, SECTION 349C OF THE HIGHWAY LAW BY THE MAYOR OF THE CITY OF NEW YORK. MAINTENANCE JURISDICTIONS ARE SHOWN ON DWG. NO. MJP-1
DATE _____
CERTIFICATE NO. _____

APPROVED BY
IRIS WEINSHALL DATE
COMMISSIONER
DEPARTMENT OF TRANSPORTATION, N.Y.C

CHANGES MADE TO THESE PLANS AND RELATED CONTRACT DOCUMENTS SINCE COMPLETION BY THE CONSULTING ENGINEER MAY BE DETERMINED BY COMPARISON WITH SUCH PREFINAL PLANS AND RELATED DOCUMENTS FILED AT THE REGIONAL OFFICE OR THOSE FILED AT THE OFFICE OF THE CONSULTING ENGINEER.

APPROVED BY
HENRY PERAHIA, P.E. DATE
CHIEF ENGINEER
DEPARTMENT OF TRANSPORTATION, N.Y.C

RECOMMENDED BY
WILLIAM HIRSCH, A.I.C.P. DATE
ASSISTANT COMMISSIONER
OFFICE OF CONSTRUCTION COORDINATION
DEPARTMENT OF TRANSPORTATION, N.Y.C

APPROVED BY: Douglas Currey 4/5/01
DOUGLAS CURREY, P.E. DATE
REGIONAL DIRECTOR
N.Y.S.D.O.T. REGION 11

APPROVED BY: 12/19/00
SUBIMAL CHAKRABORTI, P.E. DATE
DEPUTY REGIONAL DIRECTOR

PLANS PREPARED BY EARTH TECH
Nicholas Spaventa 12/18/00
NICHOLAS SPAVENTA, P.E. DATE
NYSPE NO. 57595

RECOMMENDED BY: 12/19/00
JEFFREY RUBIN, P.E. DATE
FOR DIRECTOR OF CONSTRUCTION

RECOMMENDED BY: 12/18/00
SONIA RIVERA, P.E. DATE
DIRECTOR OF OPERATIONS

RECOMMENDED BY: 12/18/00
NORIK TATEVOSSIAN, P.E. DATE
DIRECTOR OF STRUCTURES

APPROVED BY: 12/18/00
ALBERT JASKOWSKY, P.E. DATE
REGIONAL DESIGN ENGINEER

ROUTE 9A RECONSTRUCTION SEGMENT 1			
INTREPID PEDESTRIAN BRIDGE			
NEW YORK COUNTY, NEW YORK			
NO AS-BUILT REVISION			
FED. ROAD REG. NO.	STATE	SHEET NO.	TOTAL SHEETS
1	N.Y.	1 R1	142
FEDERAL AID PROJECT NO.	Q05-X024-222		
CAPITAL PROJECT IDENTIFICATION NO.	X024.22.321		

D258583

DESIGNED BY: J.B/J.D/R.H/J.M. CHECKED BY: J.D/J.M/A.R/S. ESTIMATED BY: A.K. DRAFTED BY: P.D/R.L. CHECKED BY: J.M. CHECKED BY: N.S. IN CHARGE OF:

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	2	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

SHEET NO.	DWG NO.	DESCRIPTION
		GENERAL
1	T-1	TITLE SHEET
2	I-1	INDEX OF DRAWINGS
3	LA-1	LEGEND AND ABBREVIATIONS
4-4A2	EST-1-EST3	ESTIMATE OF QUANTITIES
5	G-1	GENERAL NOTES - 1
6	G-2	GENERAL NOTES - 2
7	G-3	GENERAL NOTES - 3
8	MJP-1	MAINTENANCE JURISDICTION PLAN AND TABLE
9	ECS-1	EROSION AND SEDIMENT CONTROL DETAILS
		MAINTENANCE AND PROTECTION OF TRAFFIC PLANS AND DETAILS
10	M-1	MAINTENANCE AND PROTECTION OF TRAFFIC NOTES AND LEGEND
11	M-2	MAINTENANCE AND PROTECTION OF TRAFFIC LANE CLOSURE DETAIL - SCHEME 1
12	M-3	MAINTENANCE AND PROTECTION OF TRAFFIC LANE CLOSURE DETAIL - SCHEMES 2A & 2B
13	M-4	MAINTENANCE AND PROTECTION OF TRAFFIC ROUTE 9A LANE CLOSURE DETAILS- SCHEMES 3 &4
14	M-5	MAINTENANCE AND PROTECTION OF TRAFFIC TEMPORARY SIGN DATA SHEET
15	M-6	CONSTRUCTION STAGING/SUGGESTED CONSTRUCTION SEQUENCE PLAN
16	M-7	CONSTRUCTION STAGING/SUGGESTED CONSTRUCTION SEQUENCE PLAN
17	M-8	MAIN SPAN - SUGGESTED ERECTION STAGING
18	M-9	TEMPORARY STAGING AREA AT INTREPID MUSEUM
		MISCELLANEOUS TABLES AND DETAILS
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80	BL-3	BAR LIST - PIER 5
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113	TD-32	STORM DRAINAGE DETAILS EAST TOUCHDOWN
114	TD-33	TILED RAMP WALL DEVELOPED ELEVATIONS
		BUS LAYOVER AREA AT 46TH STREET
115	BLA-1	GENERAL PLAN - BUS LAYOVER AREA AT 46TH STREET
116	BLA-2	DEMOLITION PLAN - BUS LAYOVER AREA AT 46TH STREET
117	BLA-3	GRADING AND DRAINAGE PLAN - BUS LAYOVER AREA AT 46TH STREET
118	BLA-4	STREET LIGHTING PLAN - BUS LAYOVER AREA AT 46TH STREET
119	BLA-5	IRRIGATION PLAN - BUS LAYOVER AREA AT 46TH STREET
120	BLA-6	DRAINAGE DETAILS 1 - BUS LAYOVER AREA AT 46TH STREET
121	BLA-7	DRAINAGE DETAILS 2 - BUS LAYOVER AREA AT 46TH STREET
122	BLA-8	DRAINAGE DETAILS 3 - BUS LAYOVER AREA AT 46TH STREET
123	BLA-9	MISCELLANEOUS DETAILS 1 - BUS LAYOVER AREA AT 46TH STREET
124	BLA-10	MISCELLANEOUS DETAILS 2 - BUS LAYOVER AREA AT 46TH STREET
125	BLA-11	MISCELLANEOUS DETAILS 3 - BUS LAYOVER AREA AT 46TH STREET
126	BLA-12	MISCELLANEOUS DETAILS 4 - BUS LAYOVER AREA AT 46TH STREET
127	BLA-13	MISCELLANEOUS DETAILS 5 - BUS LAYOVER AREA AT 46TH STREET
128	BLA-14	MISCELLANEOUS DETAILS 6 - BUS LAYOVER AREA AT 46TH STREET
129	BLA-15	IRRIGATION DETAILS 1 - BUS LAYOVER AREA AT 46TH STREET
130	BLA-16	IRRIGATION DETAILS 2 - BUS LAYOVER AREA AT 46TH STREET
131	BLA-17	IRRIGATION DETAILS 3 - BUS LAYOVER AREA AT 46TH STREET
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133	BLA-19	DRAINAGE AND LIGHTING TABLES - BUS LAYOVER AREA AT 46TH STREET
134	BLA-20	STORM DRAIN PROFILES - BUS LAYOVER AREA AT 46TH STREET
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139	P-2	PLANTING DETAILS BUS LAYOVER AREA AT 46TH STREET
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DRAFTED BY: J.M.L.
CHECKED BY: R.L.L.
DESIGNED BY: N.S.
ESTIMATED BY:
CHECKED BY:
IN CHARGE OF:

J:\WATER\2278\2278822\C\DOCUMENTS\REPID-BRIDGE\PSAE\V_INDEX_N1B
12/20/2000 14:46:42
D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT

AS-BUILT REVISIONS

SIGNATURE DATE

INDEX OF DRAWINGS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTHTECH
I-1	DEC. 2000	NONE	

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	3	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

LEGEND

FEATURE	SYMBOL-PROPOSED	SYMBOL-EXISTING
ROADS		
PAVED ROAD, SHLD. DRT OR PARK LOT		
UNPAVED ROAD, SHLD DRY OR PARK LOT		
SIDEWALK	NEW SW	EXISTING SW
DRIVEWAY		
CURB	NEW CURB	EXISTING CURB
EXISTING TO BE REMOVED		
LIMIT OF NEW FULL DEPTH CONC PAVT		
GUIDE RAIL OR BARRIER		
BOX BEAM OR "W" BEAM GUIDE RAIL	PROP.	EXISTING
BOX BEAM OR "W" BEAM WALL RAIL		
PIPE RAIL FENCE	PROP.	
CONCRETE BARRIER		CONC. BARR.
RETAINING WALL	RW	RW
FENCE		
LOW PROFILE CONCRETE BARRIER		
PORTABLE PRECAST CONCRETE BARRIER		
DRAINAGE FEATURES		
CATCH BASIN STANDARD	CB	CB
CATCH BASIN SPECIAL TYPES		
MANHOLE		S
STORM DRAIN	ST	ST
SANITARY SEWER	SA	SA
COMBINED SEWER	CS	CS
UNDERDRAIN (W/ FLOW DIRECTION)		
WATER LOCATIONS		
PHYSICAL BULKHEAD		
PLATFORM OVER WATER		
MAINTENANCE OF TRAFFIC		
TRAFFIC DIRECTION		
TRAFFIC SUBJECT TO LANE CLOSURE		
TEMP. INERTIAL BARRIER MODULE		
BARRICADE		
PLASTIC BARREL		
CONICAL CORE		
WORK ZONE		
PORTABLE FLASHING ARROW BOARD		
FLAGGER		
CONSTRUCTION SIGN LOCATION & TEXT		
CONSTRUCTION SIGN		
TEMPORARY CONCRETE BARRIER		
SHADOW VEHICLE		
WORK ZONE ACCESS/EGRESS	ACCESS	
TEMP. LIGHTING	T	

LEGEND

FEATURE	SYMBOL-PROPOSED	SYMBOL-EXISTING
SURVEYING DATA		
SPOT ELEVATION	× 1.753	× (1.753)
WATER ELEVATION		WE 102.5
BENCH MARK		BM 12 x
TRANSIT POINT		△
PERMANENT SURVEY MARKER	◉	Ⓐ
NORTH ARROW (TRUE)		
BASELINE		
CENTERLINE		
BUILDING AND SPECIAL SITES		
BUILDINGS IN GENERAL		BLDG.
BUILDINGS TO BE DEMOLISHED		
FOUNDATIONS (FOOTINGS)		FND.
RUINS		RUINS
BUILDING AWNINGS		AWNING
EXTERIOR BUILDING STAIRS		
BOUNDARIES		
PROPERTY LINE		
ROW LINE & MON	MON. R.O.W.	MON. R.O.W.
ACCESS LINE	R.O.W. W/O A R.O.W. W/A	R.O.W. W/O A R.O.W. W/A
ACQUISITION INFO	M-1 M-2 TYPE	M P TYPE
TREES AND BRUSH		
SHRUBS OR GROUNDCOVER		
TREES, DECIDUOUS	(AS)	OR
TREES, CONIFEROUS	(PN)	
PAVEMENT MARKINGS		
CROSSWALK	1	IDENTIFY
STOP LINE	2	IDENTIFY
ISLAND CHANNELIZING LINE AND HATCH LINE	3	IDENTIFY
ISLAND DOUBLE LINE AND HATCH LINE		IDENTIFY
PAVEMENT LEGEND	4 5	IDENTIFY
FULL BARRIER LINE		IDENTIFY
BROKEN LINE		
SINGLE PAVEMENT ARROW	6 7	IDENTIFY
DOUBLE PAVEMENT ARROW	8	IDENTIFY

LEGEND

FEATURE	SYMBOL-PROPOSED	SYMBOL-EXISTING
UTILITY FACILITIES UG = UNDERGROUND OH = OVERHEAD		
ELECTRIC	E	E
TELEPHONE	T	T
CABLEVISION	CV	CV
GAS	G	G
WATER MAIN	W	W
2" TRAFFIC SIGNAL CONDUIT		
3" MANHATTAN COMPUTERIZATION SYSTEM (MSC) CONDUIT	MSC	
CONDUIT FOR FUTURE INTELLIGENT TRANSPORTATION SYSTEM	ITS	
PICK UP EXISTING CONDUIT (PUE.C)		
LOOP DETECTOR		
UTILITY POLE		
FIRE HYDRANT		
PULLBOX STREET LIGHTS		
PULLBOX TRAFFIC SIGNALS		
PULLBOX ITS		
STREET LIGHT		
TRAFFIC SIGNAL (POST MOUNTED)		
TRAFFIC SIGNAL (MAST ARM)		
PEDESTRIAN SIGNAL		
SIGNAL POLE W/ CONTROLLER		
POLICE OR FIRE CALL BOX	ERS	ERS
MANHOLE - UTILITY (IDENTIFIED)		
MANHOLE - UTILITY (IDENTIFIED)		
GAS VALVE, STREET		
GAS VALVE, SDWLK		
WATER VALVE		
REDUCER		
REMOVED		
ABANDONED		
UTILITY LINE TO BE CAPPED		
PHONE		
SIGNS		
SIGNS, GROUND MTD		
PROPOSED SIGN LOCATION & TEXT		LOCATION NO. TEXT NO.
SIGNS, OVERHEAD		
STREET SIGN		
SIGN RELOCATION LOCATION & TEXT		LOCATION NO. TEXT NO.
EXIST. SIGNS TO BE REMOVED & LOC.*		
MISCELLANEOUS		
MAILBOX		MB
WESTSIDE HIGHWAY FOOTINGS		
GRANITE COBBLE PAVEMENT		
CONTOURS	1.7	1.7

ABBREVIATIONS

A	AREA
ABUT	ABUTMENT
AC	ASPHALT CONCRETE
AG	ABOVE GROUND
AH	AHEAD
AOBE	AS ORDERED BY ENGINEER
APPROX	APPROXIMATE
ASPH	ASPHALT
AVE	AVENUE
AVG	AVERAGE
AZ	AZIMUTH
℄	BASELINE
BAR	BARRIER
BC	BOTTOM OF CURB
BDY	BOUNDARY
BEC	BURROW OF ELEC. CONTROL
BG&E	BUREAU OF GAS OR ELEC.
BIN	BRIDGE IDENTIFICATION NUMBER
BIT	BITUMINOUS
BITMAC	BITUMINOUS MACADAM
BK	BACK
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BO	BOTTOM OF OPENING
BPM	BOROUGH PRESIDENT OF MANHATTAN
BR	BRIDGE
BRG	BEARING
BRK	BRICK
℄	CENTERLINE
CA	CELLAR ACCESS
CB	CATCH BASIN
CBL	CABLE
C-C	CENTER TO CENTER
CC	CENTER OF CURVE
CI	CURB INLET
CIP	CAST IRON PIPE
CIP	CAST IN PLACE
CL	CLEARANCE
CM	CUBIC METER
CMP	CORRUGATED METAL PIPE
COMM	COMMERCIAL
CONC	CONCRETE
CON ED	CONSOLIDATED EDISON CO.
CONST	CONSTRUCTION
CONT	CONTROLLER
CORR	CORRUGATED
CP	CONCRETE PIPE, CORNER PLATE
CSP	CORRUGATED STEEL PIPE
CSPA	CORR STEEL PIPE ARCH
CRW	CONC RETAINING WALL
CTR	CENTER
CULV	CULVERT
Δ	DELTA
D	DITCH
DB	BUILDING TO BE DEMOLISHED
DBL	DOUBLE
DC	DROP CURB
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DOC	DEGREE OF CURVE
DP	DISTRIBUTION PRECAST CONC. DUCT
DR-	DRAINAGE NUMBER
DWG	DRAWING
DWY	DRIVEWAY
e MAX	RATE OF SUPERELEVATION
E	EAST, ELECTRIC
EA	EACH
EB	EASTBOUND
EC	END OF CURB
ECS	EMPIRE CITY SUBWAY CO.
EG	EXISTING GROUND
EHW	EXTREME HIGH WATER
ELEV,EL	ELEVATION
ELW	EXTREME LOW WATER
E MAX	MAXIMUM SUPERELEVATION
EMB	EMBANKMENT
ENT	ENTRANCE
EP	EDGE OF PAVEMENT
EQ	EQUALITY
EQUIV	EQUIVALENT
ES	END SECTION
ES	EDGE OF SHOULDER
EST	ESTIMATE
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERNAL
F	FENCE
FB	FULL BANK
FI	FIELD INLET
FL	FENCE LINE
FLS	FIXED LUMP SUM
FD	FOUNDATION
FO	FIBER OPTICS
FP	FULLY PAVED
FP	FLAG POLE, FENCE POST
XING	CROSSING
FR	FRAME
FTG	FOOTING
G	GAS
GA	GAUGE
GALV	GALVANIZED
GAR	GARAGE
GP	GUY POLE
GP	GUIDE POST
GR	GUIDE RAIL
GR	GRAVEL
GRD	GROUND
GR MTD	GROUND MOUNTED
GSB	GAS SERVICE BOX (HOUSE LINE)
GV	GAS VALVE (MAIN LINE)
H	HEIGHT
HCL	HORIZONTAL CONTROL LINE
HI	HEIGHT OF INSTRUMENT
HO	HOUSE
HORIZ	HORIZONTAL
HP	HIGH PRESSURE
HPFS	HIGH PRESSURE FIRE SERVICE
HSD	HEADLIGHT SIGHT DISTANCE
HW	HEADWALL
HWY	HIGHWAY
HYD	HYDRANT
IND	INDUSTRIAL
INV	INVERT
ITS	INTELLIGENT TRANSPORTATION SYS
L	LENGTH
L	LENGTH OF HORIZONTAL CURVE
LNG	LIQUID NATURAL GAS
LONG	LONGITUDINAL
LP	LIGHT POLE
LP	LOW PRESSURE
LPW	LOW PRESSURE WATER MAIN
LPCB	LOW PROFILE CONC. BARRIER
LS	LUMP SUM
LT	LEFT
LVC	LENGTH OF VERTICAL CURVE
M	MAINLINE
M	MEASURED DISTANCE, MAP, MAPLE
m	METER
mm	MILLIMETER
MAS	MASONRY
MAX	MAXIMUM
MB	MAILBOX
MD	MIDDLE ORDINATE OF VER CURVE
MED	MEDIAN
MET	METAL
MH	MANHOLE
MHW	MEAN HIGH WATER
MIN	MINIMUM
MPH	MILES PER HOUR
MON	MONUMENT
MCS	MANHATTAN COMPUTERIZATION SYS
MULTI	MULTIPLE
MUTCD	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH
NB	NORTH BOUND
NC	NORMAL CROWN
NEC	NECESSARY
NIC	NOT IN CONTRACT
NO. #	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OCMP	OBLATE CORRUGATED METAL PIPE
OD	OUTSIDE DIAMETER
OS	ORIGINAL SURFACE
OH	OVERHEAD
OHW	ORDINARY HIGH WATER
OLW	ORDINARY LOW WATER
OP	OPTIONAL
ℙ	PROPERTY LINE
P	PIPE, PARCEL
PET	PETROLEUM
PA	PIPE ARCH
P	PARCEL
PAV'T	PAVEMENT
PAYT	PAYMENT
PB	PULLBOX
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PE	PERMANENT EASEMENT
PE	POLYETHLENE
PED	PEDESTRIAN
PERF	PERFORATED
PI	PAVED INVERT
PI	POINT OF INTERSECTION
PIN	PROJECT IDENTIFICATION NUMBER
PL	PLATE
POL	POINT ON LINE
POP	POPLAR
POLY	POLYETHYLENE
POR	PORCH
PP	POWER POLE
PROP	PROPOSED
PSD	PASSING SIGHT DISTANCE
PT	POINT OF TANGENT
PT	POINT
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
QUAD	QUADRUPLE
R	RADIUS, RISE
RCP	REINFORCED CONCRETE PIPE
RCSP	ROUND CORR STEEL PIPE
RD	ROAD
REINF	REINFORCED
RELOC	RELOCATION
RESURF	RESURFACING
RM	REFERENCE MARKER
ROW	RIGHT OF WAY
RR	RAILROAD
RT	RIGHT
RTE	ROUTE
RW	RETAINING WALL
S	SOUTH, SIGH
SA	SANITARY SEWER
SB	SOUTH BOUND
SC	SCHEDULE
SECT	SECTION
SERV	BLDG SERVICE
SH	STATE HIGHWAY
SHLDR	SHOULDER
SHT	SHEET
SIG	SIGNAL
SPEC	SPECIAL
SPK	SPIKE
SPR	SPRUCE
SQ	SQUARE
SS	SHOULDER STABILIZATION
SSD	STOPPING SIGHT DISTANCE
ST	STREET
ST	STORM SEWER, STEEL
STD	STANDARD
STA	STATION
STO	STONE
STR	STRUCTURAL
STY	STORY
SV	SEWER VENT
SW	SIDEWALK
T	TAN LENGTH, THICKNESS, TELE
T/A	TEMPORARY ACCESS
TAN	TANGENT
TC	TOP OF CURB
TCB	TEMPORARY CONCRETE BARRIER
TEMP	TEMPORARY
TE	TEMPORARY EASEMENT
TG	TOP OF GRATE
TGL	THEORETICAL GRADE LINE
THEO	THEORETICAL
THW	TOP OF HEADWALL
TL	TREE LINE
TMH	TRAINING MAN HOUR
TO	TEMPORARY OCCUPANCY
TO	TOP OF OPENING
TELP	TELEPHONE POLE
TP	TURNING POINT
TP	
TRANS	TRANSITION
TRIP	TRIPLE
TS	TOP OF SLOPE
TSP	TRAFFIC SIGNAL POLE
TV	CABLE TELEVISION
TW	TWIN, TRACER WIRE
TYP	TYPICAL
UC	UNDER CONSTRUCTION
UG	UNDERGROUND
USC&GS	U.S. COAST & GEODETIC SURVEY
VAR	VARIABLE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VTP	VITRIFIED TILE PIPE
W	WEST, WATER, WIDTH
W/	WITH
W/A	WITH ACCESS
WB	WEST BOUND
W/C	WITH CELLAR
WE	WATER ELEVATION
WMP	WATER METER PIT
W/O	WITHOUT
WO/A	WITHOUT ACCESS
WO/C	WITHOUT CELLAR
WSB	WATER SERVICE BOX
WV	WATER VALVE (MAIN LINE)
WW	WINGWALL, WATERWORKS

ADDITIONAL LEGENDS

MPT LEGEND M-1

METRIC/NOMINAL PIPE SIZE (NPS) EQUIVALENTS

ITEM	DESCRIPTION	NPS (INCH)
11615.6010M	51mm DIA. WATER TAP	2
11615.6030M	CAST IRON VALVE BOX, 133mm DIA.	5.25
11615.6040M	CURB GATE VALVE, 51mm DIA.	2
11615.6062M	STEEL WATER PIPE-CEMENT LINED, 51mm DIA.	2
11615.6070M	WATER MTR W/REMOTE READING DEVICE, 38mm DIA.	1.5
11615.6090M	38mm DIA. BACKFLOW PREVENTER W/CHAMBER	1.5
11615.6091M	GATE VALVE, 51mm DIA.	2
11615.609250M	POLYVINYL CHLORIDE (PVC) PIPE, 32mm DIA.	1.25
11615.6093M	POLYVINYL CHLORIDE (PVC) PIPE, 38mm DIA.	1.5
11651.0105M	FIRE CONDUIT, HOT DIP GALV. ST PIPE (NYC) 51mm	2
11660.0106M	CONDUIT, HOT DIPPED GALV. STEEL, 51mm	2
11660.0108M	CONDUIT, HOT DIPPED GALV. STEEL, 76mm	3
11662.0502M	INSTALL 51mm STEEL ELEC. CONDUIT (CON ED)	2
11662.2003M	INSTALL 76mm POLYETHYLENE GAS MAIN (CON ED)	3
11662.2004M	INSTALL 102mm POLYETHYLENE GAS MAIN (CON ED)	4
11662.2006M	INSTALL 152mm POLYETHYLENE GAS MAIN (CON ED)	6
11662.2008M	INSTALL 203mm POLYETHYLENE GAS MAIN (CON ED)	8
11662.2012M	INSTALL 305mm POLYETHYLENE GAS MAIN (CON ED)	12
11662.37M	INSTALL 152mm MAINLINE VALVE	6
11662.4002M	INSTALL 51mm PLASTIC PIPE (ECS)	2
11662.4004M	INSTALL 102mm PLASTIC PIPE CONDUIT (ECS)	4
11662.4102M	INSTALL 51mm STEEL PIPE CONDUIT (ECS)	2
11663.010101M	DUCT CAST IRON WATER PIPE, 152mm DIA. (BWS)	6
11663.010201M	DUCT CAST IRON WATER PIPE, 203mm DIA. (BWS)	8
11663.010303M	DUCT CAST IRON WATER PIPE, 305mm DIA. (BWS)	12
11663.010501M	DUCT CAST IRON WATER PIPE, 508mm DIA. (BWS)	20
11663.2806M	INSTALL CI WATER VALVE & BOX 152mm DIA. (BWS)	6
11663.2808M	INSTALL CI WATER VALVE & BOX 203mm DIA. (BWS)	8
11663.2812M	INSTALL CI WATER VALVE & BOX 305mm DIA. (BWS)	12
11663.282002M	508mm DIA. GATEVALVE & BOX (BWS)	20
11663.5010M	203mm ST WTR PIPE, ELBOWS, TEMP. SUPP. (BWS)	8
11663.5012M	305mm ST WTR PIPE, ELBOWS, TEMP. SUPP. (BWS)	12
11663.5020M	508mm ST WTR PIPE, ELBOWS, TEMP. SUPP. (BWS)	20
680.520108M	CONDUIT, METAL STEEL, ZINC COATED 76mm	3
680.520110M	CONDUIT, METAL STEEL, ZINC COATED 102mm	4
680.520506M	CONDUIT, RIGID PLASTIC-CLASS 1, 51mm	2
680.520508M	CONDUIT, RIGID PLASTIC-CLASS 1, 76mm	3
11680.8302M	TRAF. COND, HOT DIPPED, GALV. ST PIPE (NYC) 51mm	2
11663.2808M	TRAF. COND, HOT DIPPED, GALV. ST PIPE (NYC) 76mm	3

AS-BUILT REVISIONS

SIGNATURE DATE

LEGEND AND ABBREVIATIONS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
LA-1	DEC. 2000	NONE	EARTH TECH

J.M. CHECKED BY: R.L. DRAFTED BY: CHECKED BY: ESTIMATED BY: CHECKED BY: DESIGNED BY: N.S. IN CHARGE OF:

JPM1080620
81/2422881
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ESTIMATE OF QUANTITIES

ITEM NUMBER		DESCRIPTION	UNIT	QUANTITY
201.07	M	CLEARING AND GRUBBING	HA	0.70
202.0101	M	DISPOSAL OF BUILDINGS	LS	NEC
202.19	M	REMOVAL OF SUBSTRUCTURES	CM	3000.00
11202.20	M	HANDLING, TRANSPORTATION, AND DISPOSAL OF PETROLEUM CONTAMINATION SOIL	MT	155.00
11202.21	M	SAMPLING AND TESTING OF PETROLEUM CONTAMINATED SOIL	EACH	100.00
11202.30	M	HANDLING, TRANSPORTATION, AND DISPOSAL OF HAZARDOUS SOIL	MT	325.00
11202.32	M	POST EXCAVATION SAMPLING AND TESTING	EACH	5.00
203.02	M	UNCLASSIFIED EXCAVATION AND DISPOSAL	CM	6983.00
203.07	M	SELECT GRANULAR FILL	CM	768.00
203.19	M	CLEANING DRAINAGE STRUCTURES AND MANHOLES	EACH	2.00
203.21	M	SELECT STRUCTURE FILL	CM	464.00
11203.2802	M	HYDRAULIC FILL	CM	30.00
17203.80	M	CONTROLLED LOW STRENGTH MATERIAL	CM	295.00
206.01	M	STRUCTURE EXCAVATION	CM	363.00
206.02	M	TRENCH AND CULVERT EXCAVATION	CM	555.00
10206.0301	M	CONDUIT EXCAVATION AND BACKFILL - (RESTORING TOP SURFACES NOT INCLUDED)	M	343.00
207.10	M	GEOTEXTILE BEDDING	SQM	860.00
207.11	M	GEOTEXTILE SEPARATION	SQM	610.00
209.05	M	HAYBALE/STRAWBALE	M	70.00
11209.11	M	INLET FILTER SEDIMENT CONTROL FOR NEW CATCH BASINS	EACH	6.00
11209.12	M	INLET FILTER SEDIMENT CONTROL FOR EXISTING CATCH BASINS	EACH	12.00
17304.101199	M	SUBBASE COURSE, TYPE 1011-2	CM	1050.00
403.110001	M	ASPHALT CONCRETE-TYPE 1 BASE COURSE	MT	25.00
403.110010	M	PLANT PRODUCTION QUALITY ADJUSTMENT TO 403.110001	FQU	1.00
403.130001	M	ASPHALT CONCRETE - TYPE 3, BINDER COURSE	MT	13.00
403.130010	M	PLANT PRODUCTION QUALITY ADJUSTMENT TO 403.130001 M	FQU	1.00
403.160001	M	ASPHALT CONCRETE-TYPE 6 TOP COURSE	MT	177.00
403.160010	M	PLANT PRODUCTION QUALITY ADJUSTMENT TO 403.160001	FQU	10.00
407.01	M	TACK COAT	L	450.00
490.10	M	PRODUCTION COLD MILLING BITUMINOUS CONCRETE	SQM	1510.00
502.04	M	CEMENT CONCRETE PAVEMENT, REINFORCED,CLASS C	CM	435.00
502.10	M	METAL REINFORCEMENT FOR CONCRETE PAVEMENT-316 WIDE OR GREATER	SQM	2000.00
502.20	M	TRANSVERSE JOINT SUPPORTS (ALL TYPES)	M	465.00
502.43	M	CONSTRUCTING AND SEALING SPECIAL JOINTS	M	80.00
18502.4402	M	SAWING AND SEALING PAVEMENT AND SHOULDER JOINTS IN NEW PORTLAND CEMENT CONCRETE PAVEMENT (6 M AND 19 M SLABS)	M	900.00
503.0101	M	CEMENT CONCRETE FOUNDATION FOR PAVEMENT, UNREINFORCED, CLASS C	CM	21.00
10520.05	M	SAW CUTTING PCC AND COMPOSITE PAVEMENT	M	300.00

ESTIMATE OF QUANTITIES

ITEM NUMBER		DESCRIPTION	UNIT	QUANTITY
552.12	M	TEMPORARY TIMBER SHEETING	SQM	475.00
552.16	M	EXCAVATION PROTECTION SYSTEM	SQM	380.00
555.0104	M	FOOTING CONCRETE CLASS A (NO CONCRETE CLASS SUBSTITUTIONS ALLOWED, EXCEPT AS PERMITTED IN SUBSECTION 555-3.12	CM	251.00
555.0105	M	CONCRETE FOR STRUCTURES, CLASS A	CM	247.00
556.0201	M	UNCOATED BAR REINFORCEMENT FOR CONCRETE STRUCTURES	KG	18370.00
556.0202	M	EPOXY-COATED BAR REINFORCEMENT FOR STRUCTURES	KG	13300.00
556.03	M	STUD SHEAR CONNECTORS FOR BRIDGES	EACH	2289.00
557.01	M	SUPERSTRUCTURE SLAB WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK REQUIRED	SQM	672.00
557.05	M	SUPERSTRUCTURE SLAB WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK NOT REQUIRED	SQM	66.00
18559.1896	M	PROTECTIVE SEALING OF STRUCTURAL CONCRETE ON NEW BRIDGE DECKS AND BRIDGE DECK OVERLAYS	SQM	704.00
11560.2005	M	FROST PROOF EXTERIOR WALL TILE AND SETTING BED	SQM	55.00
564.0501	M	STRUCTURAL STEEL, TYPE 1	LS	NEC
564.0502	M	STRUCTURAL STEEL, TYPE 2	LS	NEC
564.0503	M	STRUCTURAL STEEL, TYPE 3	LS	NEC
564.0504	M	STRUCTURAL STEEL, TYPE 4	LS	NEC
11564.99	M	STRUCTURAL STEEL 38 MM DIAMETER BRIDGE STRAND	LS	NEC
565.1521	M	TYPE M.R. EXPANSION BEARING 0 TO 1000 KN	EACH	4.00
565.1721	M	TYPE M.R. FIXED BEARING 0 TO 1000 KN	EACH	2.00
565.2031	M	TYPE E.B EXPANSION BEARING 0 TO 250 KN	EACH	16.00
566.01	M	MODULAR EXPANSION JOINT SYSTEM - ONE CELL	M	21.00
567.36	M	ARMORED JOINT SYSTEM WITH COMPRESSION SEAL - TYPE A6	M	10.00
568.32	M	CEMENT MORTAR PADS	EACH	253.00
572.010001	M	STRUCTURAL STEEL PAINT SYSTEM: SHOP APPLIED	SQM	1480.00
16572.030001	M	SHOP APPLIED STRUCTURAL STEEL PAINT SYSTEM	SQM	105.00
576.01	M	SCUPPERS (TYPE A)	EACH	16.00
576.2001	M	DOWNSPOUT SYSTEM (DUCTILE IRON)	M	100.00
11576.99	M	TRENCH DRAIN	EACH	1.00
586.01	M	DRILLING AND GROUTING BOLTS, OR REINFORCING BARS	MM	237000.0
11599.29	M	ELECTRIC PANEL HOUSE	LS	NEC
11599.30	M	ELECTRIC SERVICE EQUIPMENT	LS	NEC
11603.9512	M	DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 305 MM	M	41.00
11603.9516	M	DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 406 MM DIAMETER (NYC)	M	105.00
11604.0202	M	CATCH BASIN - TYPE 2 (NYC)	M	18.00
11604.0485	M	NYC STANDARD MANHOLE TYPE A-1	M	5.00
11604.0726	M	CONNECTION TO EXISTING DRAINAGE FACILITIES	EACH	2.00
605.1701	M	OPTIONAL UNDERDRAIN PIPE, 100 MILLIMETER DIAMETER	M	80.00

FED ROAD REG. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	4	142

ROUTE 9A RECONSTRUCTION PROJECT
SEGMENT 1
NEW YORK COUNTY
P.I.N. X024.22

AS BUILT REVISIONS

SIGNATURE _____ DATE _____

ESTIMATE OF QUANTITIES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FILENAME	REGION	DATE	DRAWING NO.

ESTIMATE OF QUANTITIES

ITEM NUMBER		DESCRIPTION	UNIT	QUANTITY
11607.21	M	REMOVE AND DISPOSE OF CHAIN LINK FENCE	M	320.00
11607.9902	M	PROTECTIVE SCREENING	M	97.00
11607.9903	M	DECORATIVE FENCE	M	88.00
608.0101	M	CONCRETE SIDEWALKS AND DRIVEWAYS	CM	550.00
608.08	M	GROUTED STONE BLOCK PAVING (SAND SETTING BED)	SQM	21.00
08608.1008	M	RESETTING BRICK, BLOCK OR FLAGSTONE SIDEWALK OR DRIVESAYS	SQM	35.00
11608.15	M	GRANITE MODULAR PAVERS	SQM	100.00
609.0204	M	STONE CURB, GRANITE, (TYPE D)	M	485.00
609.0205	M	STONE CURB, GRANITE, (TYPE E)	M	4.00
11609.0215	M	GRANITE PLANTING BED CURB - STRAIGHT OR RADIALLY CUT	M	175.00
611.010193	M	PLANTING MAJOR DECIDUOUS TREE SPECIES (SEE CONTRACT DOCUMENTS) 100 MM CALIPER BALLED & BURLAPPED	EACH	11.00
611.040114	M	PLANTING DECIDUOUS SHRUB SPECIES (SEE CONTRACT DOCUMENTS) AS SPECIFIED (SEE CONT-DOCUM	EACH	440.00
611.040134	M	PLANTING DECIDUOUS SHRUB SPECIES (SEE CONTRACT DOCUMENTS) 0.50 METER HEIGHT/SPREAD AS SPECIFIED	EACH	1837.00
611.050133	M	PLANTING EVERGREEN SHRUB SPECIES (SEE CONTRACT DOCUMENTS) 0.50 METER HEIGHT/SPREAD AS SPECIFIED	EACH	442.00
11613.0101	M	TOPSOIL, URBAN PLANTING MIX	CM	373.00
615.03	M	WATERING VEGETATION	KL	25.00
11615.6015	M	2 NPS DIAMETER WATER TAP	EACH	1.00
11615.6020	M	QUICK COUPLING VALVE WITH CHAMBER	EACH	3.00
11615.6030	M	CAST IRON VALVE BOX 5.25 NPS DIAMETER	EACH	5.00
11615.6040	M	CURB GATE VALVE 2 NPS DIAMETER	EACH	5.00
11615.6062	M	STEEL WATER PIPE-CEMENT LINED - 2 NPS DIAMETER	M	25.00
11615.6070	M	WATER METER WITH REMOTE READING DEVICE - 1.5 NPS DIAMETER	EACH	1.00
11615.6080	M	PRECAST WATER METER STRUCTURE	EACH	1.00
11615.6090	M	1.5 NPS DIAMETER BACKFLOW PREVENTER WITH CHAMBER	EACH	1.00
11615.6091	M	GATE VALVE 2 NPS DIAMETER	EACH	1.00
11615.609250	M	POLYVINYL (PVC) PIPE, 1.25 NPS DIAMETER	M	5.00
11615.6093	M	POLYVINYL CHLORIDE (PVC) PIPE - 1.5 NPS DIAMETER	M	60.00
11615.6099	M	DECORATIVE RAILING	M	342.00
619.01	M	BASIC MAINTENANCE AND PROTECTION OF TRAFFIC	LS	NEC
619.02	M	CONSTRUCTION SIGNS	LS	NEC
619.0303	M	FLASHING ARROW BOARDS	LS	NEC
619.0413	M	TYPE III CONSTRUCTION BARRICADE	M	140.00
619.0502	M	LIGHTING FOR CONSTRUCTION BARRICADES	M	140.00
619.17	M	TEMPORARY CONCRETE BARRIER	M	75.00
11619.607244	M	TEMPORARY CHAIN LINK FENCING GROUND MOUNTED 2.44 M HIGH	M	56.00
11619.607488	M	TEMPORARY CHAIN LINK FENCE GATE 4.88 M WIDE, 2.44 M HEIGHT	EACH	1.00
15619.6730	M	LIGHTING FOR NIGHTTIME OPERATIONS	LS	NEC

ESTIMATE OF QUANTITIES

ITEM NUMBER		DESCRIPTION	UNIT	QUANTITY
623.12	M	CRUSHED STONE, (IN-PLACE MEASURE)	CM	207.00
625.01	M	SURVEY AND STAKEOUT	LS	NEC
15634.0498	M	2-WAY FM, RADIO BASE STATION	MNTH	21.00
15634.0499	M	2-WAY FM MOBILE RADIOS	MNTH	126.00
10634.1002	M	PORTABLE VARIABLE MESSAGE SIGN - LED ENHANCED DISK MATRIX	EACH	2.00
11634.890008	M	HEALTH AND SAFETY PLAN	LS	NEC
11634.9001	M	RODENT CONTROL - INITIAL SURVEY BAITING AND SANITATION	LS	NEC
11634.9002	M	RODENT CONTROL - MAINTENANCE	MNTH	18.00
11634.9901	M	TENSIONED FABRIC ROOF	LS	NEC
637.03	M	CONCRETE CYLINDER CURING BOX	EACH	1.00
637.0802	M	ENGINEERS OFFICE - TYPE D	MNTH	21.00
11637.20	M	FURNISH PORTABLE CELLULAR TELEPHONE EQUIPMENT	MNTH	84.00
11637.21	M	VOICE MESSAGE UNIT CHARGES FOR CELLULAR TELEPHONE SERVICE	LS	NEC
15637.35	M	MICROCOMPUTER SYSTEM	EACH	1.00
15637.61	M	CRITICAL PATH METHOD (CPM) NETWORK SCHEDULING SYSTEM	LS	NEC
15637.91	M	CHAMP MANAGEMENT SYSTEM	LS	NEC
645.7101	M	GROUND MOUNTED SIGN PANEL, MUTCD CODES R, P, W, AND M, CLASS 1, UP TO 460 MM	SQM	1.00
645.81	M	TYPE A SIGN POST	EACH	2.00
647.06	M	REMOVAL AND STORAGE OF SIGNS - SIZE A (0.0 - 1.0 SQ METERS)	EACH	1.00
655.0101	M	FRAMES AND GRATES (CASTINGS)	SQM	6.00
656.01	M	MISCELLANEOUS METALS	KG	9460.00
11656.2004	M	HANDRAILS AND RAILINGS	M	175.00
11660.0106	M	CONDUIT, HOT DIPPED GALVANIZED STEEL PIPE (BUREAU OF GAS AND ELECTRICITY) 2 NPS	M	450.00
11660.0108	M	CONDUIT, HOT DIPPED GALVANIZED STEEL PIPE BUREAU OF GAS AND ELECTRICITY - 3 NPS	M	20.00
11660.0810	M	CONCRETE SIDEWALK BOX,TYPE 3618 (BUREAU OF GAS AND ELECTRIC)	EACH	11.00
11660.0812	M	CONCRETE SIDEWALK BOX,TYPE 4824 (BUREAU OF GAS AND ELECTRIC)	EACH	1.00
11660.0908	M	CONCRETE ROADWAY BOX, TYPE 2418 (BUREAU OF ELECTRIC CONTROL)	EACH	2.00
11661.0305	M	INSULATED CONDUCTOR, NO. 6 (BUREAU OF ELECTRIC CONTROL)	M	550.00
11661.0306	M	INSULATED CONDUCTOR, NO. 2 (BUREAU OF ELECTRIC CONTROL)	M	970.00
11662.80	M	REMOVAL OF ABANDONED MASONRY (CON EDISON)	CM	25.00
11665.10	M	FURNISH AND INSTALL BOLLARDS	EACH	20.00
670.0111	M	FOUNDATION FOR LIGHT STANDARDS, 1.1 METERS LONG	EACH	13.00
670.0112	M	FOUNDATION FOR LIGHT STANDARDS, 1.2 METERS LONG	EACH	8.00
11670.1080	M	TYPE M LAMPPOST, 7.75 METER MOUNTING HEIGHT - 3.05 METER ARM	EACH	7.00
11670.1501	M	POLE AND POLE MOUNTED LUMINAIRE 175 WATT METAL HALIDE	EACH	1.00
11670.159301	M	TYPE B-12 LAMPPOST	EACH	13.00

FED ROAD REG. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	4A1	142

ROUTE 9A RECONSTRUCTION PROJECT
SEGMENT 1
NEW YORK COUNTY
P.I.N. X024.22

AS BUILT REVISIONS

SIGNATURE DATE

ESTIMATE OF QUANTITIES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FILENAME	REGION	DATE	DRAWING NO.

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		4F1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 4F1, IS A SUPPLEMENT TO SHEET 4.

CHANGE IN BID QUANTITIES FOR FIELD CHANGE SHEET NOS. 4F1, 115F1, 116F1, 117F1, 118F1, 119F1, 124F1, 125F1, 127F1, 128F1, 128F2, 128F3, 129F1, 130F1, 133F1, 133F2, 133F3, 134F1, 135F1, 136F1, 137F1, 138F1, 139F1, 140F1, 141F1, 142F1

ITEM NO.	DESCRIPTION	UNIT	FIELD CHANGE QUANTITY	AUTHORIZED QUANTITY	TOTAL QUANTITY
201.07 M	CLEARING AND GRUBBING	HA	0.13	0.70	0.83
202.19 M	REMOVAL OF SUBSTRUCTURES	CM	279	3000	3,279
203.02 M	UNCLASSIFIED EXCAVATION AND DISPOSAL	CM	1,125	6,983	8,108
203.07 M	SELECT GRANULAR FILL	CM	-494	768	274
206.02 M	TRENCH AND CULVERT EXCAVATION	CM	76	555	631
10206.0301 M	CONDUIT EXCAVATION AND BACKFILL - (RESTORING TOP SURFACES NOT INCLUDED)	M	146	343	489
207.10 M	GEOTEXTILE BEDDING	SQM	-509	860	351
207.11 M	GEOTEXTILE SEPARATION	SQM	73	610	683
11209.11 M	INLET FILTER SEDIMENT CONTROL FOR NEW CATCH BASINS	EACH	2	6	8
17304.101199 M	SUBBASE COURSE, TYPE 1011-2	CM	113	1,050	1,163
502.04 M	CEMENT CONCRETE PAVEMENT, REINFORCED, CLASS C	CM	90	435	525
502.10 M	METAL REINFORCEMENT FOR CONCRETE PAVEMENT - 3M WIDE OR GREATER	SQM	285	2,000	2,285
502.20 M	TRANSVERSE JOINT SUPPORTS (ALL TYPES)	M	178	465	643
502.43 M	CONSTRUCTING AND SEALING SPECIAL JOINTS	M	29	80	109
18502.4402 M	SAWING AND SEALING PAVEMENT AND SHOULDER JOINTS IN NEW PORTLAND CEMENT CONCRETE PAVEMENT (6M AND 19M SLABS)	M	368	900	1,268
555.0105 M	CONCRETE FOR STRUCTURES, CLASS A	CM	-72	247	175
556.0201 M	UNCOATED BAR REINFORCEMENT FOR CONCRETE STRUCTURES	KG	-7,157	18,370	11,213
556.0202 M	EPOXY-COATED BAR REINFORCEMENT FOR STRUCTURES	KG	751	13,300	14,051
11559.9001 M	ANTI-GRAFFITI PROTECTION COATING	SQM	93	0	93
11603.9516 M	DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 406 MM DIAMETER (NYC)	M	15	105	120
11604.0202 M	CATCH BASIN - TYPE 2 (NYC)	M	3	18	21
605.1701 M	OPTIONAL UNDERDRAIN PIPE, 100 MILLIMETER DIAMETER	M	-55	80	25
607.0513 M	VINYL COATED STEEL CHAIN-LINK FENCING ON PLASTIC COATED FRAME WITH TOP RAIL	M	30	0	30
11607.21 M	REMOVE AND DISPOSE OF CHAIN LINK FENCE	M	8	320	328
11607.9903 M	DECORATIVE FENCE	M	-88	88	0
608.0101 M	CONCRETE SIDEWALKS AND DRIVEWAYS	CM	-250	550	300
11608.0196 M	COLOR TINTED CONCRETE PAVING	CM	215	0	215
608.08 M	GROUTED STONE BLOCK PAVED SIDEWALKS AND DRIVEWAYS (SAND SETTING BED)	SQM	16	21	37
24608.50 M	DETECTABLE WARNING SURFACE	SQM	2	0	2
609.0204 M	STONE CURB, GRANITE, (TYPE D)	M	62	485	547
11609.0215 M	GRANITE PLANTING BED CURB - STRAIGHT OR RADIALLY CUT	M	-133	175	42
611.010193 M	PLANTING MAJOR DECIDUOUS TREE SPECIES (SEE CONTRACT DOCUMENTS) 100MM CALIPER BALLED & BURLAPPED	EACH	7	11	18
611.040114 M	PLANTING DECIDUOUS SHRUB SPECIES (SEE CONTRACT DOCUMENTS) AS SPECIFIED	EACH	-190	440	250
611.040134 M	PLANTING DECIDUOUS SHRUB SPECIES (SEE CONTRACT DOCUMENTS) 0.50 METER HEIGHT/SPREAD AS SPECIFIED	EACH	-1,151	1,837	686
611.050133 M	PLANTING EVERGREEN SHRUB SPECIES (SEE CONTRACT DOCUMENTS) 0.50 METER HEIGHT/SPREAD AS SPECIFIED	EACH	-233	442	209
11613.0101 M	TOPSOIL, URBAN PLANTING MIX	CM	-183	373	190
11615.6020 M	QUICK COUPLING VALVE WITH CHAMBER	EACH	-2	3	1
11615.6030 M	CAST IRON VALVE BOX 5.25 NPS DIAMETER	EACH	-1	5	4
11615.6040 M	CURB GATE VALVE 2 NPS DIAMETER	EACH	-1	5	4
11615.609250 M	POLYVINYL CHLORIDE (PVC) PIPE - 1.25 NPS DIAMETER	M	-3	5	2
11615.6093 M	POLYVINYL CHLORIDE (PVC) PIPE - 1.5 NPS DIAMETER	M	-20	60	40
623.12 M	CRUSHED STONE, (IN-PLACE MEASURE)	CM	-34	207	173
625.01 M	SURVEY AND STAKEOUT	LS	1	NEC	1
625.06 M	PERMANENT SURVEY MARKER	EACH	1	0	1
11615.0801 M	TYPE 'A' BENCH (WORLD'S FAIR)	M	20	0	20
655.0101 M	FRAMES AND GRATES (CASTINGS)	SQM	2	6	8
656.01 M	MISCELLANEOUS METALS	KG	152	9,460	9,612
11656.2004 M	HANDRAILS AND RAILINGS	M	7	175	182
11660.0106 M	CONDUIT, HOT DIPPED GALVANIZED STEEL PIPE (BUREAU OF GAS AND ELECTRICITY) 2 NPS	M	221	450	671
11660.0810 M	CONCRETE SIDEWALK BOX, TYPE 3618 (BUREAU OF GAS AND ELECTRIC)	EACH	9	11	20
11661.0305 M	INSULATED CONDUCTOR, NO. 6 (BUREAU OF ELECTRIC CONTROL)	M	123	550	673
11661.0306 M	INSULATED CONDUCTOR, NO. 2 (BUREAU OF ELECTRIC CONTROL)	M	211	970	1,181
11665.10 M	FURNISH AND INSTALL BOLLARDS	EACH	21	20	41
670.0111 M	FOUNDATION FOR LIGHT STANDARDS, 1.1 METERS LONG	EACH	4	13	17
670.0112 M	FOUNDATION FOR LIGHT STANDARDS, 1.2 METERS LONG	EACH	3	8	11
11670.1080 M	TYPE M LAMPPOST, 7.75 METER MOUNTING HEIGHT - 3.05 METER ARM	EACH	2	7	9
11670.159301 M	TYPE 8-12 LAMPPOST	EACH	4	13	17
11670.5110 M	LUMINAIRE, 250 WATT HIGH PRESSURE SODIUM, TEARDROP	EACH	3	7	10
11670.5117 M	100 WATT HPS LUMINAIRE WITH BUILT-IN BALLAST	EACH	4	13	17
685.01 M	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 0.38MM	M	550	350	900
685.04 M	WHITE EPOXY REFLECTORIZED PAVEMENT SYMBOLS - 0.38MM	EACH	2	5	7

APPROVED
DATE: 10.08.02
R. SCHMALZ, P.E.
ROUTE 9A PROJECT DIRECTOR

APPROVED
DATE: 10/10/02
P. SALERNO, P.E.
DIRECTOR OF CONSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
APPROVED DATE: 11-1-02

THIS SIGNATURE IS FOR THE APPROVAL OF THE FOLLOWING SHEETS:

SHEET NOS.

4F1, 115F1, 116F1, 117F1, 118F1, 119F1, 124F1, 125F1, 127F1, 128F1, 128F2, 128F3, 129F1, 130F1, 133F1, 133F2, 133F3, 134F1, 135F1, 136F1, 137F1, 138F1, 139F1, 140F1, 141F1, 142F1

Nicholas Spaventa 10/2/02
NICHOLAS SPAVENTA, P.E. DATE
EARTH TECH

LICENSED PROFESSIONAL ENGINEER NICHOLAS SPAVENTA No. 67907 STATE OF NEW YORK

AS-BUILT REVISIONS

SIGNATURE DATE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
EST-1	AUGUST 2002	NONE	EARTH TECH

DESIGNED BY: AR CHECKED BY: NS
DRAFTED BY: SC/AR/JE CHECKED BY: NS
ESTIMATED BY: JE/AR CHECKED BY: AR
IN CHARGE OF: NS

USER
AUGUST 2002
X024224A.EST

D258583

ESTIMATE OF QUANTITIES

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY
670.2001 M	GALVANIZED STEEL CONDUIT, 3/4 NPS	M	495.00
670.2301 M	GALVANIZED STEEL PLASTIC COATED CONDUIT, 1/2 NPS	M	111.00
670.2501 M	FLEXIBLE CONDUIT, 3/4 NPS	M	46.00
670.2601 M	RIGID PLASTIC CONDUIT, 1 NPS	M	52.00
670.40 M	CAST IRON JUNCTION BOXES	EACH	6.00
11670.5110 M	LUMINAIRE, 250 WATT HIGH PRESSURE SODIUM, TEARDROP	EACH	7.00
11670.5117 M	100 WATT HPS LUMINAIRE WITH BUILT-IN BALLAST	EACH	13.00
11670.5145 M	SURFACE MOUNTED VANDAL RESISTANT LIGHTING FIXTURES	EACH	2.00
11670.5146 M	COLUMN MOUNTED CYLINDER LUMINAIRES	EACH	8.00
11670.5198 M	BOLLARD LUMINAIRE, 100 WATT METAL HALIDE	EACH	31.00
670.60 M	PHOTOELECTRIC CONTROLS	EACH	1.00
11670.6001 M	FURNISH PHOTOELECTRIC CONTROL UNIT (BUREAU OF GAS AND ELECTRICITY)	EACH	3.00
11670.6002 M	INSTALL PHOTOELECTRIC CONTROL UNIT (BUREAU OF GAS AND ELECTRICITY)	EACH	3.00
11670.6401 M	DECORATIVE ARM AND STEM MOUNTED LUMINAIRE, 50 WATT METAL HALIDE	EACH	11.00
670.7006 M	SINGLE CONDUCTOR CABLE, NUMBER 10 GAGE	M	2400.00
670.81 M	REMOVE AND DISPOSE OF LAMPPOST ASSEMBLY	EACH	12.00
670.82 M	REMOVE LAMPPOST FOUNDATION	EACH	13.00
670.90 M	RELOCATE LAMPPOST ASSEMBLY	EACH	1.00
680.520608 M	TRAFFIC SIGNAL CONDUIT, RIGID PLASTIC, CLASS 1, 3 NPS	M	12.00
685.01 M	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 0.38MM	M	350.00
685.04 M	WHITE EPOXY REFLECTORIZED PAVEMENT SYMBOLS - 0.38MM	EACH	5.00
691.0101 M	TRAINING REQUIREMENTS	LS	NEC
697.01 M	INTERIM PAYMENT	LS	NEC
15698.9394 M	INCENTIVE PAYMENTS/DISINCENTIVE ASSESSMENTS FOR WORK SUBJECT TO THE SPECIAL NOTE 'INCENTIVE/ DISINCENTIVE CLAUSE'	LS	NEC
699.040001 M	MOBILIZATION	LS	NEC

ESTIMATE OF QUANTITIES

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY

FED ROAD REC. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	4A2	142

ROUTE 9A RECONSTRUCTION PROJECT
SEGMENT 1
NEW YORK COUNTY
P.I.N. X024.22

AS BUILT REVISIONS

SIGNATURE DATE

ESTIMATE OF QUANTITIES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FILENAME	REGION	DATE	DRAWING NO.

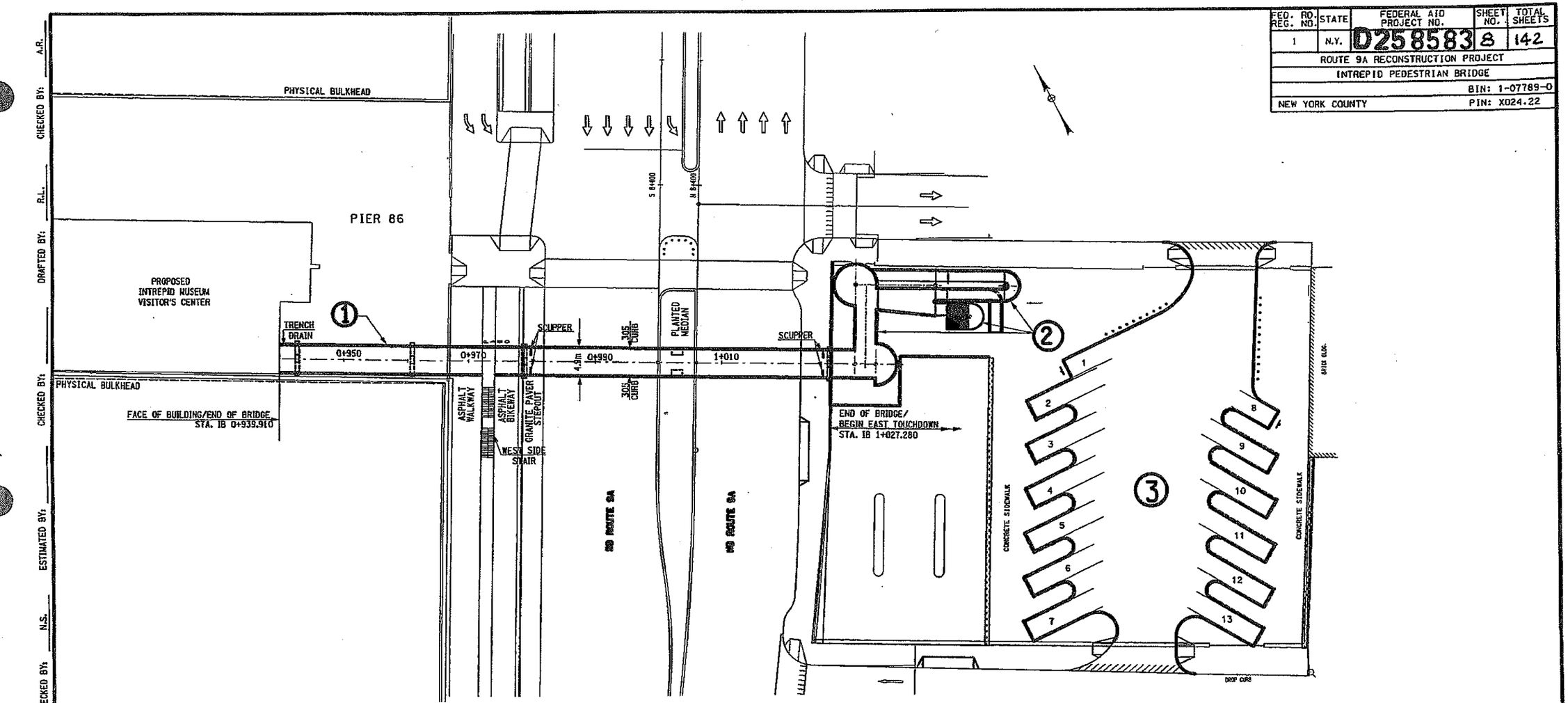
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	8	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



PART NO.	DESCRIPTION	FEATURE(S) TO BE MAINTAINED	LIMITS	MAINTAINING AGENCY	AUTHORITY FOR MAINTENANCE JURISDICTION
1	PEDESTRIAN BRIDGE	ENTIRE STRUCTURE	IB 0+939.91 TO IB 1+027.28	NYSDOT BY CITY OF NY	ARTICLE 12B, SECTION 349C
		SNOW & ICE REMOVAL	IB 0+939.91 TO IB 1+027.28	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		CLEANING	IB 0+939.91 TO IB 1+027.28	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		LIGHTING (INCLUDING MEDIAN ACCENT LIGHTING)	IB 0+939.91 TO IB 1+027.28	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
2	EAST TOUCHDOWN (RAMPS AND STAIRS)	ENTIRE STRUCTURE	-	NYSDOT BY CITY OF NY	ARTICLE 12B, SECTION 349C
		SNOW & ICE REMOVAL	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		CLEANING	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		LIGHTING	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
3	BUS LAYOVER AREA	PARKING LOT PAVEMENT, CURBS, FENCES DRAINAGE, SIDEWALKS, SIGNAGE, PAVEMENT STRIPING, PLANTING AND MEDIAN/BUFFER REFUGE AREAS	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		CLEANING	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT
		LIGHTING	-	INTREPID MUSEUM	MAINTENANCE AGREEMENT WITH NYSDOT

AS-BUILT REVISIONS

SIGNATURE DATE

MAINTENANCE JURISDICTION PLAN AND TABLE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
MJP-1	DEC. 2000	1:300	EARTH TECH

A.R. CHECKED BY: R.L. DRAFTED BY: CHECKED BY: ESTIMATED BY:
N.S. CHECKED BY: A.R. DESIGNED BY:
N.S. IN CHARGE OF:

G:\DRAWGN
12 DEC. 2000
L: \NDRA\32822\ACAD\INTREPID-BRIDGE\PSAE\X024222A.L1A
L: \DELTEY\PROGRAM\CRDSTATION.PC6\DRV\PRINTER.PLT

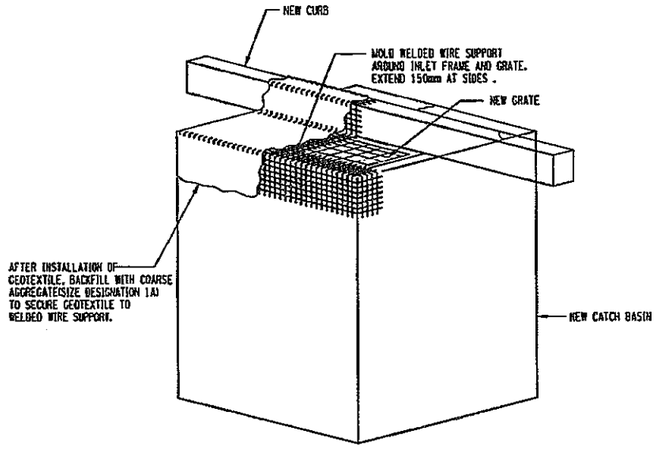
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	9	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

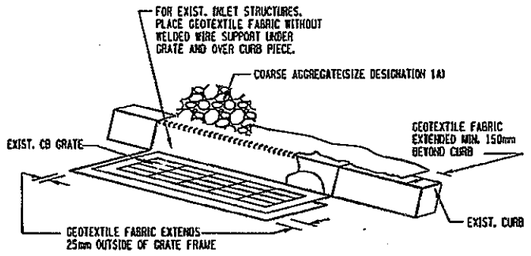
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22



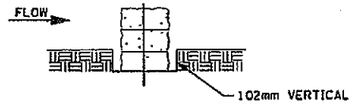
INLET FILTER SEDIMENT CONTROL FOR NEW CATCH BASIN

(PAYMENT UNDER ITEM 11209.11M)

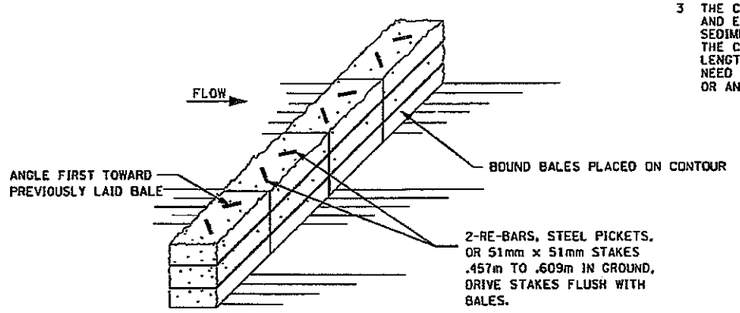


INLET FILTER SEDIMENT CONTROL FOR EXIST. CATCH BASIN

(PAYMENT UNDER ITEM 11209.12M)



BEDDING DETAIL



ANCHORING DETAIL

NOTE:

AT REMOVAL OF HAY BALES THE CONTRACTOR SHALL RESTORE THE GROUND TO THE ORGINAL CONDITION.

HAY BALE DETAILS

(PAYMENT UNDER ITEM 209.05M)

NOTES:

1 THE CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS OF THE APPLICABLE SPDES PERMIT. IN ADDITION TO ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHOWN ON THIS DWG., THE CONTRACTOR SHALL COMPLY WITH ALL ADDITIONAL MEASURES DEEMED NECESSARY BY THE ENGINEER PRIOR TO AND/OR DURING THE COURSE OF CONSTRUCTION. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE 'NEW YORK GUIDELINES OF URBAN EROSION AND SEDIMENT CONTROL'.

2 THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL SEDIMENTATION AND EROSION CONTROL DEVICES AND PROVIDING ANY ADDITIONAL DEVICES DEEMED NECESSARY BY THE ENGINEER DURING CONSTRUCTION. THE CONTRACTOR SHALL INSTALL HAYBALES AT THE BASE OF STOCKPILED MATERIALS, WHEN ORDERED BY THE ENGINEER, PAYMENT TO BE INCLUDED UNDER ITEM 209.05M.

3 THE CONTRACTOR SHALL INSPECT EACH INSTALLATION AFTER EACH STORM AND EXCESS MATERIAL SHALL BE REMOVED A.O.B.E. ALL TRAPPED SEDIMENT SHALL BE REMOVED A.O.B.E. AT NO ADDITIONAL COST TO THE STATE. THE CONTRACTOR SHALL MAINTAIN THE SILT PROTECTION DEVICE FOR THE LENGTH OF THE CONTRACT OR A.O.B.E. SHOULD THE FILTERING DEVICE NEED TO BE REPLACED, THE CONTRACTOR SHALL REPLACE THE SYSTEM OR ANY PART OF THE SYSTEM AT NO ADDITIONAL COST TO THE STATE.

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

EROSION AND SEDIMENT CONTROL DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
ECS-1	DEC 2000	NTS

LiRo-Kassner, Inc.

EARTH TECH

ESTIMATED BY: SH/MB CHECKED BY: GK DRAFTED BY: MC/MB/SH CHECKED BY: KH DESIGNED BY: SH/MB CHECKED BY: KH IN CHARGE OF: RP

USER MAY 2000 X024224.EDT

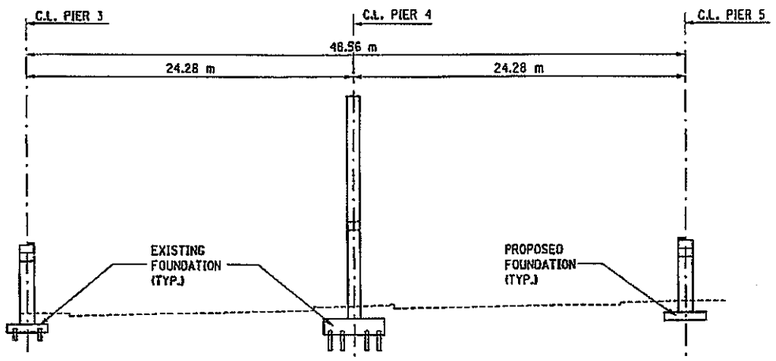
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	17	142

ROUTE 9A RECONSTRUCTION PROJECT

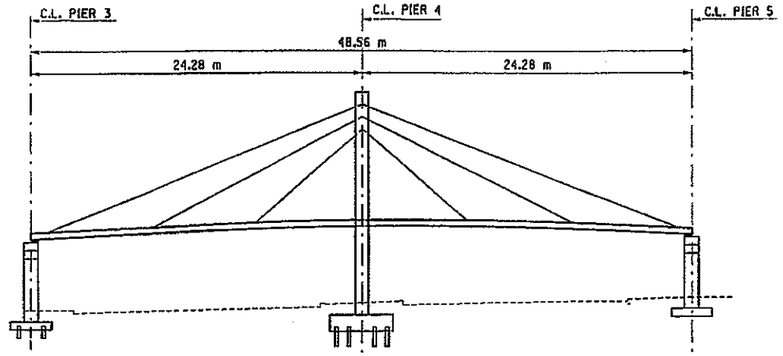
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

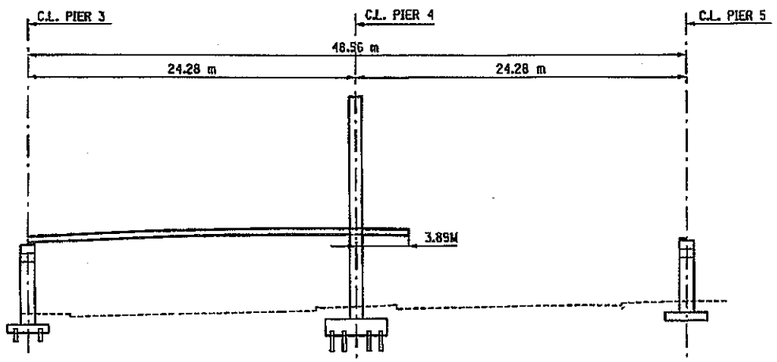
NEW YORK COUNTY PIN: X024.22



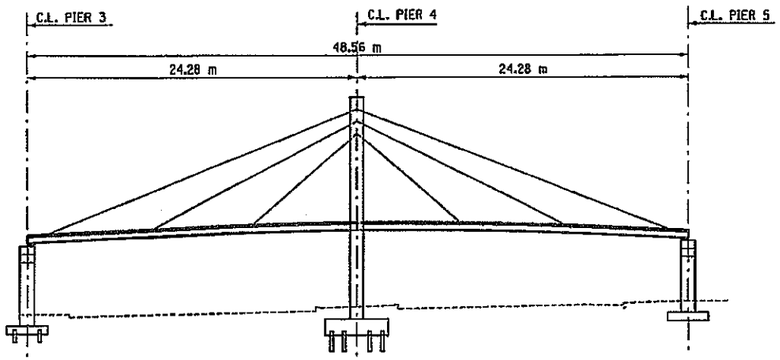
STAGE 3 – ERECT TOWER & END PIERS



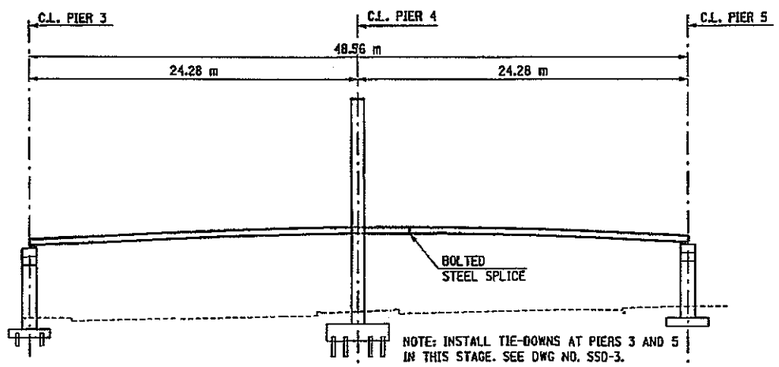
STAGE 5 – ERECT CABLES



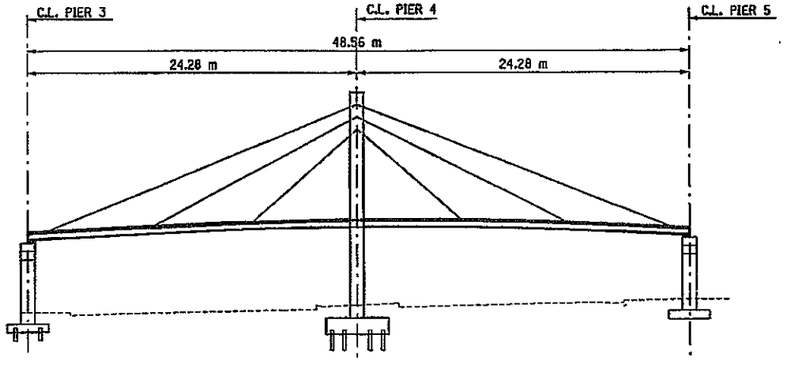
STAGE 4A – ERECT ONE SIDE OF BOX GRIDERS & FLOORBEAMS



STAGE 6 – CAST CONCRETE DECK



STAGE 4B – ERECT THE OTHER SIDE OF BOX GRIDERS & FLOORBEAMS



STAGE 7 – FINAL ADJUSTMENT OF CABLE TENSION

NOTES:

1. REFER TO DWG M-6 AND M-7 FOR CORRESPONDING MPT WORK FOR STAGES 3 AND 7.
2. STAGE 6: START PLACING CONCRETE FROM C.L. OF TOWER TOWARD END PIERS AND MAINTAIN A BALANCED CONDITION ABOUT C.L. OF TOWER. AT ALL TIMES THE PLACED CONCRETE DECK LENGTH SHALL BE KEPT WITHIN 3M LONG AT BOTH SIDES OF THE TOWER.
3. STAGE 7: ADJUST CABLE TENSION AFTER CONCRETE DEVELOPS 28 DAY DESIGN COMPRESSIVE STRENGTH.
4. THE CONTRACTOR SHALL SUBMIT HIS PROPOSED ERECTION STAGES INCLUDING COMPUTATION OF STRESSES, CAMBER AND DEFLECTION OF THE BRIDGE STRUCTURE FOR THE ENGINEER'S APPROVAL. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE VARIOUS BID ITEMS.

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
SUGGESTED ERECTION STAGING

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
M-8	DEC. 2000	1:200	EARTH TECH

J.M. CHECKED BY:
P.G. DRAFTED BY:
CHECKED BY:
ESTIMATED BY:
J.M.
R.H. DESIGNED BY:
N.S. IN CHARGE OF:

PLOTTED: 12/22/2000 @ 10:28:32
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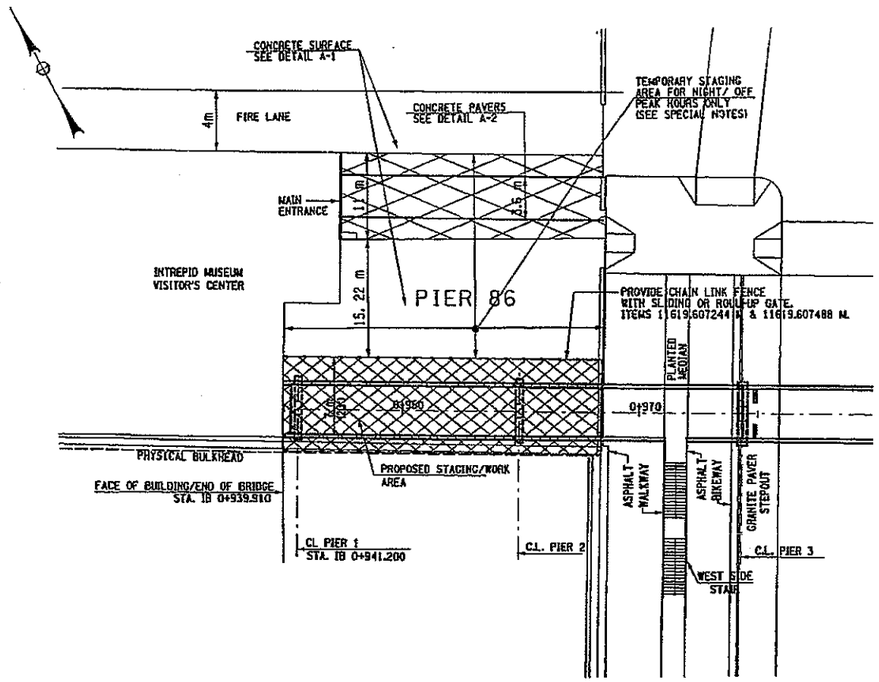
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	18	142

ROUTE 9A RECONSTRUCTION PROJECT

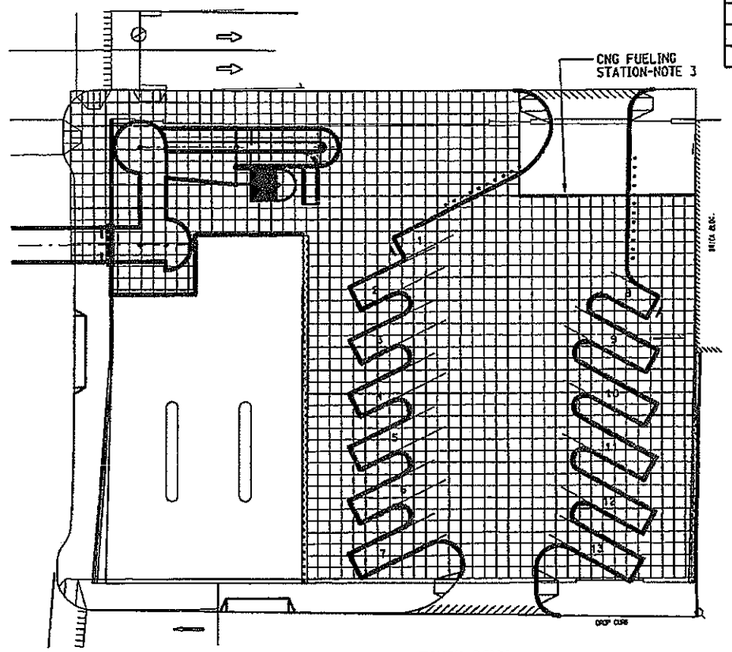
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



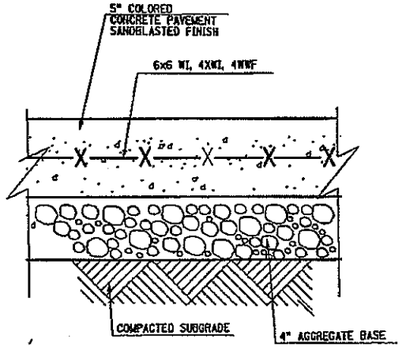
PLAN AT INTREPID MUSEUM
N.T.S



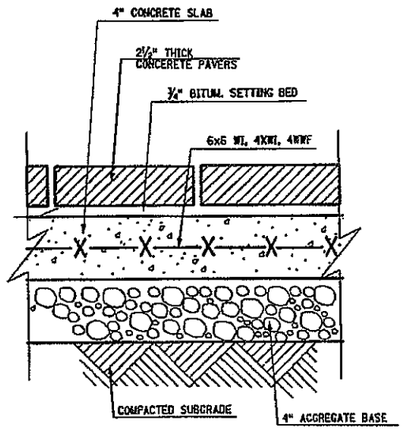
PLAN AT EAST TOUCH DOWN
N.T.S

NOTES

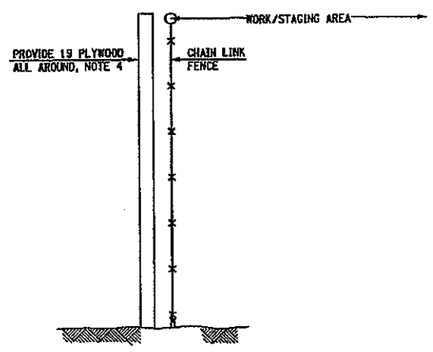
1. FOR REQUIREMENTS WHEN WORKING ON PIER 86 SEE SPECIAL NOTES ENTITLED "INTREPID SEA AIR SPACE MUSEUM" IN THE PROPOSAL.
2. DETAILS A1 & A2 PROVIDED FOR INFORMATION ONLY - SEE SPECIAL NOTES.
3. SEE SPECIAL NOTE IN THE PROPOSAL ENTITLED "PARKING AND STORAGE/ STAGING AREA".
4. PLYWOOD SHALL BE EXTERIOR TYPE, 5 PLY GRADE B-B OR BETTER. INNER PLIES SHALL BE GRADE B OR BETTER. PLYWOOD SHALL BE ATTACHED TO THE FENCE IN A MANNER ACCEPTABLE TO THE ENGINEER. THE PLYWOOD SHALL BE PAINTED BATTLESHIP GREY. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS 11619.607244M AND 11619.607488M.



COLORED CONCRETE PAVEMENT - DETAIL A-1
N.T.S.



CONCRETE PAVERS - DETAILS A-2
N.T.S.



CHAIN LINK FENCE DETAIL
N.T.S.

LEGEND

- NO EQUIPMENT TO BE PLACED IN THIS AREA.
- LIMITS OF CLEARING & GRUBBING ITEM 201.07M
- TEMPORARY STAGING & STORAGE AREA AT EAST TOUCHDOWN (SEE SPECIAL NOTES)

AS-BUILT REVISIONS

SIGNATURE DATE

TEMPORARY STAGING AREAS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
M-9	DEC. 2000	AS SHOWN	EARTH TECH

ESTIMATED BY: J.M. CHECKED BY: P.G. DRAFTED BY: J.M. CHECKED BY: J.M. DESIGNED BY: N.S. IN CHARGE OF:

PLOTTED
PLOT SCALE
L:\WORK\22822\CADD\INTREPID-BRIDGE\PSAE\X024222CA.DID
C:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	19	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY — PIN: X024.22

ELEVATIONS:
TS - 75: 2.511 METERS
TS - 76: 2.885 METERS

SOUTHBOUND
NORTHBOUND
W. 46th STREET
W. 45th STREET
HUDSON RIVER
PHYSICAL BULKHEAD
WALKWAY
PLANTER
BIKEWAY
PLANTED BUFFER
PLANTED MEDIAN
ROUTE 9A BASELINE
ARTERIAL LINE
PARKING LANE
SURVEY BASE LINE
PLATE WALL
PROPOSED TAKING LINE (TYP.)
ROW VARIES
PROPOSED PEDESTRIAN BRIDGE TO PROPOSED VISITORS CENTER
SURVEY CONTROL POINT N66344.7386 E300134.0239
SURVEY CONTROL POINT N66277.9172 E300093.8610
BENCH MARK DISC P 338 14+524.87 4.32 RT
P.O.B. PARCEL 62 14+586.029 1.725 RT
P.O.B. PARCEL 63
EQUALITY S 8+353.483 = N 8+352.448 OFFSET 9.3m LT.
PT = N 8+352.448
PT = S 8+334.634
S 8+300
N 8+400
S 8+400
STA. N 84396.975 W 46th STA. 14000
N28°59'15"E
N28°58'53"E 23.000m (75.46')
S28°58'53"W 8.000m (26.24')
N61°01'07"E 14.000m (45.63')
N61°01'07"E 11.000m (36.09')
N28°58'53"E 46.216m (151.63')
S28°58'53"W 61.213m (200.83')
N33°45'10"E 30.693m (100.70')
S28°58'53"W 30.608m (100.42')
N61°01'07"W 51.200m (167.98')
N61°01'07"W 2.286m (7.50')
R=280.0m
18.288m (60' ROW)
14+587.117
14+588.724 77.878 RT
14+571.427 13.249 RT
14+571.922 27.240 RT
14+563.432 13.532 RT
14+563.043 2.539 RT
14+556.440 2.808 RT
14+525.735 28.875 RT
14+524.851 3.890 RT
14+524.87 4.32 RT
14+524.770 1.606 RT
14+527.546 80.043 RT
14+509.154
LOT 11
LOT 12
N/F THIRD TORO FAMILY LTD., PTNSHP
LOT 17
N/F SMITH, PETER K.
BLOCK 1094
BLOCK 1107
LOT CITY - 30
BLOCK 1093 A12-13
CONSOLIDATED EDISON (REPUTED OWNER)
REMAINDER AREA= 1067.41 SQ. M. (11489 SQ. FT.)
62
FEE AREA = 3597.28 SQ. M. (38720 SQ. FT.)
63
FEE AREA = 34.99 SQ. M. (376 SQ. FT.)
LOT 42
N/F RM HOLDINGS COMPANY INC.
2160
1053
LOT 21
N/F 610 WEST 46th ST ENTRPS.
1831
1590
LOT 49
BLOCK 1092
GAS LINE PER CON-ED PLATE 27C (NOT VERIFIED)
3" HP PE, 6' 1991
8" C.L.F. ON GRANITE BLOCK WALL (FAIR/POOR)
8" C.L.F. ON 2' WIDE GRANITE BLOCK WALL (FAIR)
CONC. SIDEWALK
BRICK WALL (POOR)
CONC. (POOR)
SLIDING GATE
DROP CURB
GATE
TRENCH DRAIN
METAL EDGE
GRAVEL
BOOTH
PUMP
METAL BLDG.
ASPHALT
PARKING
OPEN
S.F.C.
6' C.L.F.
B' C.L.F.
40" HIGH METAL FENCE ON 12" CONC.
SHRUBS
EES
ICB
TS-75 4-CUT 4.15 2.10 3.58
TS-76 5.90 2.70 3.14

AS-BUILT REVISIONS

SIGNATURE — DATE

RIGHT-OF-WAY PLAN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
ROW-1	DEC. 2000	1:250	EARTHTECH

DRAWN BY: BAORKMAN
L:\WORK\32822\CADD\INTREPID-BRIDGE\ADP\X024228A.GID
G:\BENFLEY\PROGRAM\CROSSTATION\PLOTDRV\PRINTER.PLT
IN CHARGE OF: ____ N.S. ____ DESIGNED BY: ____ A.R. ____ CHECKED BY: ____ N.S. ____ ESTIMATED BY: ____
DRAFTED BY: ____ N.S. ____ CHECKED BY: ____ A.R. ____

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	20	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22

14+586.029
1.725 RT
14+587.117
8' C.L.F. ON GRANITE BLOCK WALL (FAIR/POOR)
S61°01'07"E 76.200m (250.00')
DROP CURB
DROP CURB
GATE
GATE
GRAVEL
TRENCH DRAIN
BOOTH
TRENCH DRAIN
METAL EDGE
ARTERIAL LINE
N28°58'53"E 23.000m (75.46')
14+571.427
13.249 RT
14+571.922
27.240 RT
N61°01'07"E 14.000m (45.63')
14+568.747
23.349 RT
14+563.432
13.532 RT
14+568.535
16.353 RT
14+563.043
2.539 RT
14+560.045
2.645 RT
14+555.440
2.808 RT
PARKING
LOT 9
BLOCK 1093
A12-13
CONSOLIDATED EDISON
(REPUTED OWNER)
N61°01'07"E 14.000m (45.93')
14+560.540
16.636 RT
62
FEE AREA =
3597.28 SQ. M.
(38720 SQ. FT.)
GRAVEL
ASPHALT
PUMP
METAL BLDG.
GRAVEL
GATE
ASPHALT
8' C.L.F.
BRICK BLDG.
LOT 42
N/F RM HOLDINGS COMPANY INC.
2160
1053
(200.83')
S28°58'53"W 61.213m
8' C.L.F.
LOT 21
N/F 610 WEST 46th ST ENTRPS.
1831
1590
PARKING LANE
SURVEY BASE LINE
N 31°00'30" E 77.963m
N 31°00'30" E 30.693m (100.70')
PLATE WALL
63
FEE AREA =
34.99 SQ. M.
(376 SQ. FT.)
N33°15'10"E 30.608m (100.42')
S28°58'53"W 30.608m (100.42')
14+524.851
3.890 RT
EXISTING LOT LINE
25.000 (82.02')
OFFSET
CONC. (POOR)
N61°01'07"W 51.200m (167.98')
CONC.
SLIDING GATE
BRICK WALL (POOR)
8' C.L.F. ON 2' WIDE GRANITE BLOCK WALL (FAIR)
CONC. SIDEWALK
P.O.B.
PARCEL 63
BENCH MARK DISC
P 338
14+524.87
4.32 RT
N61°01'07"W
2.286m (7.50')
14+524.770
1.606 RT
S.F.C.
14+525.558
23.878 RT
DROP CURB
W. 45th STREET

AS-BUILT REVISIONS

SIGNATURE DATE

TEMPORARY CONSTRUCTION EASEMENT

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
ROW-2	DEC. 2000	1:150	

DESIGNED BY:
DRAFTED BY:
CHECKED BY:
CHECKED BY:
ESTIMATED BY:
CHECKED BY:
IN CHARGE OF:

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	21	142

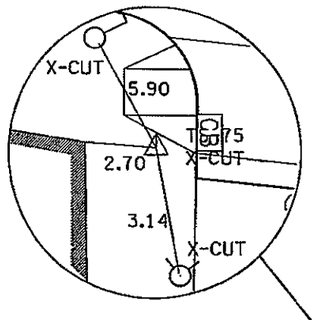
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

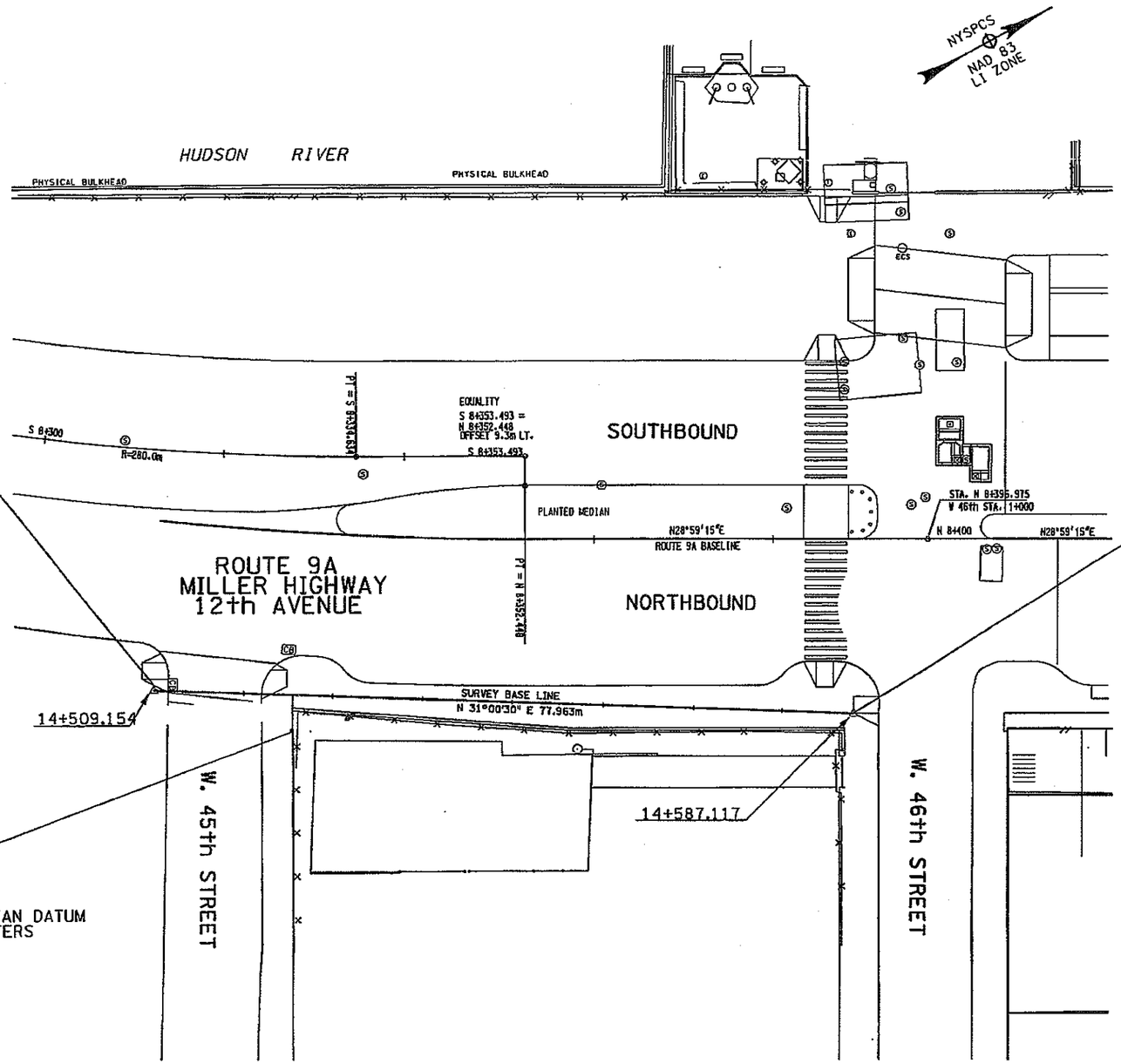
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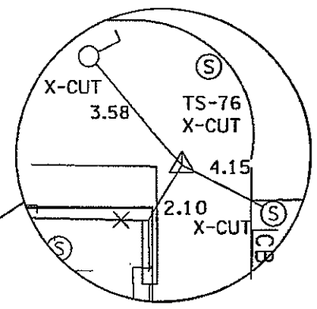
NEW YORK COUNTY PIN: X024.22

NOTE:
HORIZONTAL DATUM
NEW YORK STATE PLANE
LONG ISLAND ZONE
NAD 1983
PER GPS OBSERVATIONS



SURVEY CONTROL POINT
N66277.9172
E300093.8610





SURVEY CONTROL POINT
N66344.7386
E300134.0239

BENCH MARK DISC
P 338
STA 14+524.87
4.32 RT
BOROUGH OF MANHATTAN DATUM
ELEVATION 0.838 METERS

AS-BUILT REVISIONS

SIGNATURE DATE

SURVEY CONTROL POINTS

The RBA Group Engineers • Architects • Planners
27 UNION SQUARE WEST, 4th FLOOR
NEW YORK, NY 10003-3166
(212) 741-8090

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SC-1	MAY 2000	NTS	EARTH TECH

CHECKED BY:
DRAFTED BY:
CHECKED BY:
CHECKED BY:
ESTIMATED BY:
CHECKED BY:
DESIGNED BY:
IN CHARGE OF:

PCAMELE
12/18/99
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J:\PROJECTS\2282\CADD\INTREPID-PROJDEF\RBAINTREPIDSITES (2).DGN

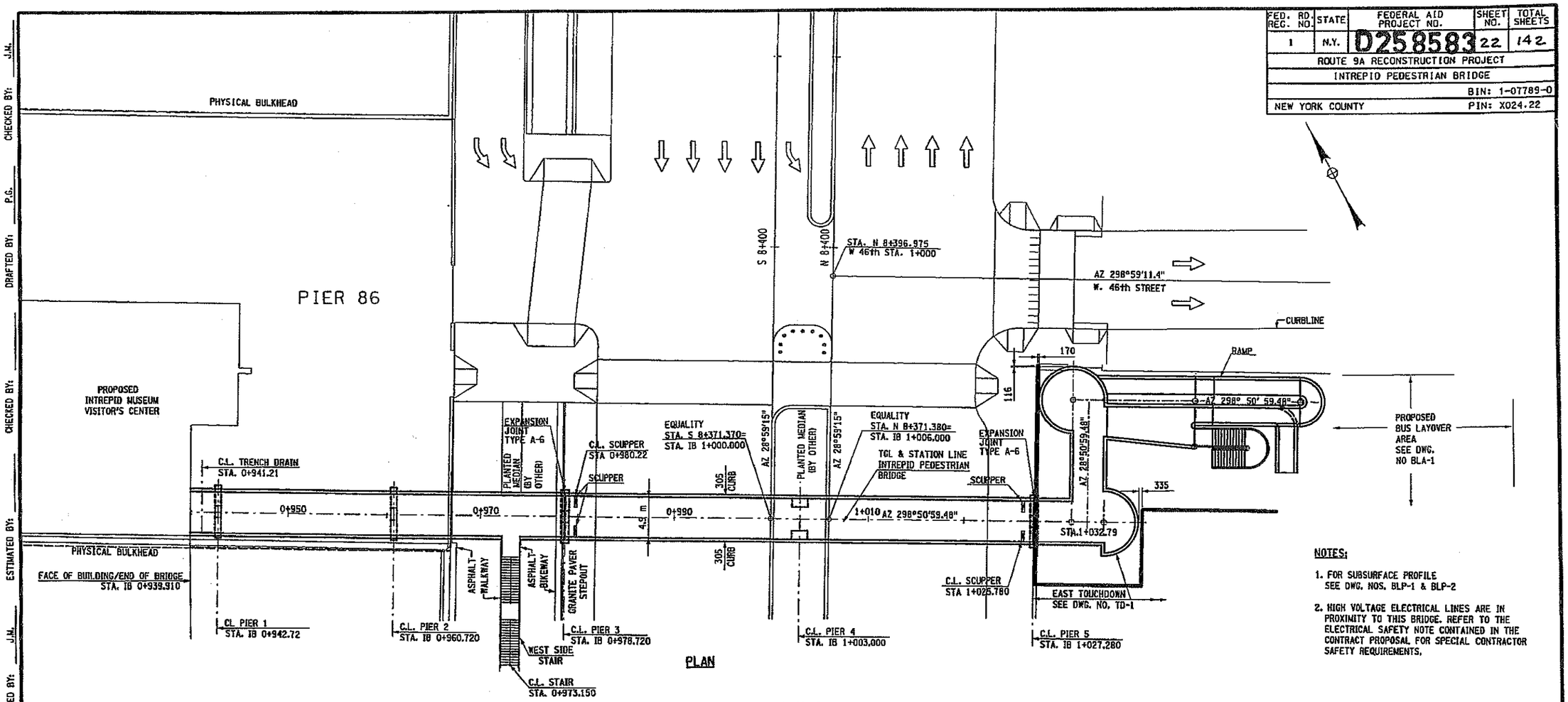
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	22	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



NOTES:

1. FOR SUBSURFACE PROFILE SEE DWG. NOS. BLP-1 & BLP-2
2. HIGH VOLTAGE ELECTRICAL LINES ARE IN PROXIMITY TO THIS BRIDGE. REFER TO THE ELECTRICAL SAFETY NOTE CONTAINED IN THE CONTRACT PROPOSAL FOR SPECIAL CONTRACTOR SAFETY REQUIREMENTS.

AS-BUILT REVISIONS

SIGNATURE DATE

GENERAL PLAN AND ELEVATION

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
GP-1	DEC. 2000	1:200	

DESIGNED BY: R.H./J.M. DRAFTED BY: P.G. CHECKED BY: J.M. CHECKED BY: ESTIMATED BY: J.M. CHECKED BY: J.M. IN CHARGE OF: J.M.

PLOTTED: 12/18/2000 @ 12:32:22
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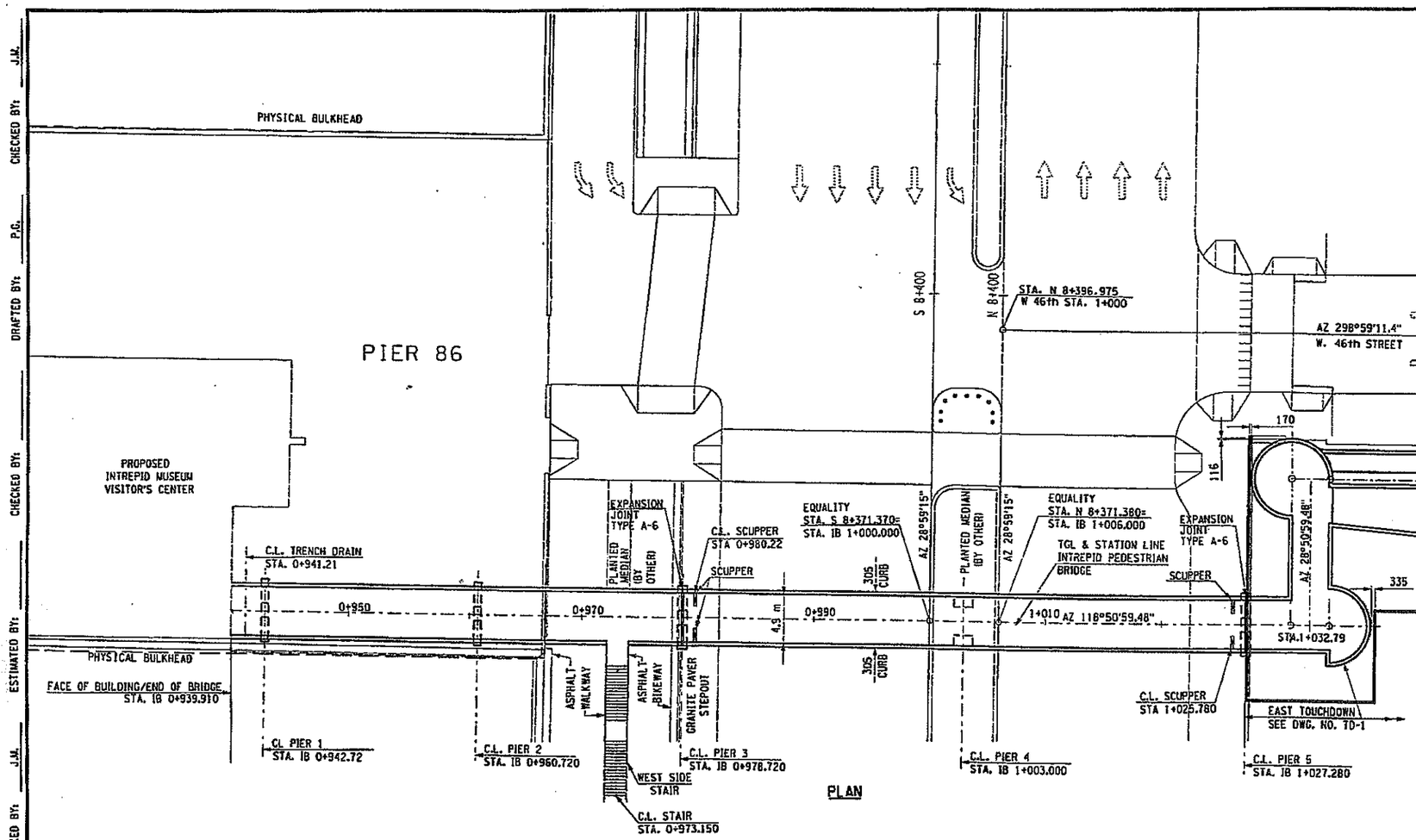
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	23	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



NOTES:

1. FOR SUBSURFACE PROFILE SEE DWG. NOS. BLP-1 & BLP-2
2. HIGH VOLTAGE ELECTRICAL LINES ARE IN PROXIMITY TO THIS BRIDGE. REFER TO THE ELECTRICAL SAFETY NOTE CONTAINED IN THE CONTRACT PROPOSAL FOR SPECIAL CONTRACTOR SAFETY REQUIREMENTS.

AS-BUILT REVISIONS

SIGNATURE DATE

GENERAL PLAN AND ELEVATION

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
GP-1	DEC. 2000	1:200	EARTH TECH

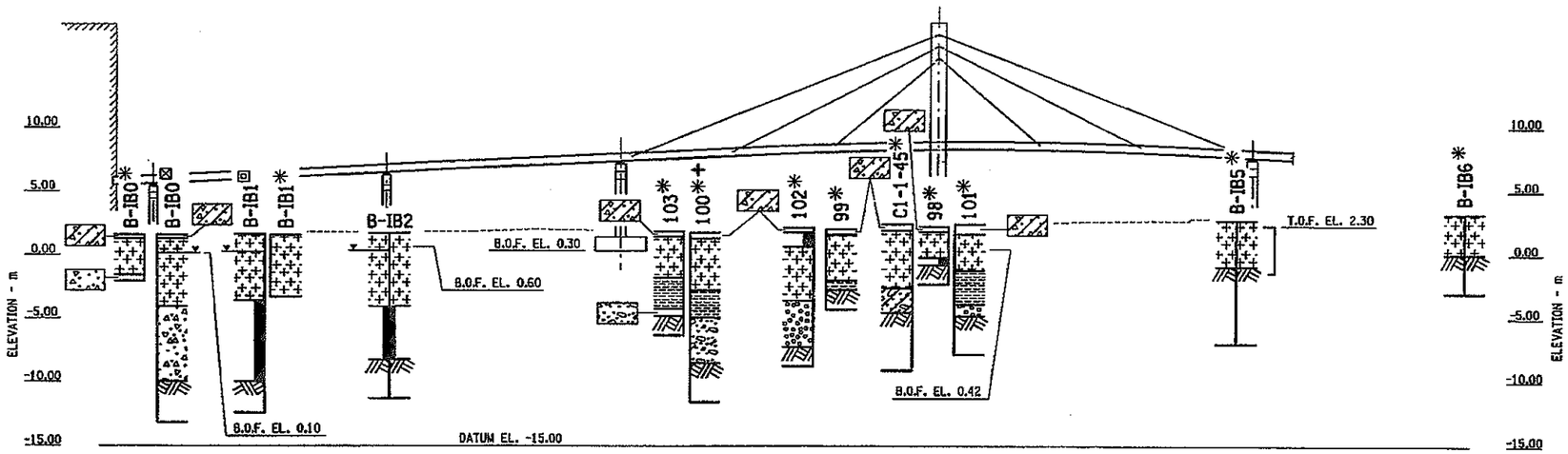
ESTIMATED BY: J.M. CHECKED BY: P.G. DRAFTED BY: CHECKED BY: J.M. CHECKED BY: DESIGNED BY: R.H/J.M. IN CHARGE OF: J.M.

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01/24/2001
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FED ROAD REC. NO.	STATE	CONTRACT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	24	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
NEW YORK COUNTY

P.I.N. X024.22 | B.I.N. 1077890



GENERAL SUBSURFACE PROFILE
ELEVATION A-A

5 0 5 10 15 20 m
SCALE

☒ BORING RELOCATED 1m NORTHEAST DUE TO CLOSENESS TO EDGE OF DOCK AND CONCRETE ENCOUNTERED

⊡ BORING RELOCATED 3.3m NORTHWEST DUE TO OBSTRUCTIONS AND CLOSENESS TO ELECTRIC UTILITY

✱ NO WATER OBSERVED IN DRILL HOLE

✚ BORING OFFSET FOR PLOTTING

ALL DIMENSIONS ARE IN m UNLESS OTHERWISE NOTED

SYMBOLS

DRILL HOLE 98, BI-B, C1-1

OBSERVED WATER LEVEL

CONCRETE

Asphalt and Concrete Rubble

Loose to Medium Compact Brown Sandy GRAVEL, Silty with Rock Fragments and Silty SAND, Gravelly with Fill Material

Loose to Medium Compact Brown Sandy GRAVEL, Silty and Brown Silty SAND, Gravelly

Loose to Medium Compact Dark Brown Silty SAND with Organic Material

Loose to Medium Compact Red/Brown Silty SAND

Compact to Very Compact Red/Brown Silty SAND, Gravelly and Red/Brown Sandy GRAVEL, Silty

Boulders and Rock Fill

LEDGEROCK

APPROVED 3/27/00

W. P. MOODY
DIRECTOR
GEOTECHNICAL ENGINEERING BUREAU

AS BUILT REVISIONS

SIGNATURE DATE

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
GENERAL SUBSURFACE PROFILE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

FILENAME	MD NO.	DATE	DRAWING NO.
X02422AP.GE8	11GE0155B	3/10/00	BLP-2

DESIGN SUPERVISOR D.J.A. 3/27/00 JOB MANAGER DESIGNED BY D.B.D. CHECKED BY S.L.B.
DRAFTED BY B.A.M. CHECKED BY M.E.I.
ESTIMATED BY

FILE NAME = BGNESPC
DATE/TIME = 12/18/08
USER = PGamble

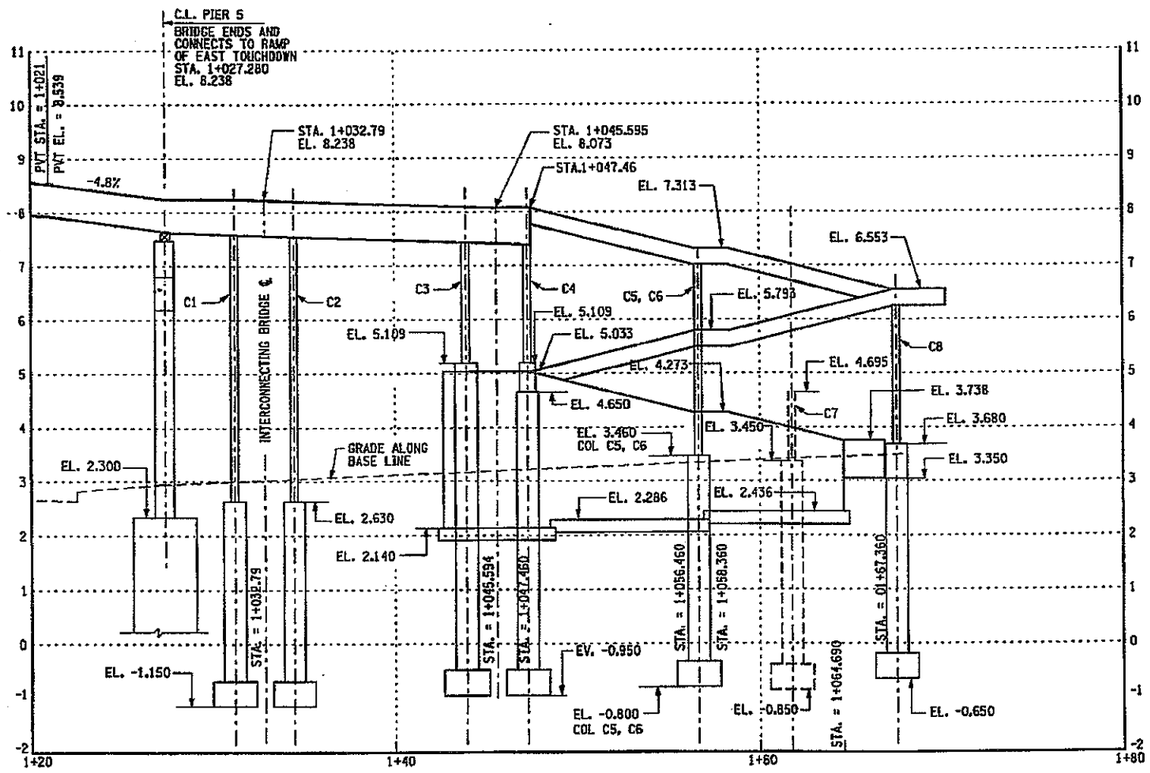
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	25	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024-22



PEDESTRIAN RAMP PROFILE

(ALONG BASE LINE)

SCALE 1:150 H
1: 50 V

NOTES:

1. ELEVATION TO BOTTOM OF COLUMN PEDESTAL FOOTING ARE APPROXIMATE ONLY. ACTUAL DEPTH TO BE TO TOP OF ROCK AS DETERMINED DURING CONSTRUCTION.
2. ALL BOTTOM OF FOOTING ELEVATIONS ARE PRESUMED TOP OF ROCK. CONTRACTOR SHALL DETERMINE ACTUAL TOP OF ROCK ELEVATION DURING CONSTRUCTION.

AS-BUILT REVISIONS

SIGNATURE DATE

PROFILE - EAST TOUCHDOWN

BARBARA THAYER, P.C.
350 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BP-2	DEC. 2000	AS NOTED

EARTH TECH

DESIGNED BY: GF, AS CHECKED BY: JV, FS DRAFTED BY: EL, RM, IV CHECKED BY: JV ESTIMATED BY: FS IN CHARGE OF: BT

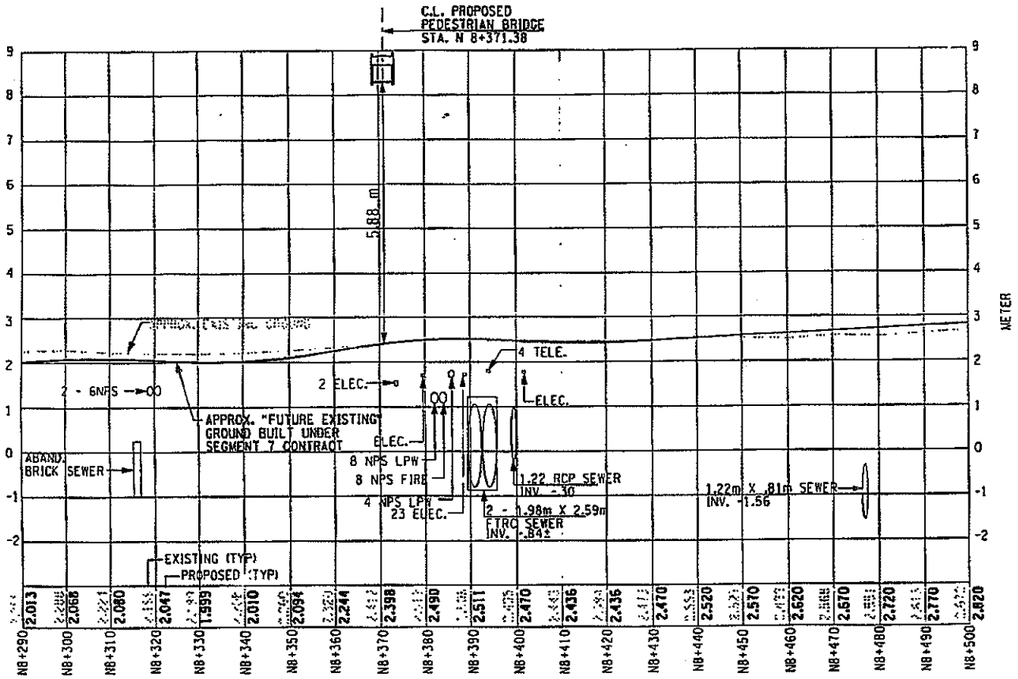
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	26	142

ROUTE 9A RECONSTRUCTION PROJECT

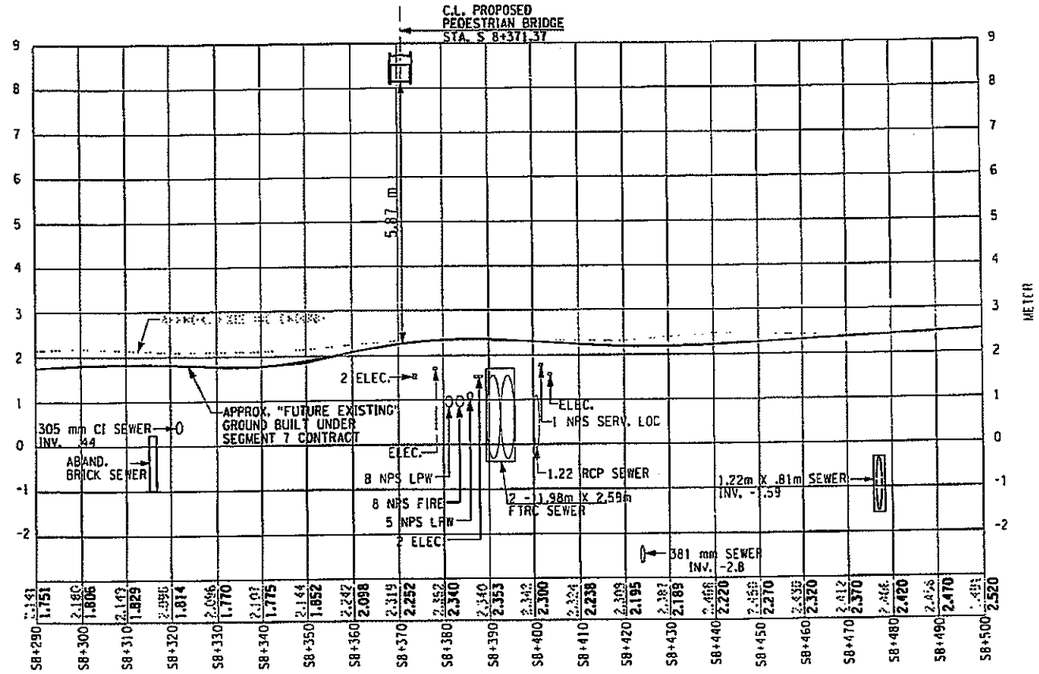
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



EXISTING NORTHBOUND ROUTE 9A PROFILE
1:600 H
1:60 V



EXISTING SOUTHBOUND ROUTE 9A PROFILE
1:600 H
1:60 V

AS-BUILT REVISIONS

SIGNATURE DATE

UNDERBRIDGE PROFILES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BP-3	DEC. 2000	AS NOTED	

A.R. CHECKED BY: R.L. DRAFTED BY: CHECKED BY: ESTIMATED BY: N.S. CHECKED BY: DESIGNED BY: A.R. IN CHARGE OF: N.S.

M:\169\26ZO
BY: 2/24/2000 11:
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D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT

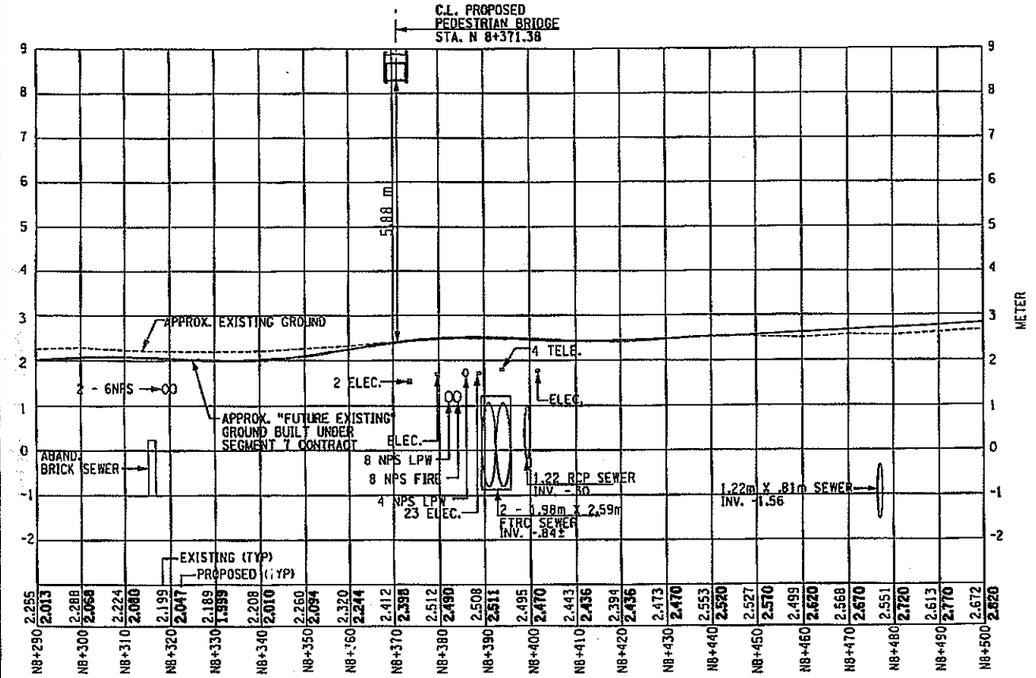
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	27	142

ROUTE 9A RECONSTRUCTION PROJECT

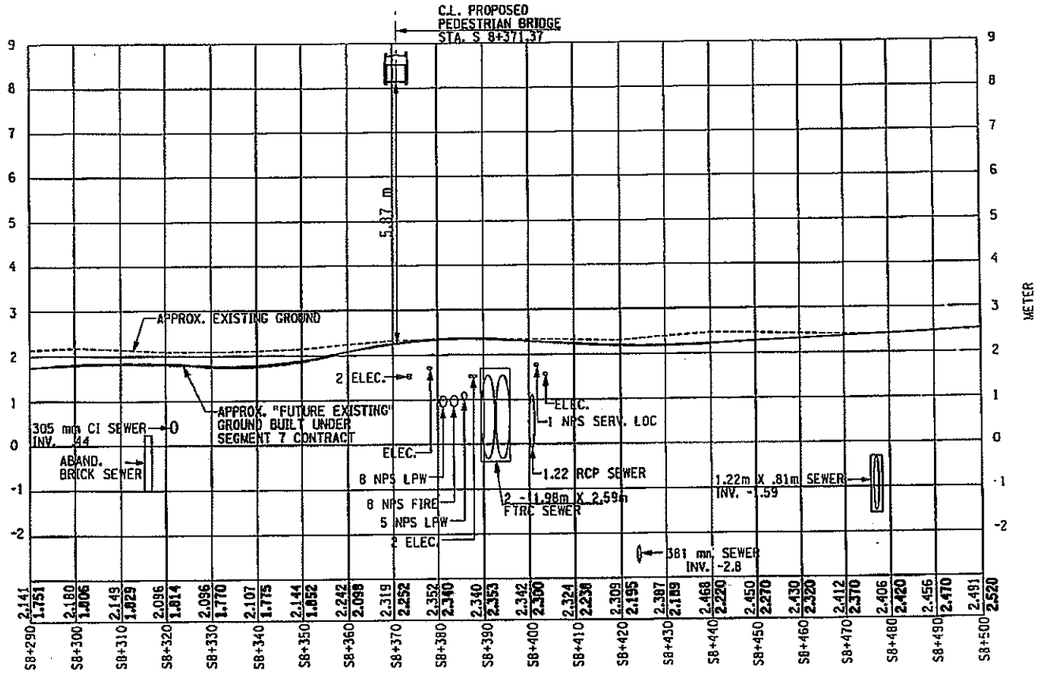
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



EXISTING NORTHBOUND ROUTE 9A PROFILE
1:600 H
1:60 V



EXISTING SOUTHBOUND ROUTE 9A PROFILE
1:600 H
1:60 V

AS-BUILT REVISIONS

SIGNATURE DATE

UNDERBRIDGE PROFILES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BP-3	DEC. 2000	AS NOTED	

DRAFTED BY: R.L. CHECKED BY: A.R.
CHECKED BY: ESTIMATED BY:
CHECKED BY: N.S. DESIGNED BY: A.R.
IN CHARGE OF: N.S.

BJORKMAN
12 DEC 2000
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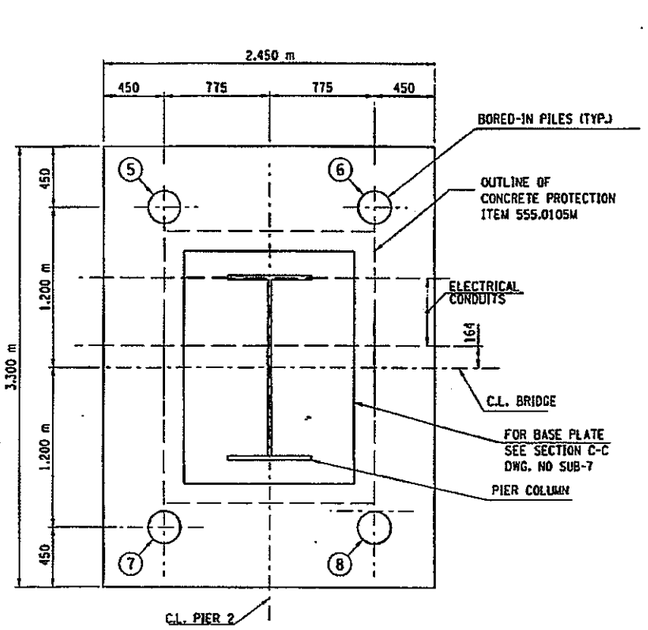
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1	N.Y.	D258583	28	142

ROUTE 9A RECONSTRUCTION PROJECT

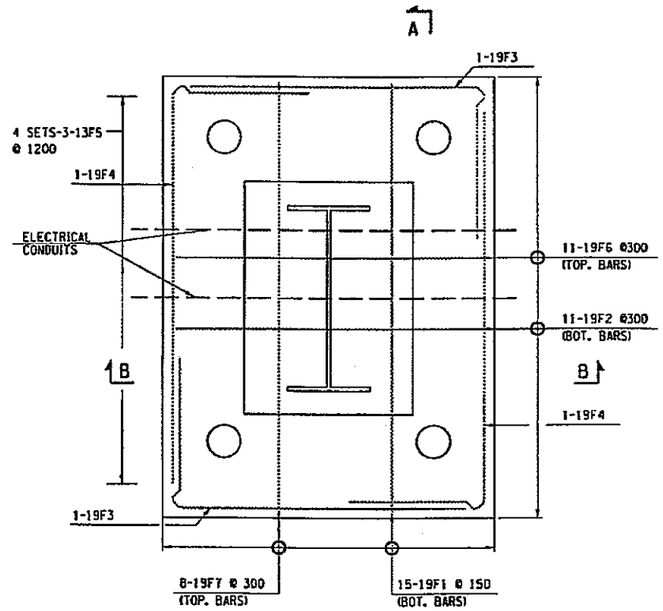
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



PLAN VIEW OF FOOTING FOR PIER 2
SCALE 1:20



REINFORCEMENT PLAN FOR PIER 2
SCALE 1:20

NOTE:
1. FOR NOTES AND EXCAVATION DETAILS SEE DWG. SUB-1
2. FOR BAR LIST SEE DWG. NO. BL-1.
3. FOR CONCRETE PROTECTION DETAIL AROUND PIER, SEE DWG-NO. SUB-8

CONCRETE TABLE

ITEM NO.	DESCRIPTION	QUANTITY
555.0104M	~~FOOTING CONCRETE-CLASS A (NO CONCRETE CLASS SUBSTITUTION PERMITTED)~~	7.3CM
555.0105M	CONCRETE FOR STRUCTURES CLASS A	1.2CM

(NIC)

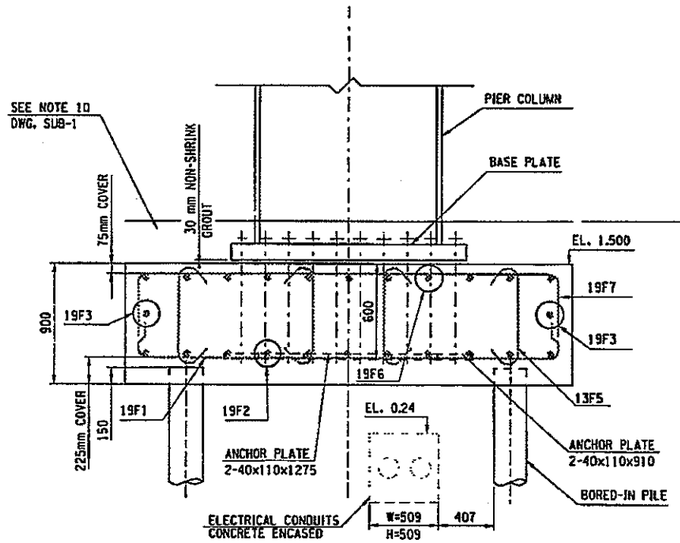
LEGEND:

⊛ - PILE NUMBERS

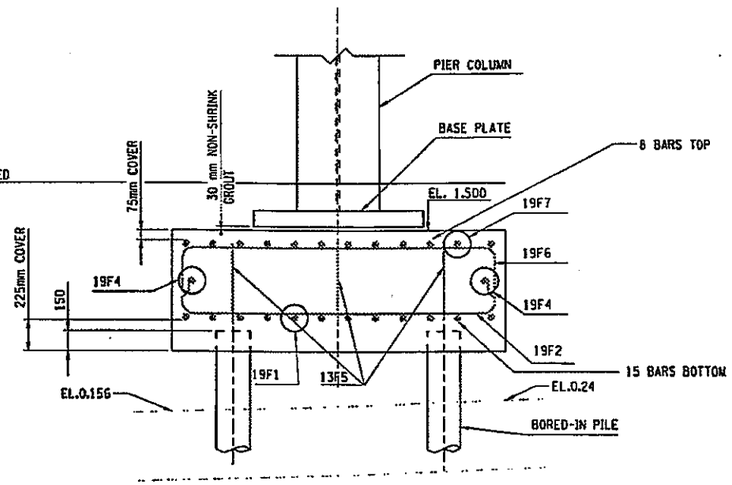
PILE LENGTHS

PILE NO.	LENGTH (M)
5	12.44
6	12.44
7	12.44
8	12.44

(NIC)



SECTION A-A
SCALE 1:20



SECTION B-B
SCALE 1:20
ANCHOR PLATES NOT SHOWN FOR CLARITY

NOTE: ANCHOR BOLTS, FOOTINGS AND PILES NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
FOUNDATION AT PIER 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-2	DEC. 2000	1:20	EARTH TECH

J.M. CHECKED BY: R.L. DRAFTED BY: J.D. CHECKED BY: J.B. DESIGNED BY: N.S. IN CHARGE OF: A.K. ESTIMATED BY:

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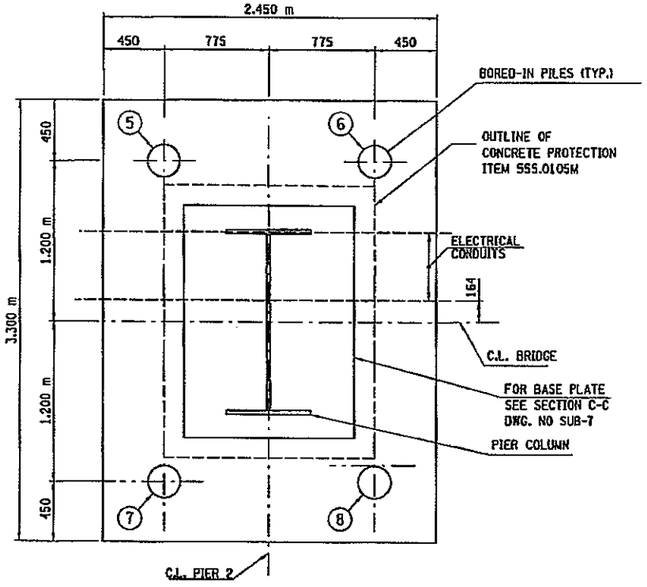
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	29	142

ROUTE 9A RECONSTRUCTION PROJECT

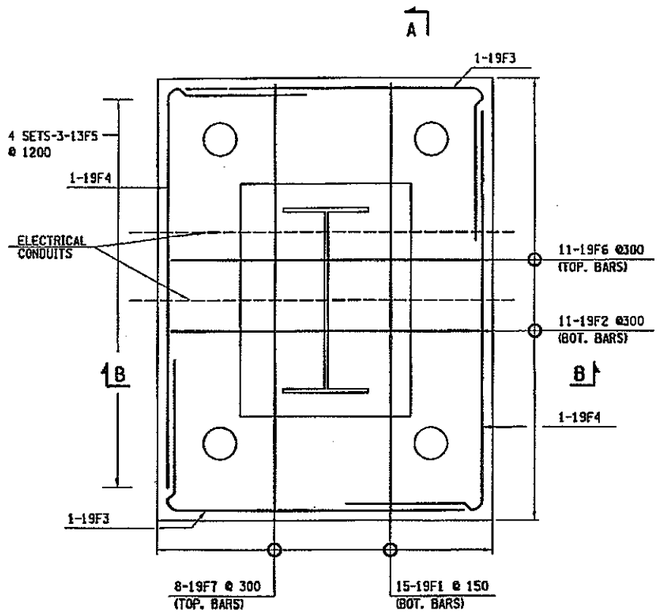
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



PLAN VIEW OF FOOTING FOR PIER 2
SCALE 1:20



REINFORCEMENT PLAN FOR PIER 2
SCALE 1:20

NOTE:
1. FOR NOTES AND EXCAVATION DETAILS SEE DWG. SUB-1
2. FOR BAR LIST SEE DWG. NO. BL-1.
3. FOR CONCRETE PROTECTION DETAIL AROUND PIER, SEE DWG-NO. SUB-8

CONCRETE TABLE

ITEM NO.	DESCRIPTION	QUANTITY
555.0104M (NIC)	~~FOOTING CONCRETE-CLASS A (NO CONCRETE CLASS SUBSTITUTION PERMITTED)~~	7.3CM
555.0105M	CONCRETE FOR STRUCTURES CLASS A	1.2CM

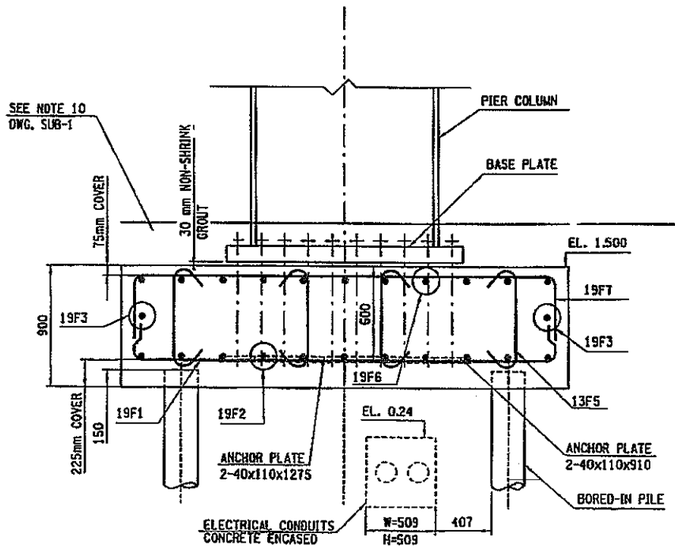
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(*) - PILE NUMBERS

PILE LENGTHS

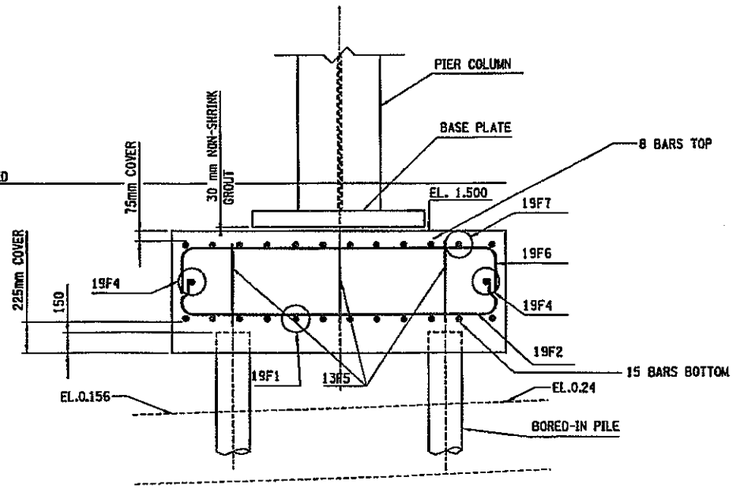
PILE NO.	LENGTH (M)
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6	12.44
7	12.44
8	12.44

(NIC)



SECTION A-A
SCALE 1:20

EXISTING & PROPOSED GRADE EL. 1.82



SECTION B-B
SCALE 1:20
ANCHOR PLATES NOT SHOWN FOR CLARITY

NOTE: ANCHOR BOLTS, FOOTINGS AND PILES NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
FOUNDATION AT PIER 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-2	DEC. 2000	1:20	EARTH TECH

J.M. CHECKED BY: R.L. DRAFTED BY: J.D. CHECKED BY: J.D. ESTIMATED BY: A.K. DESIGNED BY: J.B. M.S. IN CHARGE OF:

BJORKMAN
12 DEC 2000
L:\NEW YORK\REHABILITATION\ROUTE 9A\DRAWINGS\SUB2.PLT

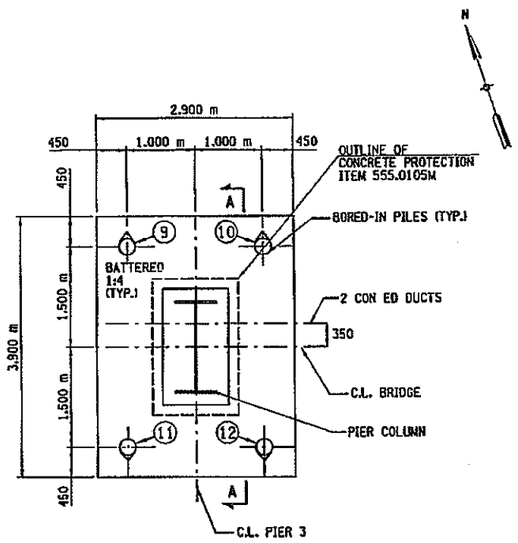
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	30	142

ROUTE 9A RECONSTRUCTION PROJECT

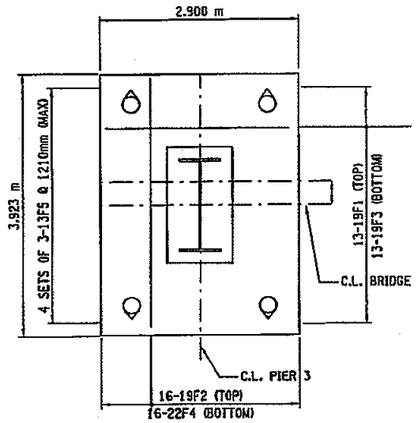
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



PLAN VIEW OF FOOTING FOR PIER 3
SCALE 1:40



REINFORCEMENT PLAN OF FOOTING FOR PIER 3
SCALE 1:40

CONCRETE TABLE

ITEM No.	DESCRIPTION	LOCATION	QUANTITY
555.0104M	~~FOOTING CONCRETE CLASS A (NO CLASS SUBSTITUTION PERMITTED)~~	~~PIER 3~~	~~12.5 CM~~
555.0105M	CONCRETE FOR STRUCTURE CLASS A	PIER 3	1.2 CM

(NIC)

NOTES:

1. FOR NOTES SEE DWG-NO.SUB-1
2. FOR BAR LIST SEE DWG. BL-2
3. FOR CONCRETE PROTECTION AT PIER SEE DWG NO. SUB-8
4. ~~FOR LOCATIONS & TEMPORARY SUPPORT OF CON ED DUCTS , SEE DWGS. DU-2 AND DU-3~~ — (NIC)
5. FOR SIDEWALK RESRORATION DETAILS SEE DWG. NO. RP-1

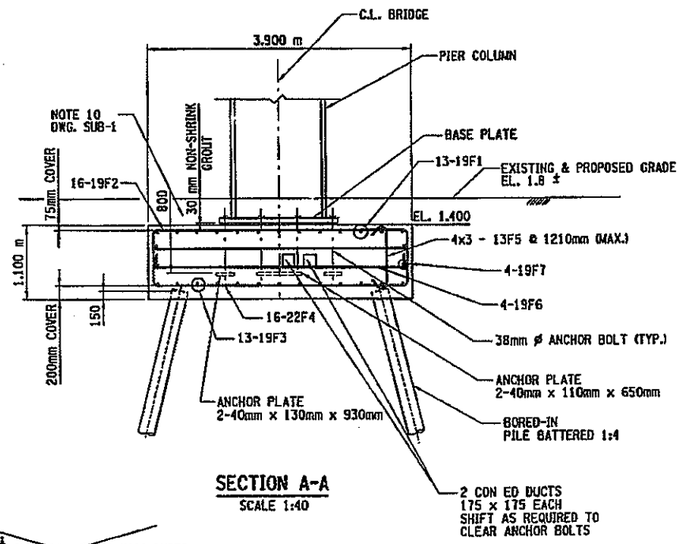
LEGEND:

(**) - PILE NUMBERS

PILE LENGTHS

PILE NO.	LENGTH (m)
9	15.49
10	15.49
11	15.49
12	15.49

(NIC)



SECTION A-A
SCALE 1:40

NOTE: ~~CLEAN SURFACE OF ELECTRIC DUCTS AND EMBED THEN INTO FOOTING~~ — (NIC)

NOTE: ANCHOR BOLTS, FOOTINGS AND PILES NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
PIER 3 FOUNDATION

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

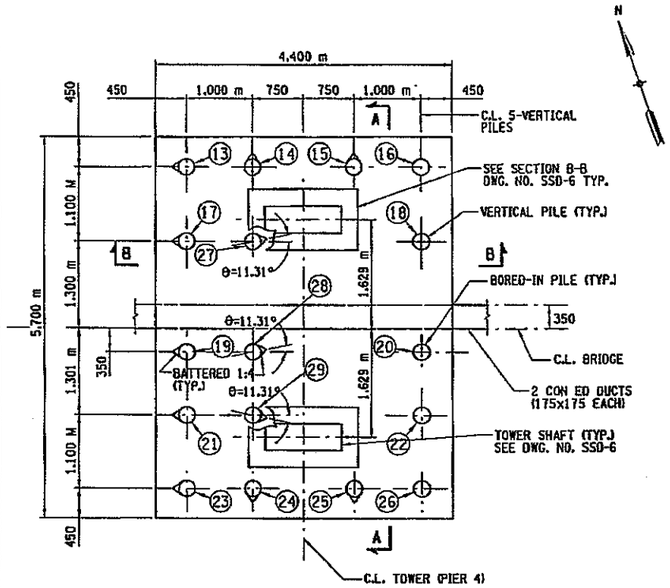
DWG. NO.	DATE	SCALE	EARTH TECH
SUB-3	DEC. 2000	AS NOTED	

J.N. CHECKED BY: R.L. DRAFTED BY: J.D. CHECKED BY: RH/A.K. ESTIMATED BY: J.M. CHECKED BY: R.H. DESIGNED BY: N.S. IN CHARGE OF:

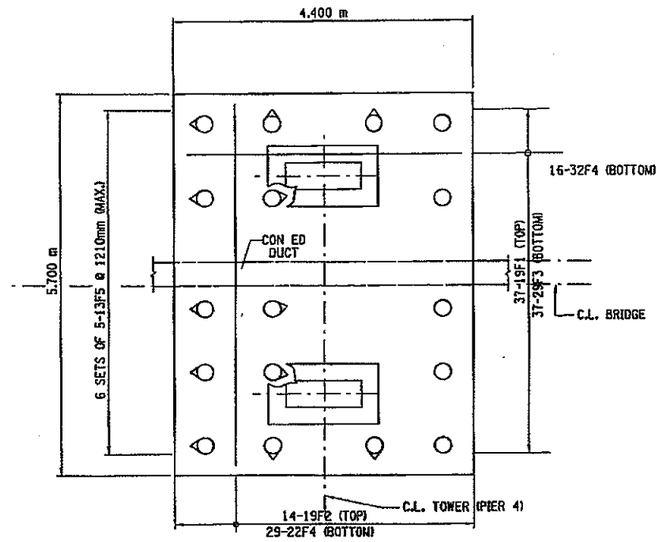
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12 DEC 2000
L:\WORK\36622\CADD\INTREPID-BRIDGE\ADPLX82422CA.PLT H
L:\WEHTLE\VHDGRAPHICS\STATION-PLOTDRV\PALMER.PLT H

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	31	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22



PLAN VIEW OF FOOTING FOR TOWER (PIER 4)
SCALE 1:40



REINFORCEMENT PLAN FOR TOWER (PIER 4)
SCALE 1:40

CONCRETE TABLE

ITEM No.	DESCRIPTION	LOCATION	QUANTITY
555.0104M	~~FOOTING CONCRETE CLASS A (NO CLASS SUBSTITUTION PERMITED)~~	PIER 4	44 CM
555.0105M	CONCRETE FOR STRUCTURES CLASS A	PIER 4	4.5 CM

NIC

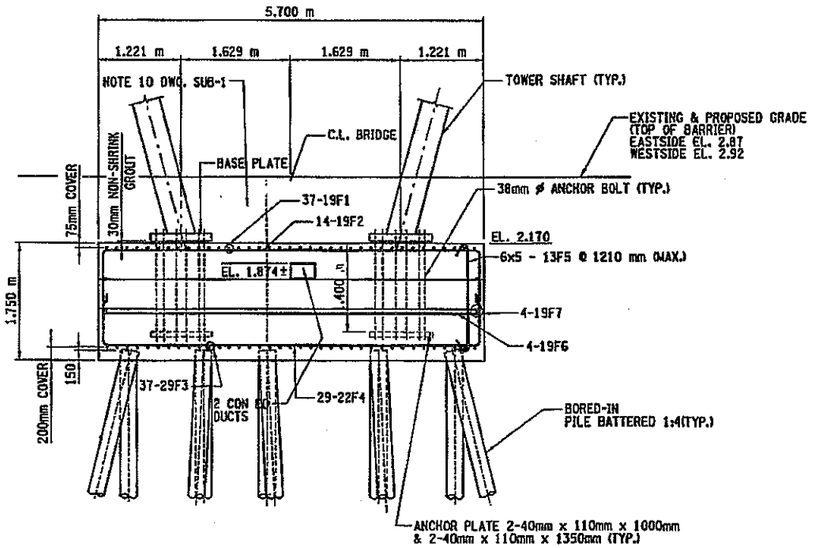
NOTES:

1. FOR NOTES SEE DWG-NO. SUB-1
2. FOR BAR LIST SEE DWG. NO. BL-2
3. FOR CONCRETE PROTECTION AT PIERS SEE DWG NO. SUB-8
4. ~~FOR LOCATIONS & TEMPORARY SUPPORT OF CON ED DUCTS . SEE DWGS. DU-2 AND DU-3~~ — (NIC)
5. FOR MEDIAN RESTORATION DETAIL SEE DWG. NO. RP-1

LEGEND:

(**) - PILE NUMBERS

PILE NO.	LENGTH
13	9.41
14	6.45
15	6.45
16	9.39
17	9.41
18	6.34
19	9.41
20	6.34
21	9.41
22	6.34
23	9.41
24	6.31
25	6.35
26	6.34
27	9.39
28	9.39
29	9.39

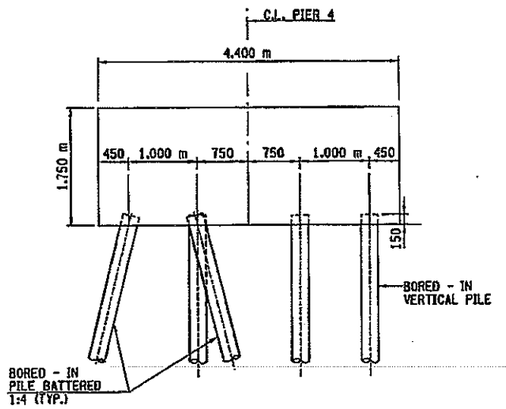


SECTION A-A
SCALE 1:40

NOTE:

A. CONCRETE PROTECTION AT TOWER SHAFT NOT SHOWN

~~B. CLEAN SURFACE OF ELECTRIC DUCTS AND EMBED THEM INTO FOOTING~~ — (NIC)



SECTION B-B - PILE ARRANGEMENT
SCALE 1:40

NOTE: ANCHOR BOLTS, FOOTINGS AND PILES NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
PIER 4 FOUNDATION

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-4	DEC. 2000	AS NOTED	EARTH TECH

J.M. CHECKED BY: R.L. DRAFTED BY: J.D. CHECKED BY: J.M. ESTIMATED BY: A.H./A.K. CHECKED BY: R.H. DESIGNED BY: N.S. IN CHARGE OF:

D:\DGN\SUB4.DGN
12 USER: CSBB
C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT

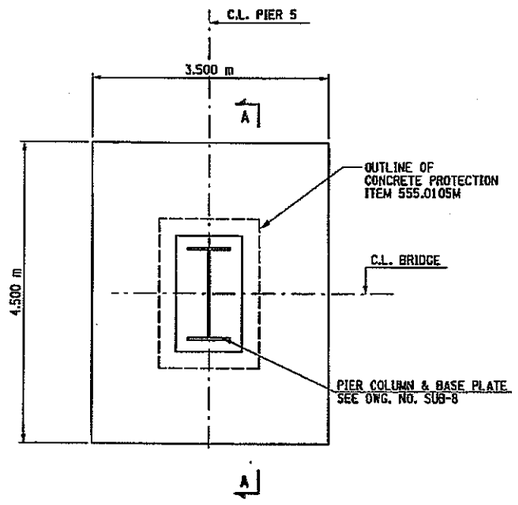
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	32	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

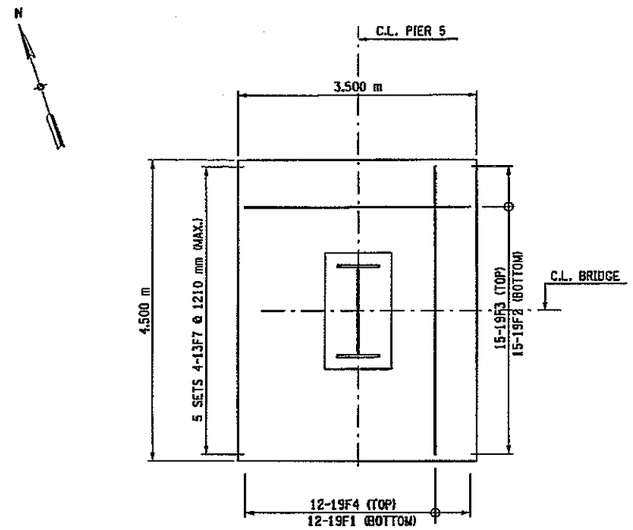
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



PLAN VIEW OF FOOTING FOR PIER 5

SCALE 1:40



REINFORCEMENT PLAN FOR PIER 5

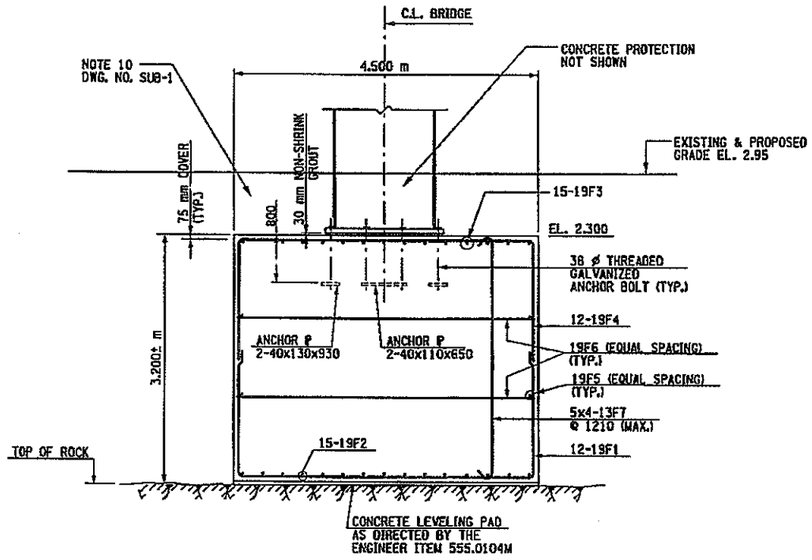
SCALE 1:40

CONCRETE TABLE

ITEM No.	DESCRIPTION	LOCATION	QUANTITY
555.0104M	FOOTING CONCRETE CLASS A (NO CLASS SUBSTITUTION PERMITED)	PIER 5	55 CM ±
555.0105M	CONCRETE FOR STRUCTURE CLASS A	PIER 5	1.5 CM

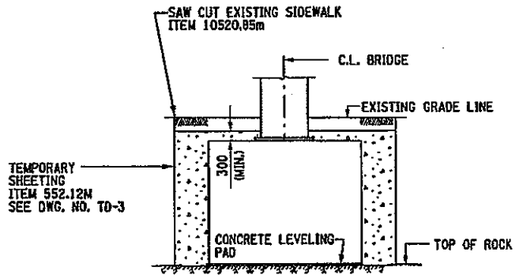
NOTES:

1. FOR NOTES SEE DWG. NO. SUB-1
2. FOR BAR LIST SEE DWG. NO. BL-3
3. FOR CONCRETE PROTECTION SEE DWG. NO.SUB-8
4. FOR SIDEWALK RESTORATION DETAILS SEE DWG. NO. RP-1



SECTION A-A

SCALE 1:40



NOTE: PROGRESS THE EXCAVATION TO THE ROCK SURFACE

BACKFILL WITH SUITABLE EXCAVATED MATERIAL AS PROVIDED UNDER ITEM 206.01M

TYPICAL EXCAVATION DETAIL

(ITEM 206.01N)

SCALE 1:80

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
PIER 5 FOUNDATION

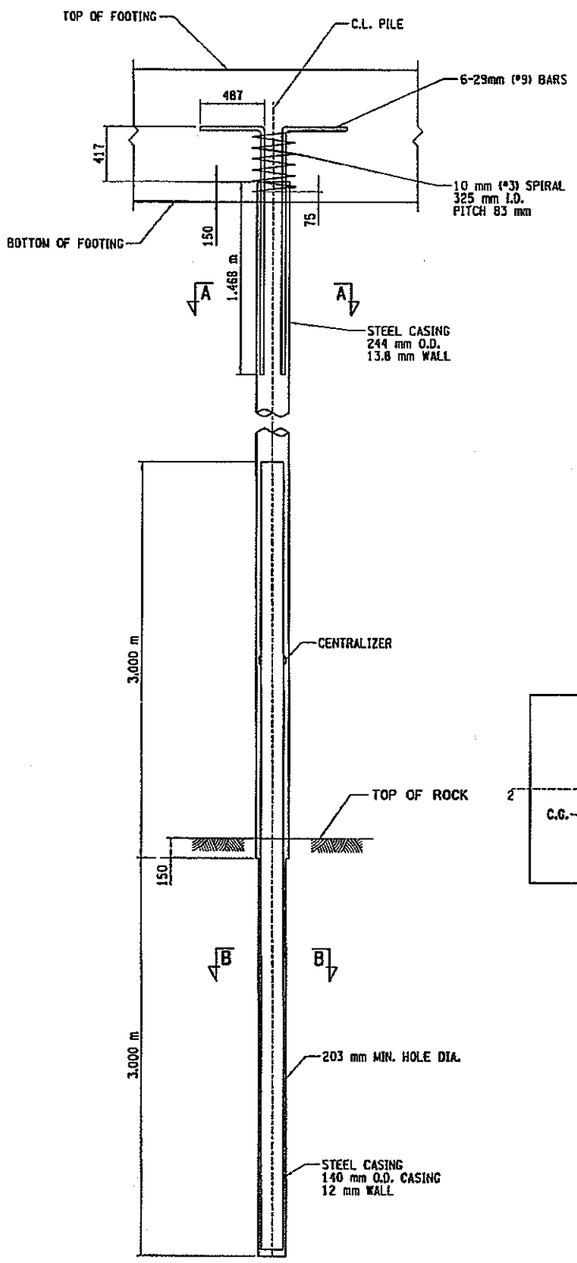
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-5	DEC. 2000	AS SHOWN	EARTH TECH

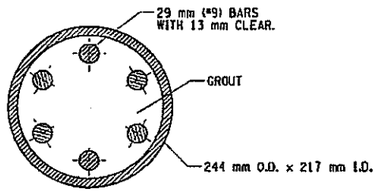
DESIGNED BY: N.S. CHECKED BY: A.K. ESTIMATED BY: J.N. CHECKED BY: J.M. DRAFTED BY: P.G. CHECKED BY: J.M. IN CHARGE OF: R.H.

PLOTTED BY:KHAN
PLOT DATE:12/8/00
L:\WORK\32822\CADD\INTREPID-BRIDGE\ODP\X032422FA-PL1
C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PARIVER.PLT

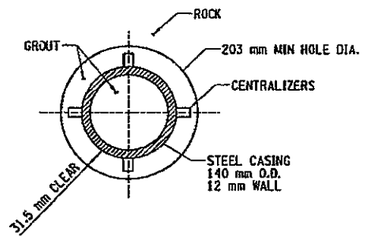
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	32A	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



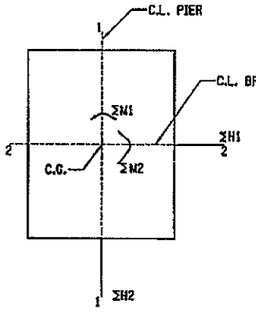
DETAIL OF BORED-IN PILE
SCALE 1:20



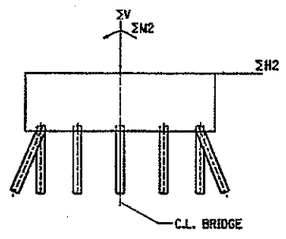
SECTION A-A
SCALE 1:4



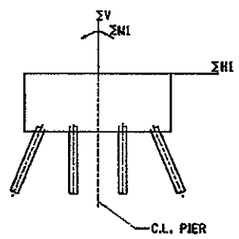
SECTION B-B
SCALE 1:4



PLAN



TRANSVERSE DIRECTION



LONGITUDINAL DIRECTION

LOCATION	VERTICAL DEAD LOAD ΣV (KN)	EQ (L) + 0.3 EQ (T)				EQ (T) + 0.3 EQ (L)			
		MOMENT (KN-M)		SHEAR (KN)		MOMENT (KN-M)		SHEAR (KN)	
		ΣM1	ΣM2	ΣH1	ΣH2	ΣM1	ΣM2	ΣH1	ΣH2
TOWER PIER (PIER 4)	1966	4735	814	974	112	1420	2708	292	373
PIER 3	390						1000		170
PIER 2	920	1829	655	313	112	548	2180	94	373
PIER 1	420	—	198	—	34	—	659	—	113

NOTE:
REDUCED SEISMIC LOAD SHOWN (R-FACTOR = 1 FOR TOWER PIER
R- FACTOR = 1.5 FOR PIER 3)

NOTES:

THE CONTRACTOR'S ENGINEER SHALL DISCOUNT SHAFT RESISTANCE IN THE SOIL AND MISCELLANEOUS FILL IN DETERMINATION OF THE BORED-IN PILE'S AXIAL CAPACITY.

BORED-IN PILES SHALL BE SOCKETED INTO ROCK. THE CONTRACTOR'S ENGINEER SHALL DESIGN THE BORED-IN PILES TO DEVELOP THE REQUIRED 1800 KN ULTIMATE AXIAL RESISTANCE FROM THE ROCK-GROUT BOND WITH SOCKET END BEARING DISCOUNTED.

PERMANENT CASING REQUIRED FOR BORED-IN PILES SHALL BE INSTALLED IN ACCORDANCE WITH ITEM 17551.4021 M - PERMANENT CASING FOR BORED-IN PILES.

A MINIMUM OF ONE DRILL RIG WILL BE REQUIRED TO INSTALLTHE BORED-IN PILES

ASSUMED TOP OF ROCK ELEVATIONS ARE AS FOLLOWS:

BORED-IN PILES FOUNDATION SCHEDULE			
LOCATION	ROCK SOCKET DEPTH	ESTIMATED ROCK ELEV.	ITEM NO.
PIER 4	± 3.0 m	-5.4 m	16551.9923M
PIER 3	± 3.0 m	-8.1 m	16551.9923M
PIER 2	± 3.0 m	-8.6 m	16551.9923M
PIER 1	± 3.0 m	-9.7 m	16551.9923M

THE FINAL TOP OF ROCK AND TOP OF SOCKET ELEVATIONS AT EACH SUBSTRUCTURE WILL BE DETERMINED BY AN ENGINEERING GEOLOGIST FROM THE GEOTECHNICAL ENGINEERING BUREAU DURING INSTALLATION OF THE BORED-IN PILES

THE CONTRACTORS ENGINEER SHALL CONSIDER TENSION, COMPRESSION AND HORIZONTAL LOADS IN THE STRUCTURAL DESIGN OF THE BORED-IN PILES. DUE TO SOIL LIQUEFACTION POTENTIAL FROM A SEISMIC EVENT ASSUME A SOIL SHEAR STRENGTH OF TWENTY (20) PERCENT OF THE STATIC STRENGTH FOR LATERAL SUPPORTS OF PILES

NOTE: THIS WORK
NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

FOUNDATION DETAILS
WEST APPROACH AND MAIN SPANS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

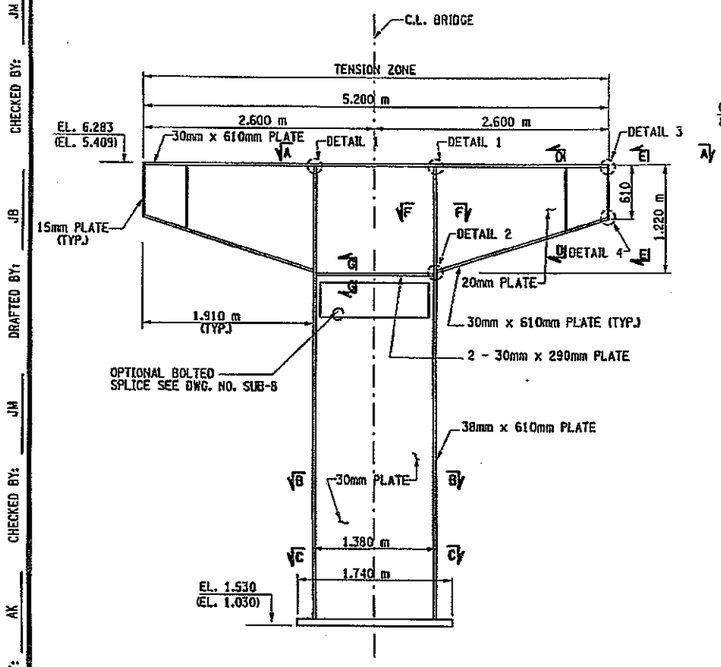
DWG. NO.	DATE	SCALE
SUB-5	FEB. 2000	AS NOTED

HARZA TECH

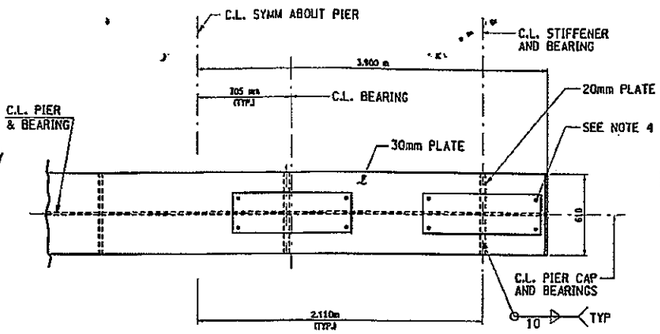
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IN CHARGE OF: N.S. DESIGNED BY: J.B./R.H. CHECKED BY: J.M.
D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT
L:\WORK\32822\CADD\INTREPID-BRIDGE\ADP\X02422CA.P1J
12/21/2000
JMATARAZZO

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	33F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

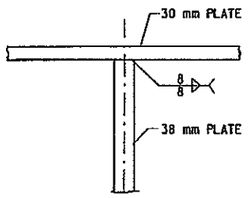
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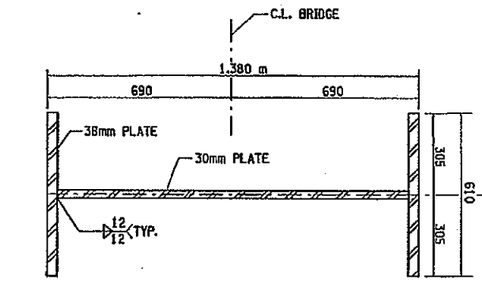
ELEVATION OF PIERS 1 & 2 (LOOKING WEST)
SCALE=1:30
ELEVATION INSIDE ( ) FOR PIER 1



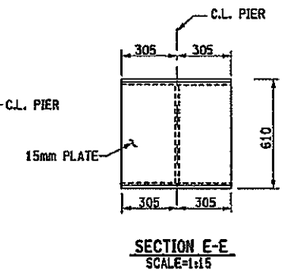
SECTION A-A - PARTIAL PLAN OF PIER TOP
SCALE=1:20



DETAIL 1
SCALE=1:5



SECTION B-B - TYPICAL CROSS SECTION OF PIER COLUMN
SCALE=1:10



SECTION E-E
SCALE=1:15

NOTE:

1. FOR DETAILS 3 AND 4 AND SECTION G-G AND SECTION F-F SEE DWG NO. SUB-8
2. ALL WORK SHOWN ON THIS DRAWING IS PAID UNDER ITEM 564.0501M
3. ALL STRUCTURAL STEEL SHALL BE PAINTED. ITEM 572.010001M
4. FOR BEARINGS SEE DWG. NO. SSD-20

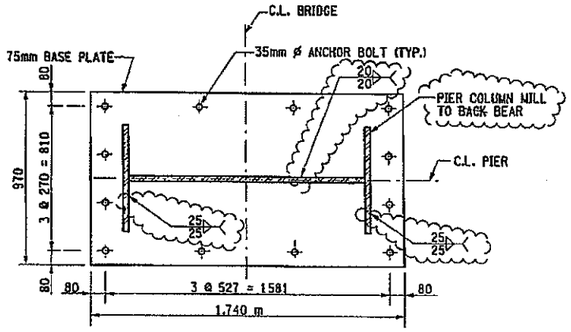
FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 33. THESE SIGNATURES APPROVE SHEET NOS. 33F1, 34F1, 86F1, 88F1, 88F2, 88F3, 88F4, 90F1, 92F1, 92F2, 93F1, 94F1, 99F1, 100F1 & 102F1

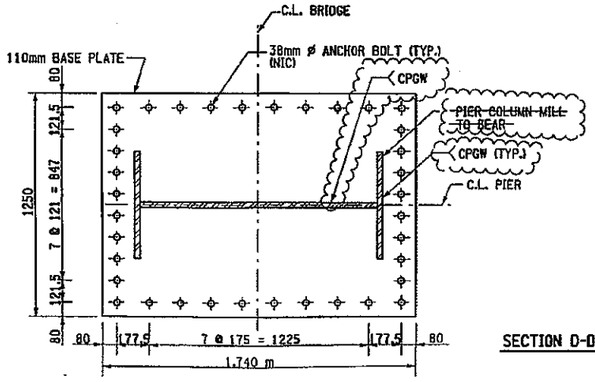
APPROVED
DATE: Nov. 14, 2001
Jack J. Hartheim
DEPUTY CHIEF ENGINEER (STRUCTURES)

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
APPROVED DATE: 11-16-01
JAMES F. TYNAN, P.E. ACTING IN HIS CAPACITY AS DEPUTY CHIEF ENGINEER (CONSTRUCTION)

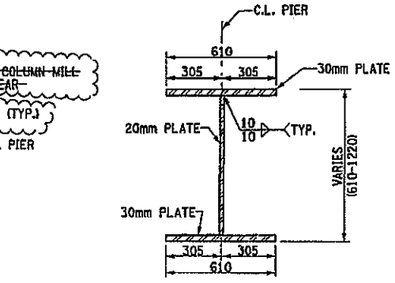
DENOTES REVISIONS



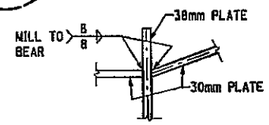
SECTION C-C - COLUMN BASE PLATE, PIER 1
SCALE=1:15



SECTION C-C - COLUMN BASE PLATE, PIER 2
SCALE=1:15



SECTION D-D - TYPICAL CROSS SECTION OF CANTILEVER BEAM
SCALE=1:15



DETAIL 2
SCALE=1:10

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH - PIERS 1&2
DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-7	OCT. 2001	AS SHOWN	EARTH TECH

SCHEMA3A
L:\CAD\C14G29D-GADD\FIELD CHANGE SHEETS\F1 FLDCHANGES\SHEET_33.DGN
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

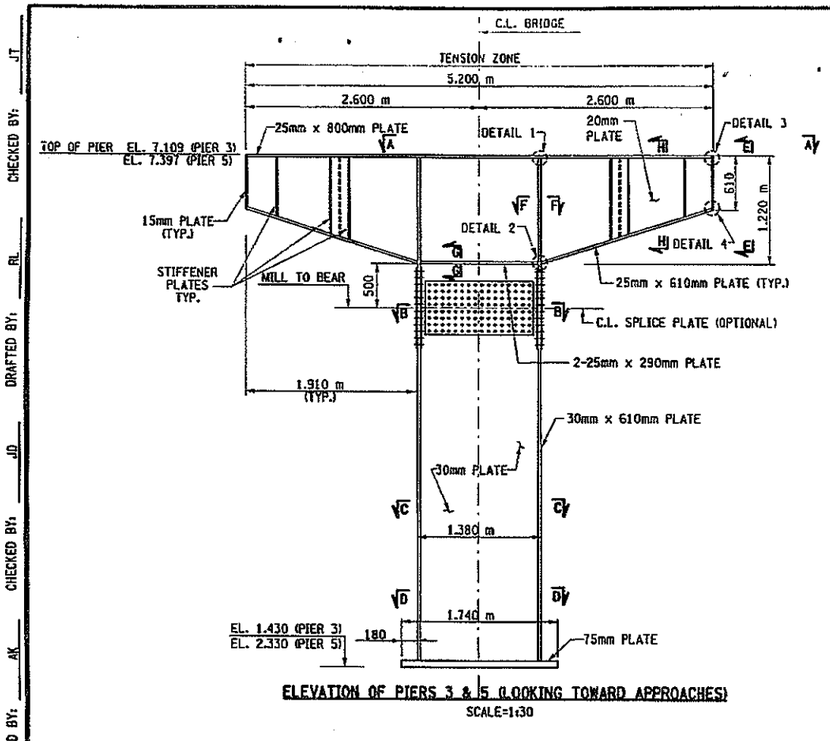
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	34F1	142

ROUTE 9A RECONSTRUCTION PROJECT

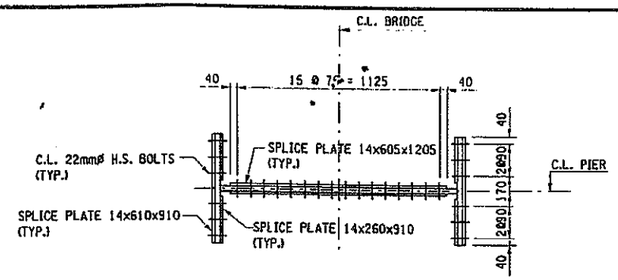
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

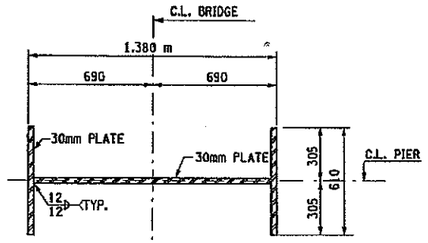
NEW YORK COUNTY PIN: X024.22



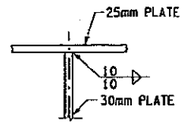
ELEVATION OF PIERS 3 & 5 (LOOKING TOWARD APPROACHES)
SCALE=1:30



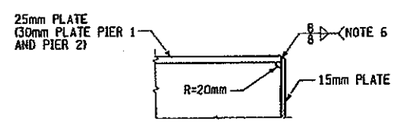
SECTION B-B - TYPICAL CROSS SECTION OF SPLICE
SCALE=1:15



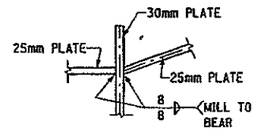
SECTION C-C - TYPICAL CROSS SECTION OF PIER COLUMN
SCALE=1:15



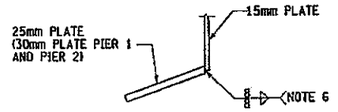
DETAIL 1
SCALE=1:10



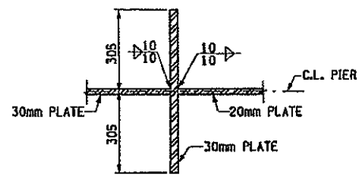
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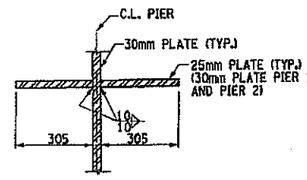
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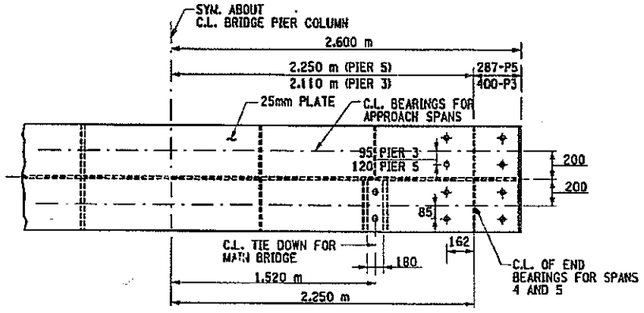
DETAIL 4
SCALE=1:10



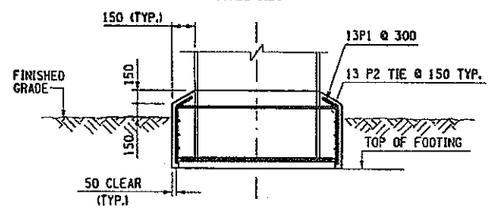
SECTION F-F
SCALE=1:10



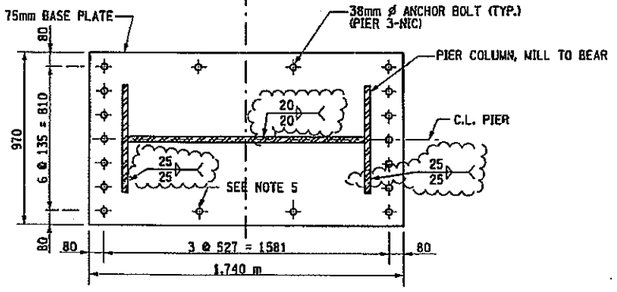
SECTION G-G
SCALE=1:10



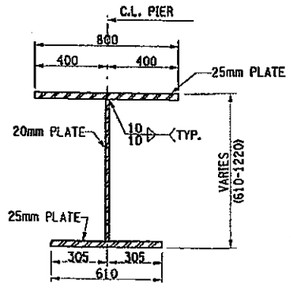
SECTION A-A - PARTIAL PLAN OF PIER TOP
SCALE=1:20



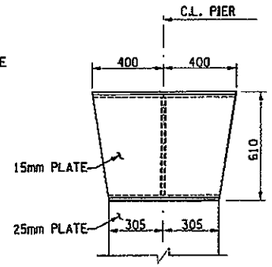
CONCRETE PROTECTION AT PIERS 1,2,3, AND 5
ITEM 555.0105 M
ITEM 556.0201 M
SCALE=1:30



SECTION D-D - COLUMN BASE PLATE
SCALE=1:15



SECTION H-H - TYPICAL CROSS SECTION OF PIER CAP
SCALE=1:15



SECTION E-E
SCALE=1:15

NOTE:
1. FOR NOTES SEE DWG. NO. SUB-7
2. FOR BEARINGS SEE DWG. NOS. SSD 20 & 21 & TD-19
3. FOR PIER CAP STIFFENER PLATE DETAIL - SEE DWG. NO. SSD-3
4. FOR TIE-DOWN DETAIL SEE DWG NO.SSD-3
5. ACTUAL BOLT SPACING VARIES AT PIER 3 DUE TO EXISTING UTILITY DUCT INTERFERENCE. REFER TO GENERAL NOTE NO. 102
6. GRIND THE OUTER FILLET

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 34.
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES.

DENOTES REVISIONS

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
END PIERS (PIERS 3 AND 5) ELEVATION, DETAILS AND SECTIONS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-8	OCT. 2001	AS SHOWN	EARTH TECH

JT CHECKED BY:
RL DRAFTED BY:
JD CHECKED BY:
AK ESTIMATED BY:
JM CHECKED BY:
RH DESIGNED BY:
NS IN CHARGE OF:

SCHANDA
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L:\GENERAL\PLOTDRV\NYS DOT\WYSDOT11X17.PLT

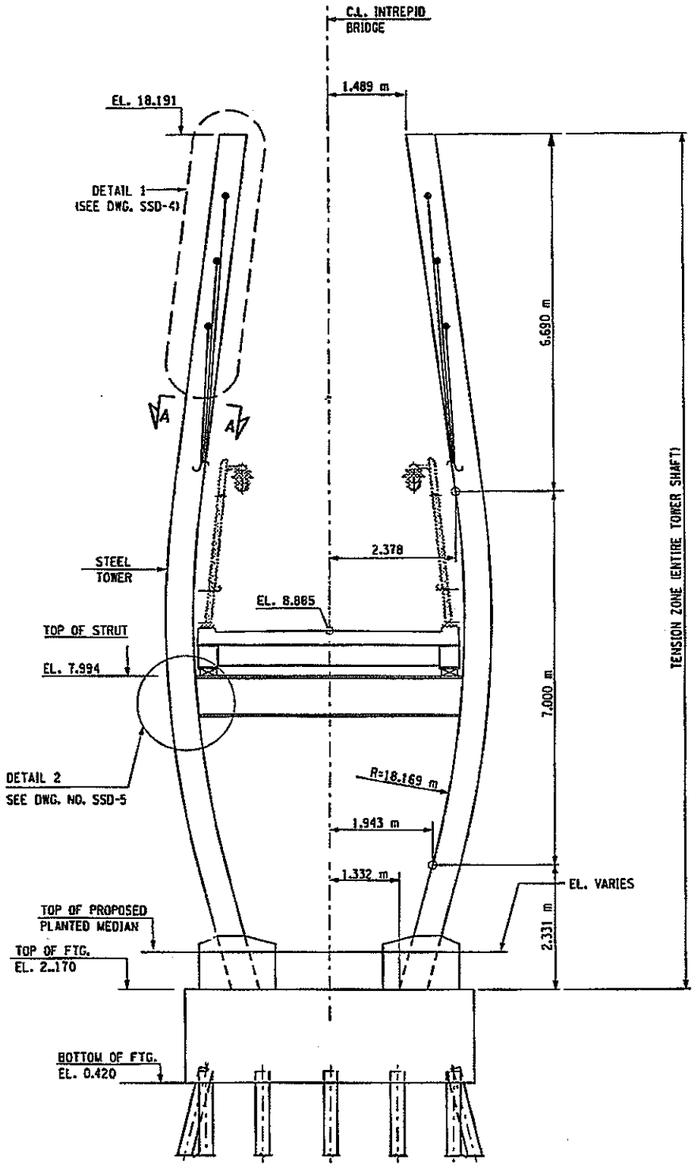
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	35	142

ROUTE 9A RECONSTRUCTION PROJECT

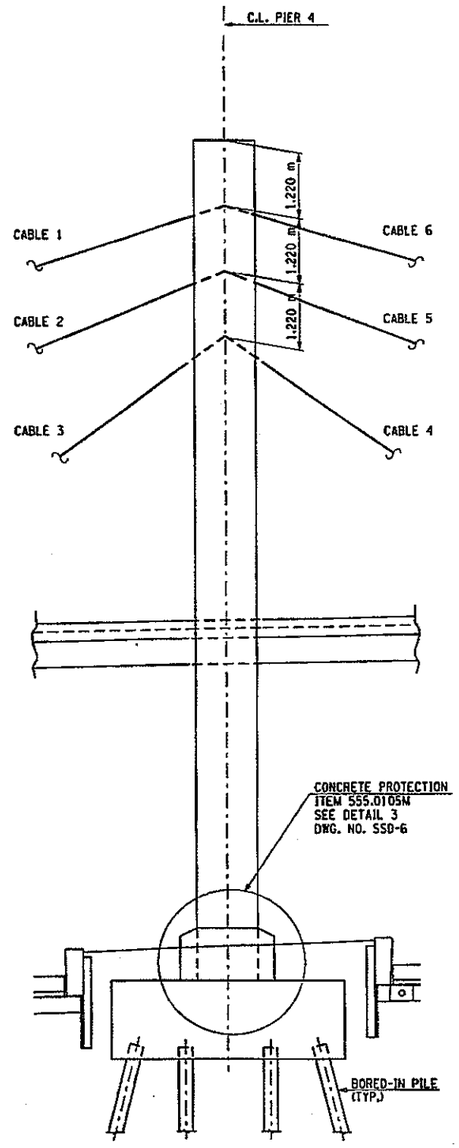
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

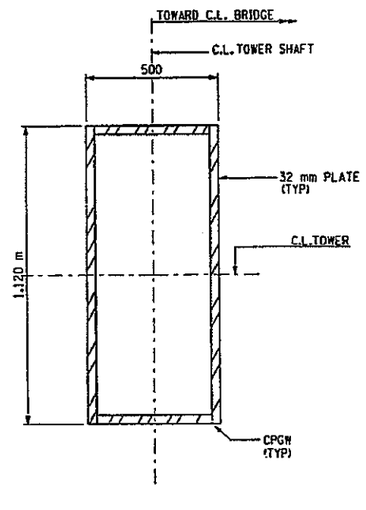
NEW YORK COUNTY PIN: X024.22



TRANSVERSE SECTION
SCALE= 1:50



LONGITUDINAL ELEVATION
SCALE= 1:50



SECTION A-A - TYPICAL CROSS SECTION OF TOWER SHAFT
(EXCEPT FOR TOWER TOP)
SCALE= 1:10

NOTES:

1. FOR TOWER DETAILS SEE DWG. NOS. SSD-4 TO SSD-6
2. ALL STRUCTURAL STEEL FOR THE TOWER INCLUDING STRUT, SHALL BE PAID UNDER ITEM 564.0502M ALL OTHER STEEL FOR SPANS 4&5 SHALL BE PAID UNDER ITEM 564.0503M UNLESS NOTED OTHRWISE.
3. STEEL FOR TOWER SHAFT AND INTERNAL COMPONENTS SHALL BE ASTM A709 GR 345W. CONNECTION MATERIAL FOR TOWER STRUT SHALL BE GRADE 345 OR 345W.
4. ALL EXTERIOR SURFACES OF THE TOWER INCLUDING THE PORTION TO BE ENCASED IN CONCRETE AND, THE TOP AND SIDES OF THE BASE PLATE SHALL BE PAINTED UNDER ITEM 16572.03M.
5. NO SPLICES SHALL BE PERMITTED IN THE TOWER LEGS.

NOTE: ANCHOR BOLTS, FOOTINGS AND PILES NOT-IN-CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
TOWER (PIER 4) ELEVATION AND SECTIONS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SUB-9	DEC. 2000	AS SHOWN	EARTH TECH

JM DRAFTED BY: JD CHECKED BY: AK ESTIMATED BY: JM CHECKED BY: RH DESIGNED BY: NS IN CHARGE OF:

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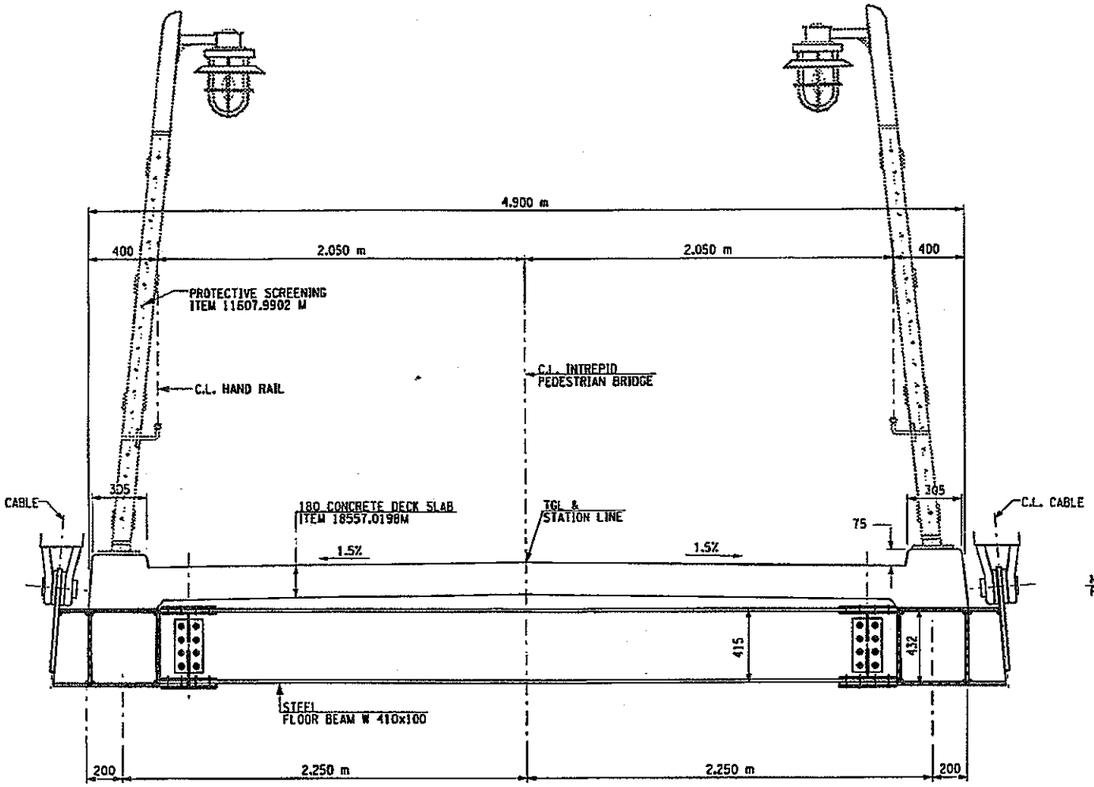
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	36	142

ROUTE 9A RECONSTRUCTION PROJECT

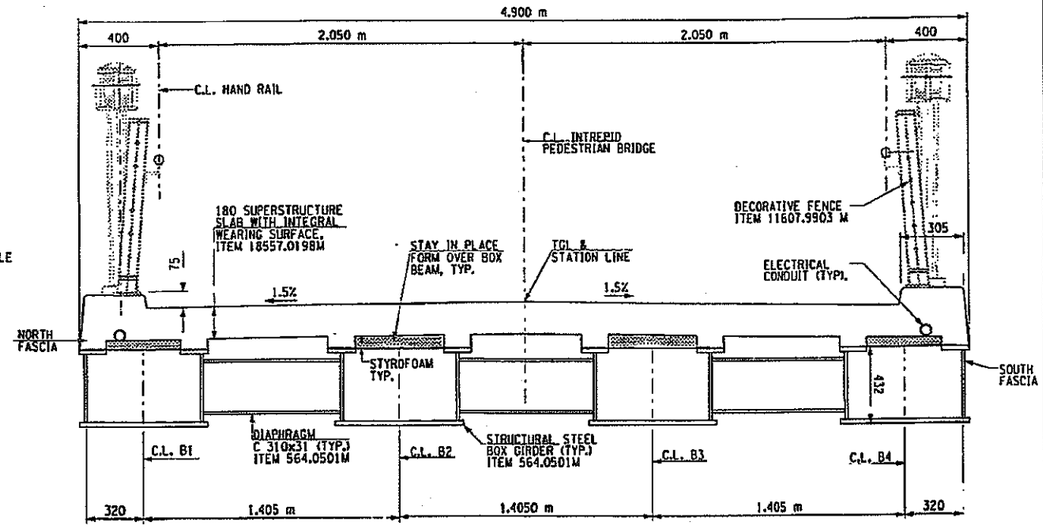
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



MAINSPAN



WEST APPROACH

NOTES

1. FOR NOTES SEE DWG. NO. SUB-9
2. FOR SUPESTRUCTURE DETAIL SEE DWG. NOS. SSD-2 TO SSD-24
3. FOR RAILING DETAILS SEE DWG. NOS R1-R4
4. FOR ADDITIONAL NOTES SEE DWG. NO. SUB-9
5. FOR LIGHTING DETAILS SEE DWG. NO. L-7

AS-BUILT REVISIONS

SIGNATURE DATE

TYPICAL SECTIONS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-1	DEC. 2000	1:15	EARTH TECH

DESIGNED BY: JDVH CHECKED BY: JH ESTIMATED BY: NS IN CHARGE OF: RL DRAFTED BY: JM CHECKED BY:

JMATARAZZO
BI/2456/2001
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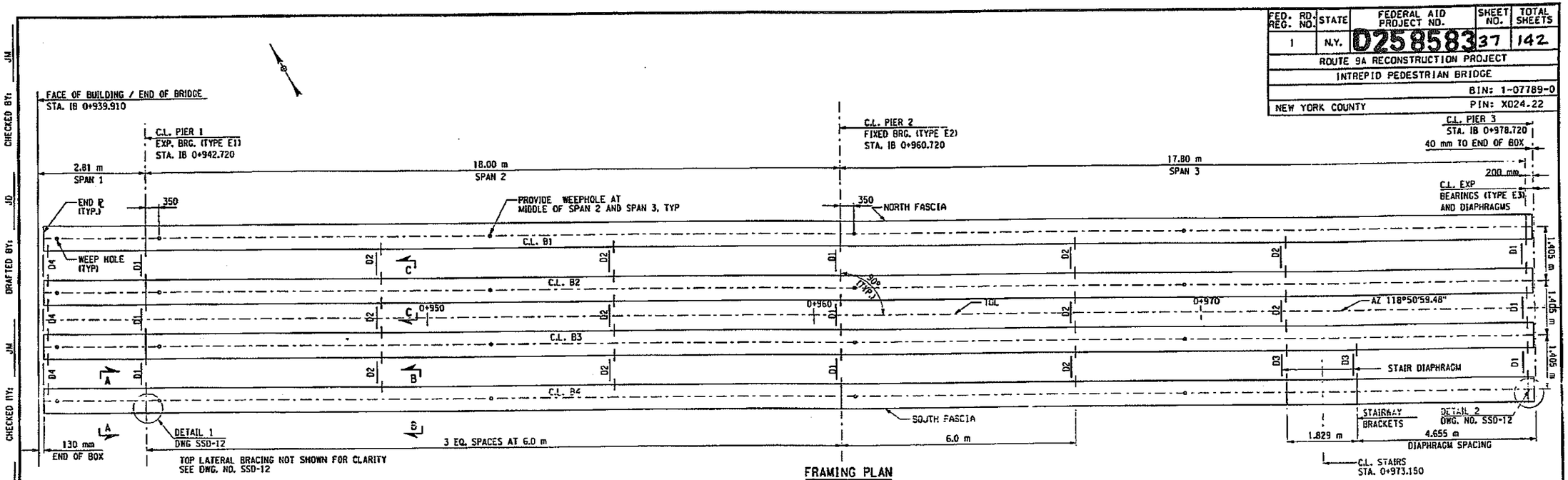
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	37	142

ROUTE 9A RECONSTRUCTION PROJECT

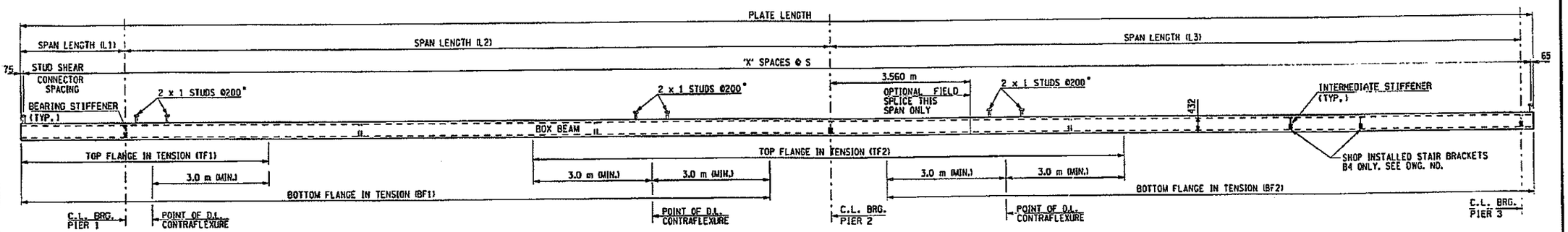
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



FRAMING PLAN
SCALE: 1:50



* ADDITIONAL SHEAR CONNECTORS PROVIDED AT POINT OF D.L. CONTRAFLEXURE

GIRDER ELEVATION
SCALE: 1:50

DIAPHRAGM TABLE	
NO.	TYPE
D1	W410X100
D2	C310X31
D3	C310X31
D4	C310X31

GIRDER SCHEDULE											
BEAM NO.	SPAN LENGTH L1 (m)	SPAN LENGTH L2 (m)	SPAN LENGTH L3 (m)	FLANGE IN TENSION BF1 (m)	FLANGE IN TENSION BF2 (m)	FLANGE IN TENSION TF1 (m)	FLANGE IN TENSION TF2 (m)	PLATE LENGTH (m)	SHEAR CONNECTORS		
									SPACES 'X'	SPACING 'S' (mm)	TOTAL STUDS
B1	2.810	18.000	17.800	16.240	16.410	6.500	15.000	38.640	64	600	142
B2	2.810	18.000	17.800	16.250	16.420	6.580	14.980	38.640	64	600	142
B3	2.810	18.000	17.800	16.250	16.420	6.580	14.980	38.640	64	600	142
B4	2.810	18.000	17.800	16.240	16.410	6.500	15.000	38.640	64	600	142

NOTES:

1. ALL STRUCTURAL STEEL FOR SPANS 1 THROUGH 3 SHALL BE A709 GRADE 345. COST FOR STEEL TO BE PAID FOR UNDER ITEM 564.0501M
2. ALL STRUCTURAL STEEL SHALL BE COMPLETELY PAINTED. COST FOR PAINTING TO BE PAID FOR UNDER ITEM 572.010001M SEE NOTE 4 DWG. NO. SUB-9
3. LONGITUDINAL DIMENSIONS SHOWN ARE HORIZONTAL DIMENSIONS ALONG C.L. GIRDER AND REQUIRE ADJUSTMENTS FOR CAMBER AND FINISH GRADE.
4. BEARING STIFFENERS SHALL BE INSTALLED TO BE VERTICAL UNDER FULL DEAD LOAD.
5. ENDS OF GIRDERS SHALL BE FABRICATED SO THAT UNDER FULL DEAD LOAD THE ENDS ARE VERTICAL.
6. STIFFENERS AND DIAPHRAGM CONNECTION PLATES SHALL BE INSTALLED NORMAL TO THE GIRDER WEB AND FLANGES.
7. COST OF STUD SHEAR CONNECTOR TO BE PAID FOR UNDER ITEM 556.03M
8. ALL UNITS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

REFERENCES:

1. FOR PLAN VIEW OF EXPANSION JOINT AT PIER 3, SEE DWG. NO. SSD-24.
2. FOR SECTIONS A-A, B-B, & C-C SEE DWG. SSD-12.

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
FRAMING PLAN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-2	DEC. 2000	AS SHOWN	EARTH TECH

CHECKED BY: JM
DRAFTED BY: JD
CHECKED BY: JM
CHECKED BY: AR
ESTIMATED BY: JD/JB
CHECKED BY: JB/JD
DESIGNED BY: NS
IN CHARGE OF:

JM/TP/02/20
01/19/2001
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DS VERTICAL WORKSPACE\SYSTEM\LOCAL\PRINTER.PLT

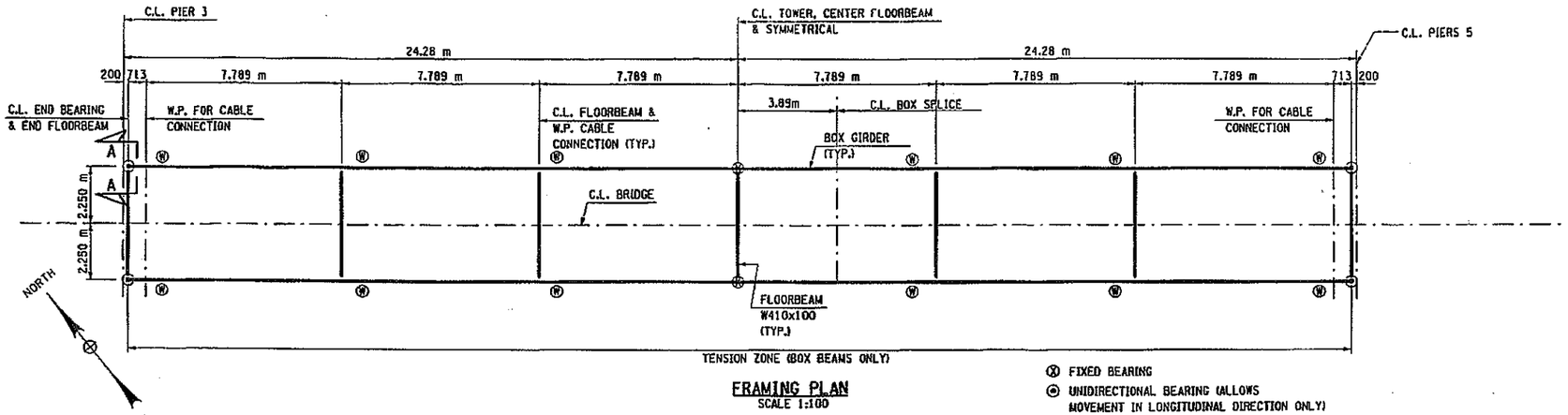
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	38	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

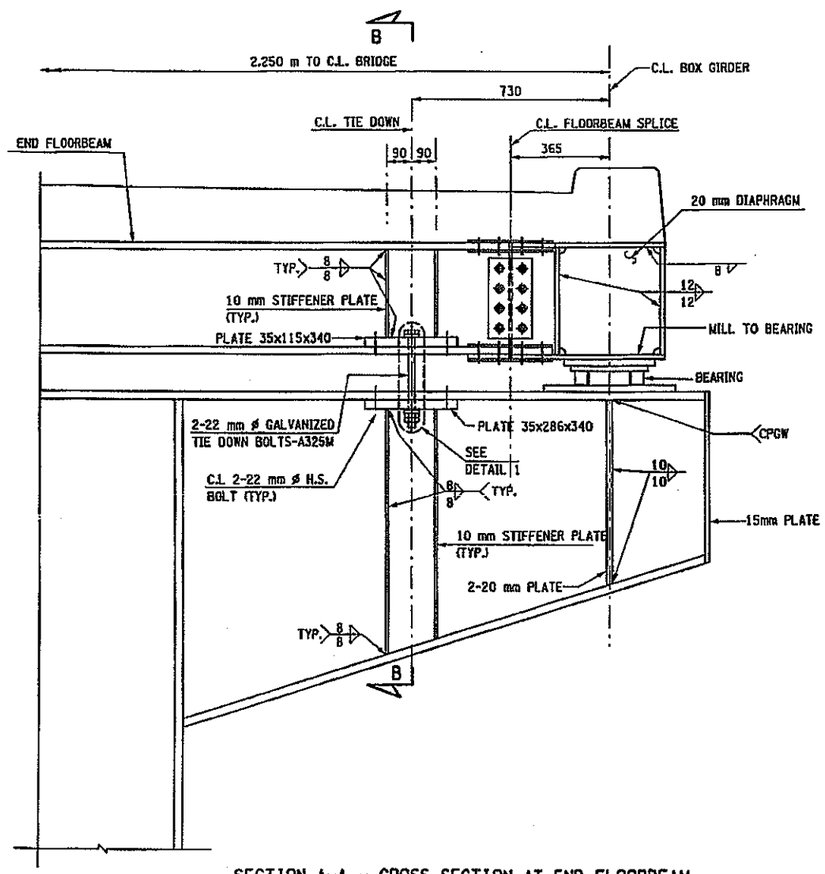


FRAMING PLAN
SCALE 1:100

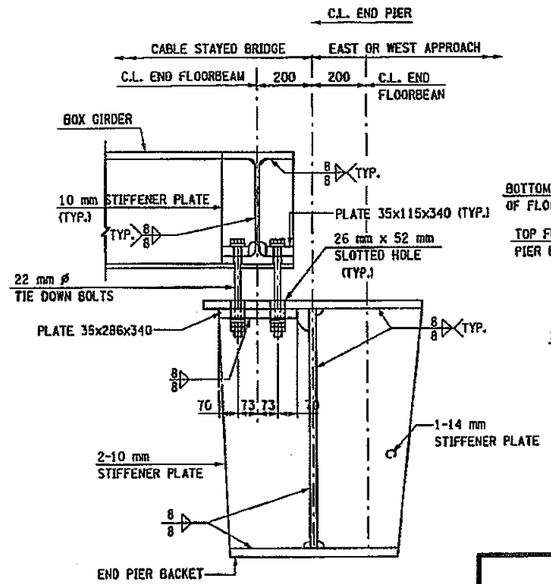
⊗ FIXED BEARING
⊙ UNIDIRECTIONAL BEARING (ALLOWS MOVEMENT IN LONGITUDINAL DIRECTION ONLY)
Ⓦ WEEPHOLE, SEE DWG. NOS SSD-7 AND SSD-8

NOTES:

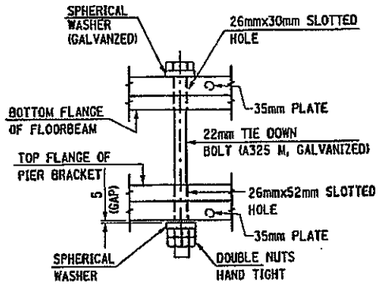
1. ALL STRUCTURAL STEEL FOR SUPERSTRUCTURE INCLUDING TIE DOWN BOLTS - ITEM 564.0503 M
2. FOR NOTES SEE DWG NO. SUB-9
3. FOR BOX BEAM DETAILS SEE DWG. NO. SSD-7
4. FOR BOX BEAM SPLICES SEE DWG. NO. SSD-10
5. FOR BEARING DETAILS SEE DWG. NO. SSD - 21



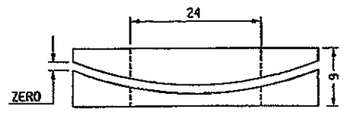
SECTION A-A - CROSS SECTION AT END FLOORBEAM
SCALE 1:10



SECTION B-B
SCALE 1:10



DETAIL 1
BOX BEAM TIE DOWN
SCALE 1:5



SPHERICAL WASHER DETAIL
SCALE 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
FRAMING PLAN & TIE DOWN DETAILS AT END FLOORBEAMS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-3	DEC. 2000	AS SHOWN	EARTH TECH

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DRAWN BY: RH
CHECKED BY: JM
ESTIMATED BY: AK
CHECKED BY: JD
DRAFTED BY: PG
CHECKED BY: JM
IN CHARGE OF:

PLOTTED: 12-MAR-2001 08:50
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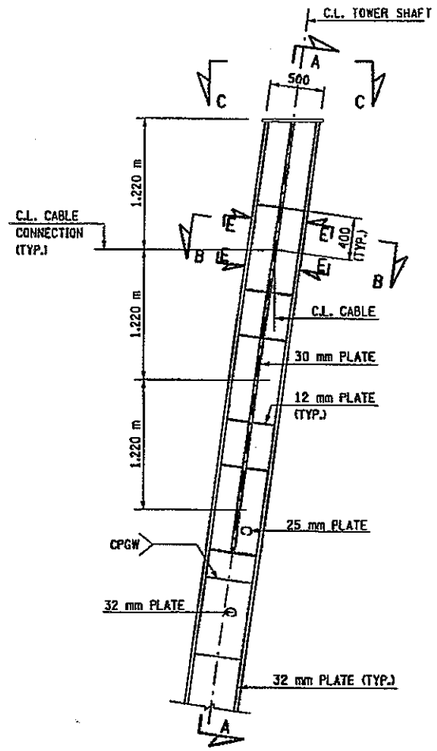
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	39	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

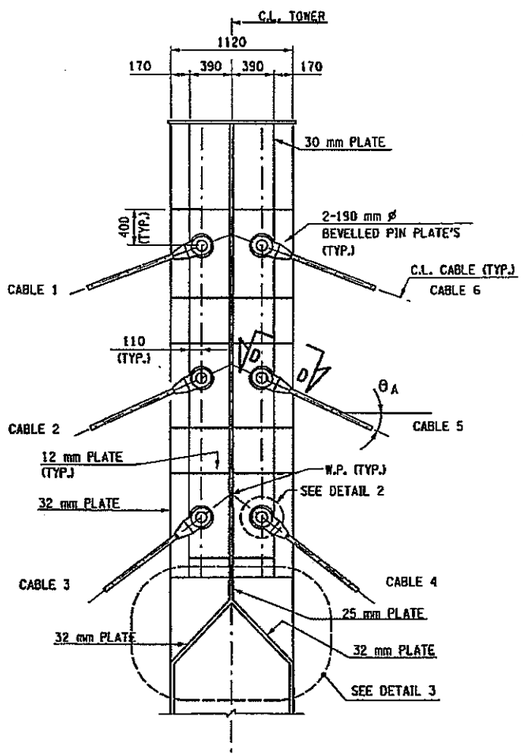
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



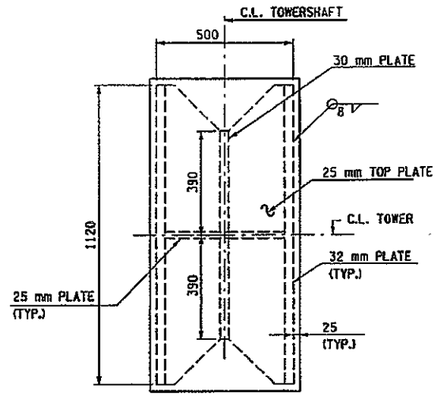
DETAIL 1- ELEVATION OF TOWER TOP

SCALE 1:25



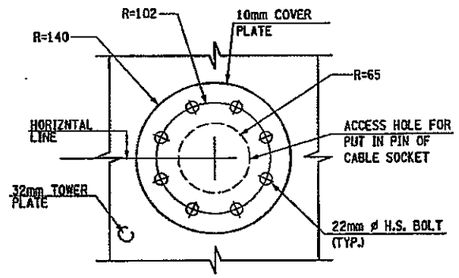
SECTION A-A

SCALE 1:25



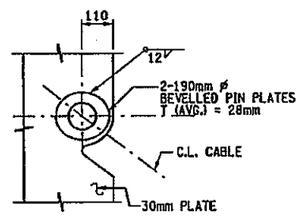
SECTION C-C

SCALE 1:10



VIEW E-E - TYP. VIEW OF ACCESS HOLE FOR CABLE SOCKET PINS AND COVER PLATE

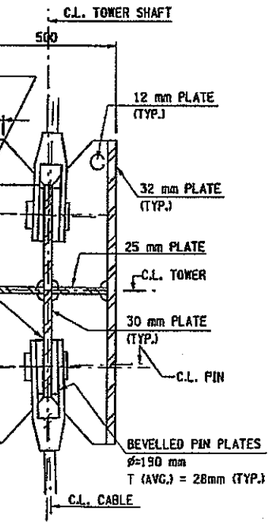
SCALE 1:5



NOTE: CABLE SOCKET NOT SHOWN FOR CLARITY

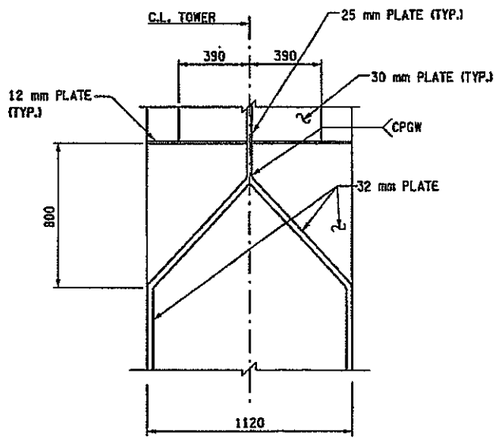
DETAIL 2-TYP TOWER CONNECTION PLATES

SCALE 1:10



SECTION B-B

SCALE 1:10



DETAIL 3

SCALE 1:15

NOTE:

1. FOR SECTION D-D SEE DWG. SSD-11
2. FOR θ_A SEE TABLE ON DWG. SSD-11
3. FOR ADDITIONAL NOTES SEE DWG. NO. SUB-9
4. CABLES, SOCKETS, PINS, PIN PLATES, AND FILL PLATES ARE PAID UNDER ITEM 11564.99 M.

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
TOWER (PIER 4) DETAIL-1

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-4	DEC. 2000	AS SHOWN	

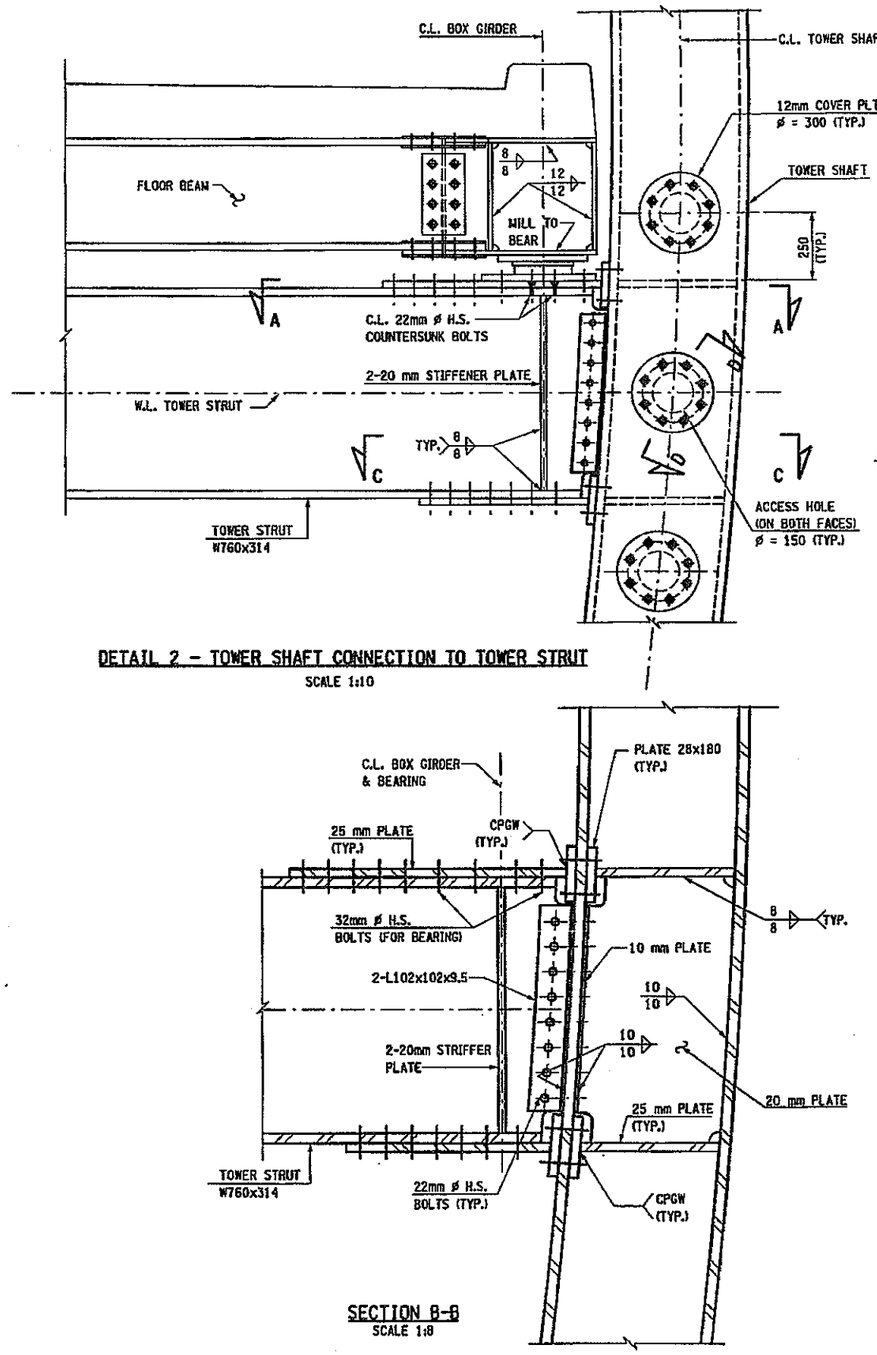
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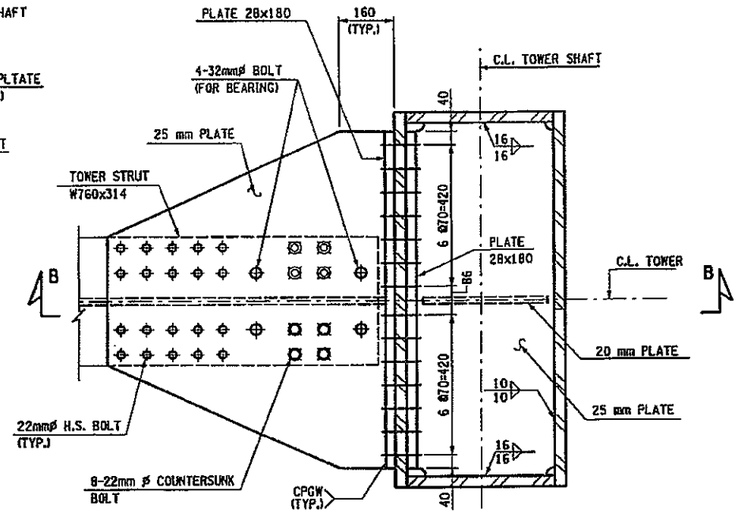
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	40	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

NOTES

1. 50% OF THE CORNER CPG WELDS SHALL BE ULTRASONICALLY TESTED BY A NYSDOT CERTIFIED TECHNICIAN. THE COST IS TO BE INCLUDED IN THE STRUCTURAL STEEL ITEM
2. THE CONNECTION SHOWN SHALL BE ASSEMBLED IN ACCORDANCE WITH SECTION 1105 OF THE SCM.
3. FOR ADDITIONAL NOTES SEE DWG. NO. SUB-9

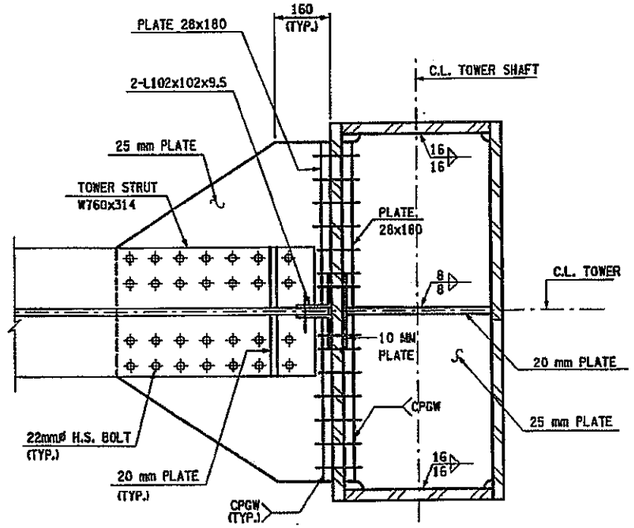


DETAIL 2 - TOWER SHAFT CONNECTION TO TOWER STRUT
SCALE 1:10



SECTION A-A
SCALE 1:8

SECTION B-B
SCALE 1:8



SECTION C-C
SCALE 1:8

SECTION D-D
SCALE 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
TOWER (PIER 4) DETAIL- 2

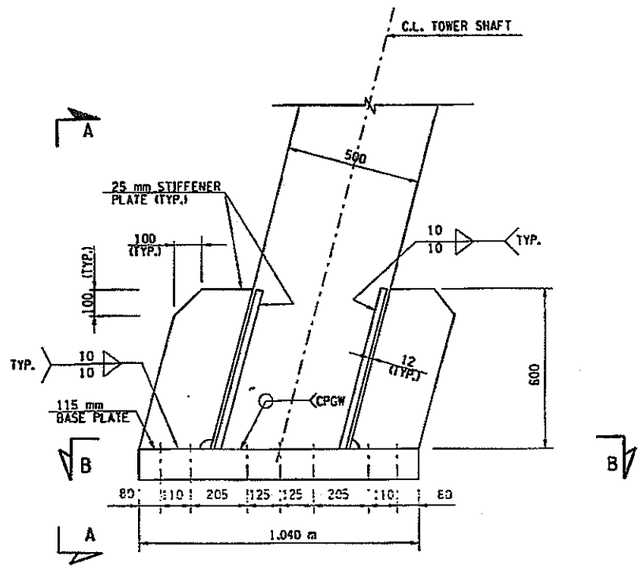
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-5	DEC. 2000	AS SHOWN	EARTH TECH

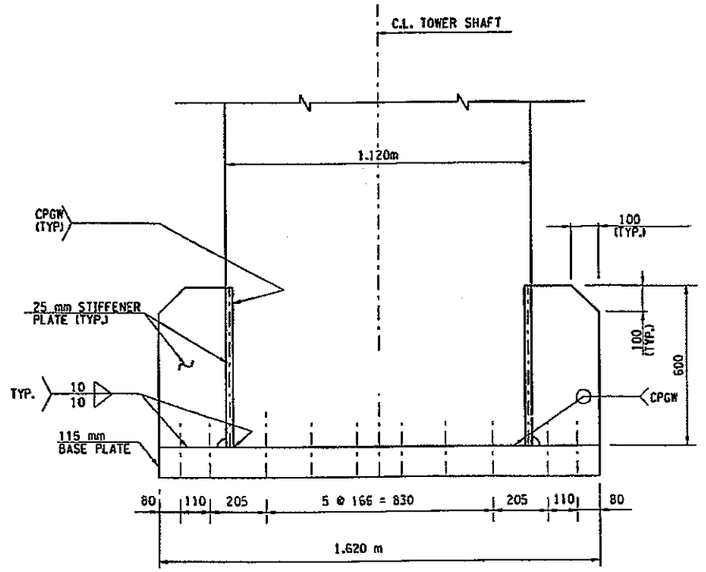
DESIGNED BY: NS CHECKED BY: RH DRAFTED BY: JD CHECKED BY: DCPG ESTIMATED BY: JM IN CHARGE OF: AK

BJORKMAN
Feb 07, 2008
L:\WORK\3822\CADD\INTREPID-BRIDGE\dgn\X024222CA.SLE
G:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583 41		142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



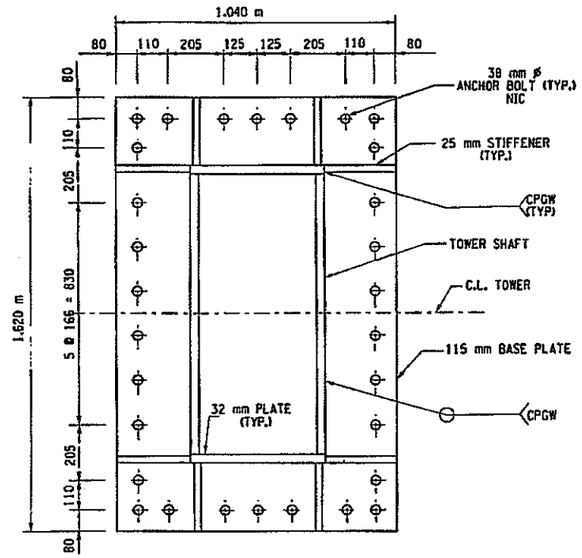
DETAIL 3 - ELEVATION OF TOWER BASE
SCALE 1:10



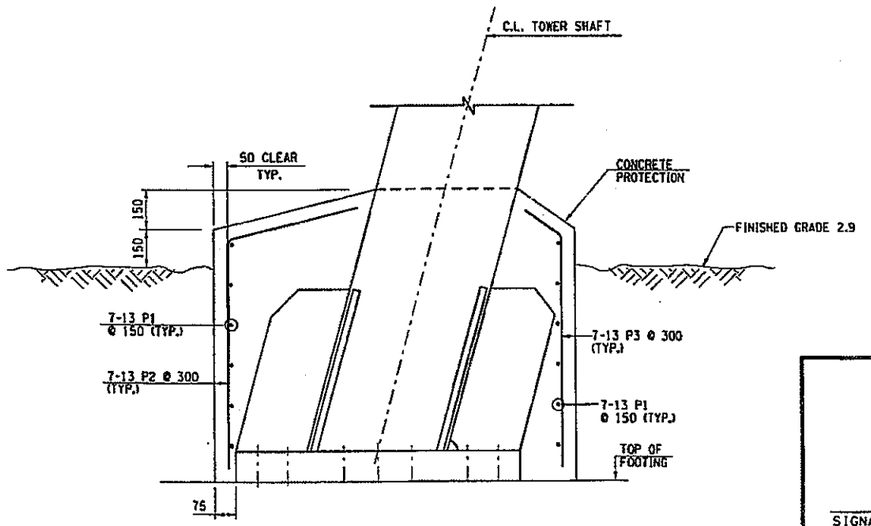
SECTION A-A
SCALE 1:10

NOTES

1. FOR BAR LIST SEE DWG. NO. BL-2
2. FOR ADDITIONAL NOTES SEE DWG. NO. SUB-9



SECTION B-B
SCALE 1:10



CONCRETE PROTECTION OF TOWER BASE
SCALE 1:10

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
TOWER (PIER 4) DETAIL-3

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-6	DEC. 2000	1:10	EARTHTECH

JB CHECKED BY:
DC DRAFTED BY:
JD CHECKED BY:
AK ESTIMATED BY:
JM CHECKED BY:
RH DESIGNED BY:
NS IN CHARGE OF:

JMOTARAZZO
01/24/2001
D:\MEWL\FAGANSPACE\STS\EXHIBIT\INTREPID-PED\INTREPID-PED-MAIN-TOWER-DETAIL.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	42	142

ROUTE 9A RECONSTRUCTION PROJECT

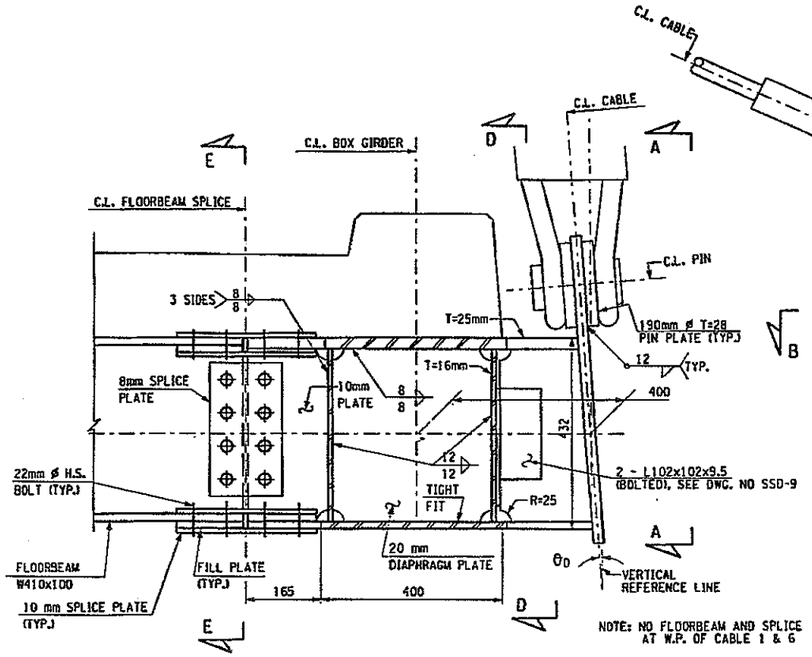
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

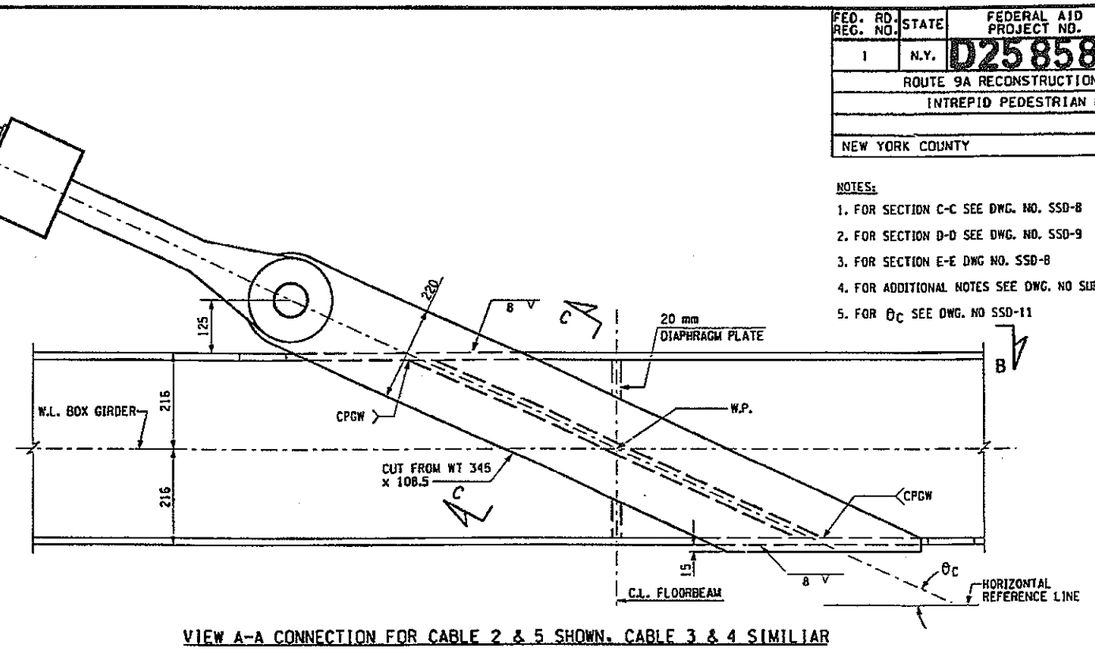
NEW YORK COUNTY PIN: X024.22

NOTES:

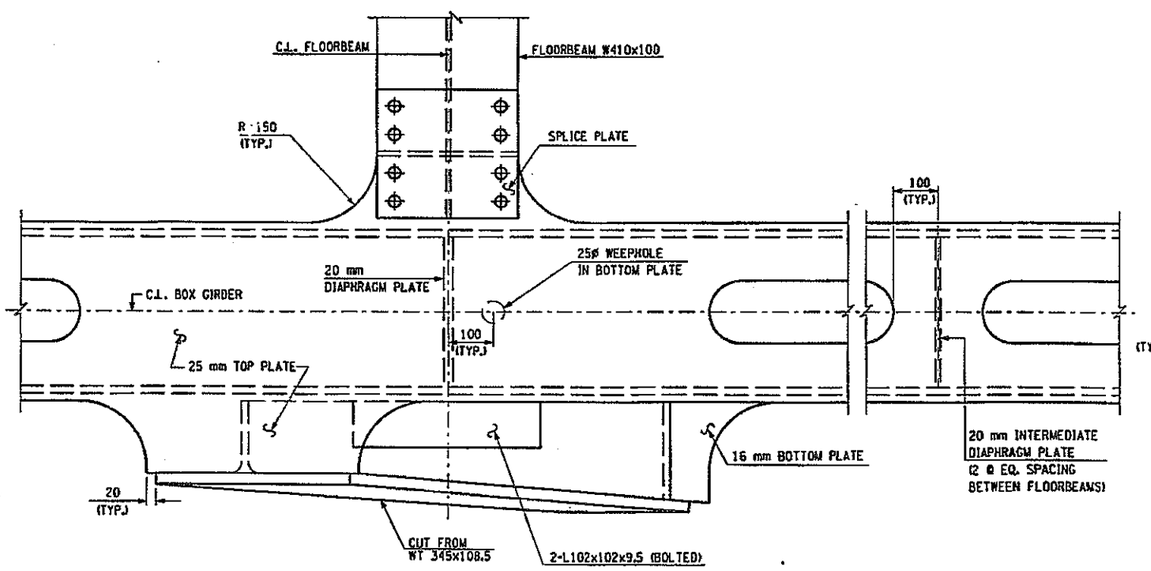
1. FOR SECTION C-C SEE DWG. NO. SSD-8
2. FOR SECTION D-D SEE DWG. NO. SSD-9
3. FOR SECTION E-E DWG NO. SSD-8
4. FOR ADDITIONAL NOTES SEE DWG. NO SUB-9
5. FOR θ_C SEE DWG. NO SSD-11



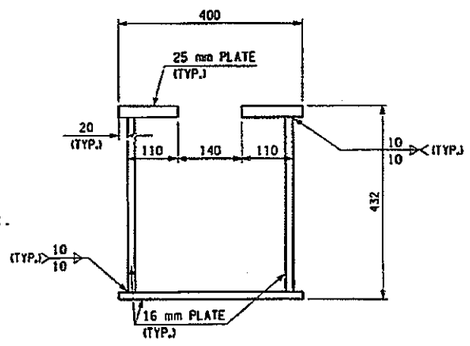
DETAIL 1 TYPICAL CABLE CONNECTION TO BOX GIRDER & FLOORBEAM



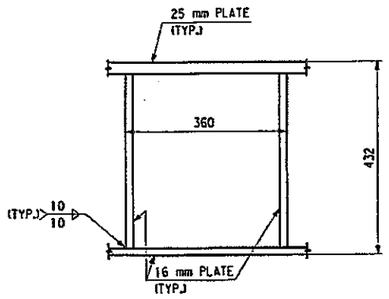
VIEW A-A CONNECTION FOR CABLE 2 & 5 SHOWN, CABLE 3 & 4 SIMILIAR



VIEW B-B



TYPICAL CROSS SECTION OF BOX GIRDER



CROSS SECTION OF BOX GIRDER AT CABLE & FLOOR BEAM CONNECTION POINTS

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN

CABLE ANCHORAGE DETAIL AT BOX GIRDER-1

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-7	DEC. 2000	1:6	EARTH TECH

JM DC RH NS

CHECKED BY: JM

DRAFTED BY: DC

CHECKED BY:

ESTIMATED BY:

CHECKED BY:

DESIGNED BY:

IN CHARGE OF:

JM01AR2720
D:\Projects\D258323\CADD\INTREPID-BRIDGE\ADP\V03422CA.SIF
D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT

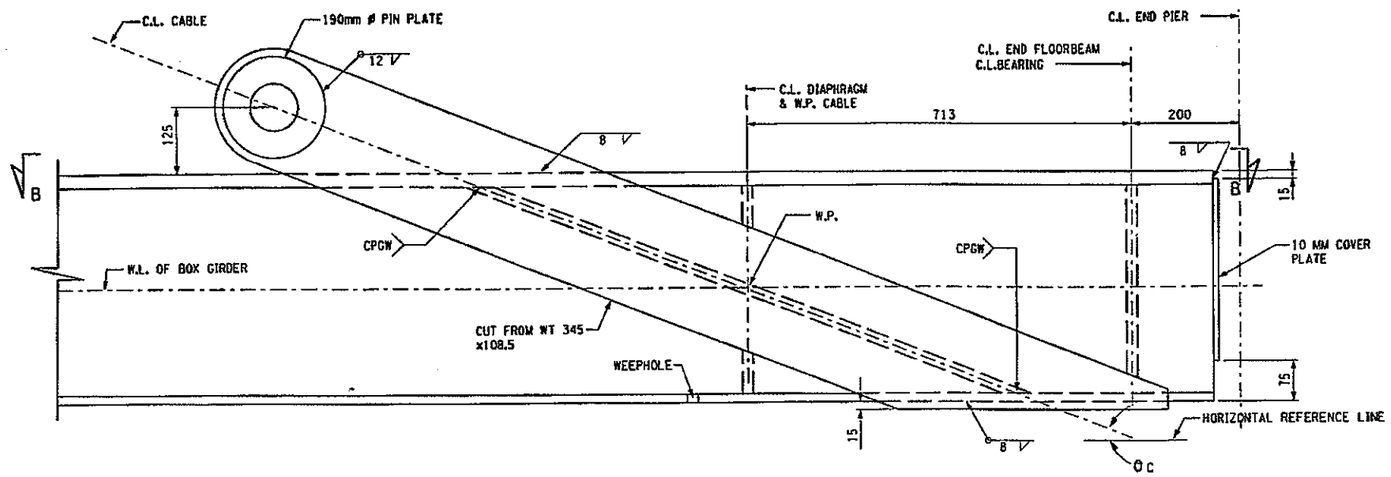
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	43	142

ROUTE 9A RECONSTRUCTION PROJECT

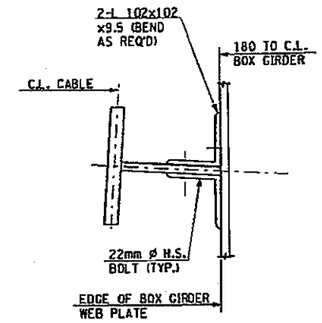
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

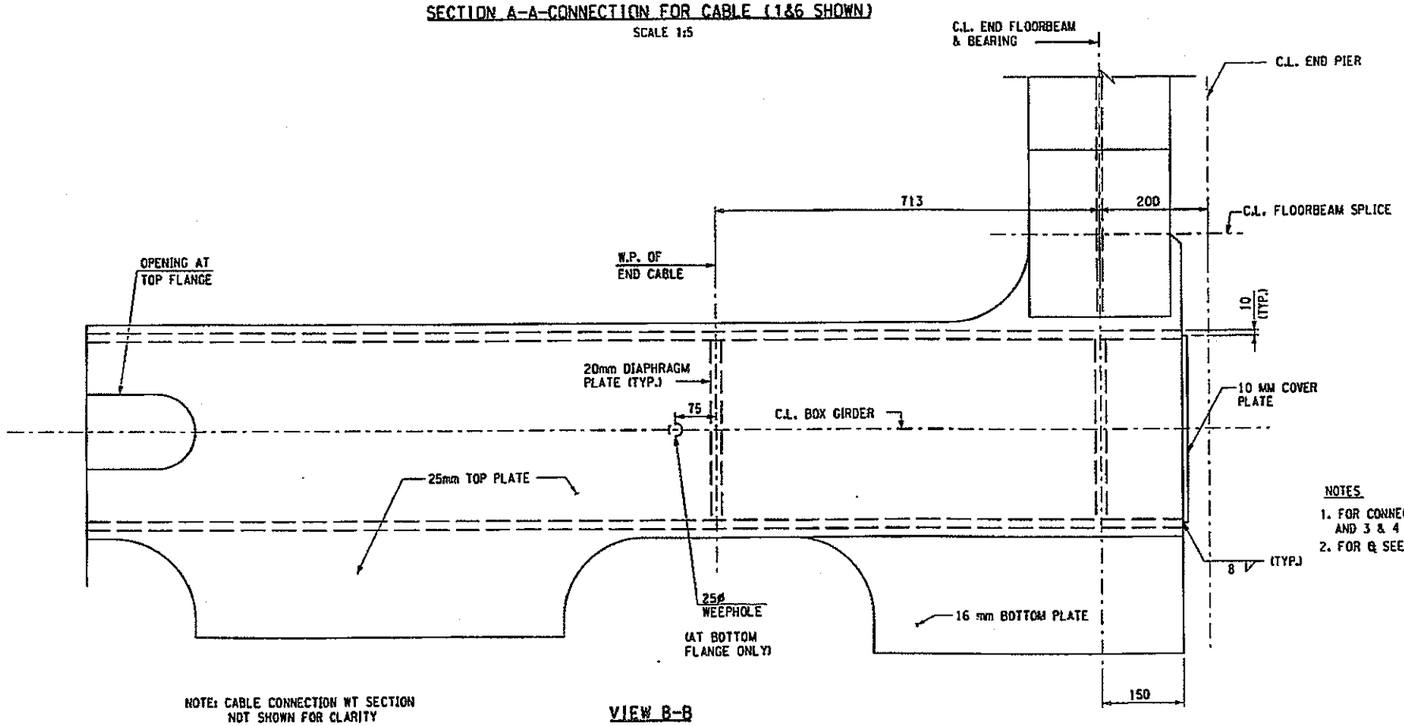


NOTE: CABLE & SOCKET NOT SHOWN FOR CLARITY



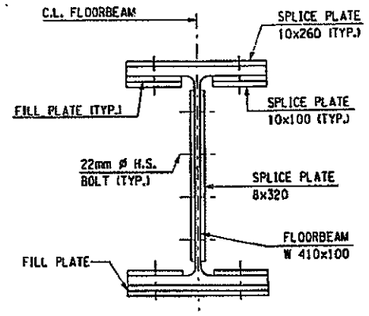
SECTION C-C
SCALE 1:5

SECTION A-A-CONNECTION FOR CABLE (1&6 SHOWN)
SCALE 1:5



NOTE: CABLE CONNECTION WT SECTION NOT SHOWN FOR CLARITY

VIEW B-B
SCALE 1:5



SECTION E-E- CROSS SECTION OF FLOORBEAM SPLICE
SCALE 1:5

NOTES

1. FOR CONNECTION OF CABLES 2 & 5, AND 3 & 4 SEE DWG. NO. SSD-9
2. FOR ℄ SEE DWG. NO. SSD-11

AS-BUILT REVISIONS

SIGNATURE — DATE

MAIN SPAN CABLE ANCHORAGE DETAIL AT BOX GIRDER - 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-8	DEC. 2000	AS NOTED	

JM | CHECKED BY: | PG | DRAFTED BY: | CHECKED BY: | ESTIMATED BY: | JM | CHECKED BY: | RH | DESIGNED BY: | NS | IN CHARGE OF:

JM3APR2220
01/24/2001
L:\NEW\12622\CADD\INTREPID-BRIDGE\ANCHORAGE.DGN
DGN: ANCHORAGE.DGN
USER: JMARAZZO
STYLES: ENVLOG.STY
PLT: ANCHORAGE.PLT

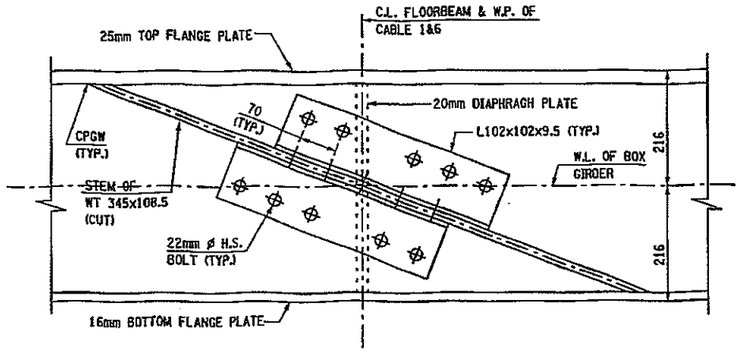
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	44	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

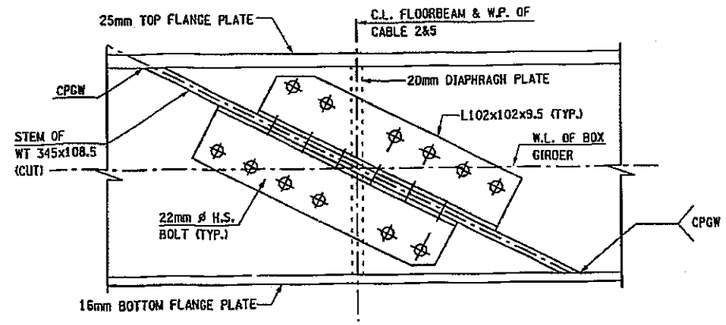
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



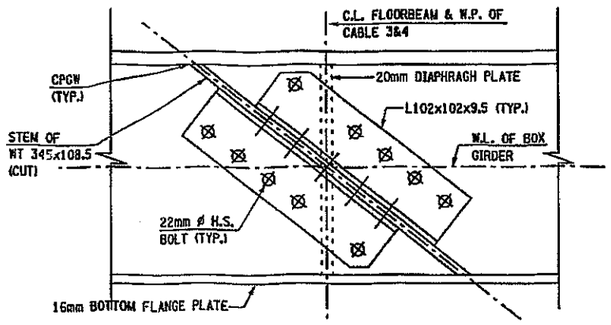
SECTION D-D-CONNECTION FOR CABLE 1&6 SHOWN

SCALE 1:5



SECTION D-D-CONNECTION FOR CABLE 2&5 SHOWN

SCALE 1:5



SECTION D-D-CONNECTION FOR CABLE 3&4 SHOWN

SCALE 1:5

NOTES:

1. FOR LOCATION OF SECTION D-D, SEE DWG. NO. SSD-7.

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN

CABLE ANCHORAGE DETAIL AT BOX GRIDER-3

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-9	DEC. 2000	AS SHOWN	EARTH TECH

JM CHECKED BY: PG DRAFTED BY: CHECKED BY: ESTIMATED BY:

JN CHECKED BY: RH DESIGNED BY: NS IN CHARGE OF:

PLOTTED ON: DEC 7 2000
FILE NAME: C:\WORK\32822\CADD\INTREPID-BRIDGE\ADP\CON-CABLE.DGN
C:\BENTLEY\PROGRAM\4\CROSTATION\PLOTDRV\PRINTER.PLT

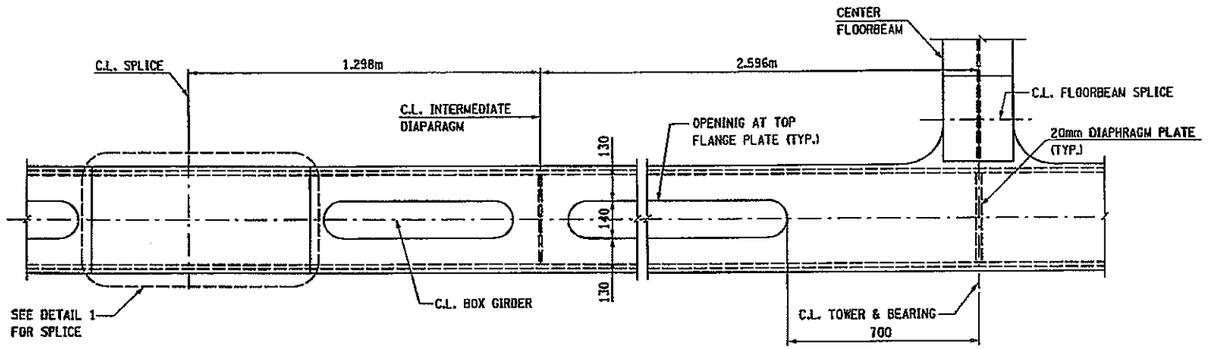
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	45	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

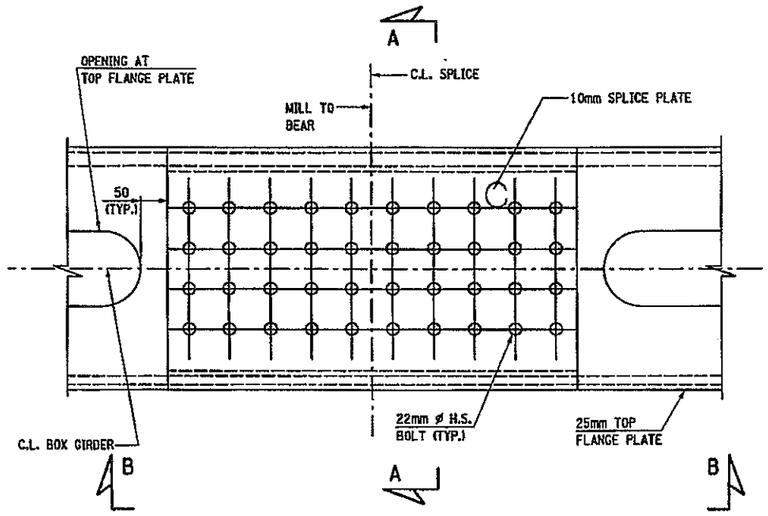


PLAN VIEW OF BOX GIRDER NEAR C.L. TOWER

SCALE 1:10

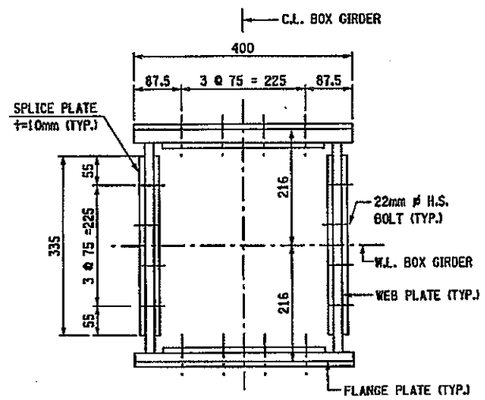
NOTES:

1. BOX BEAM SPLICE SHALL BE IN ACCORDANCE WITH SECTION 1105 OF THE SCM.



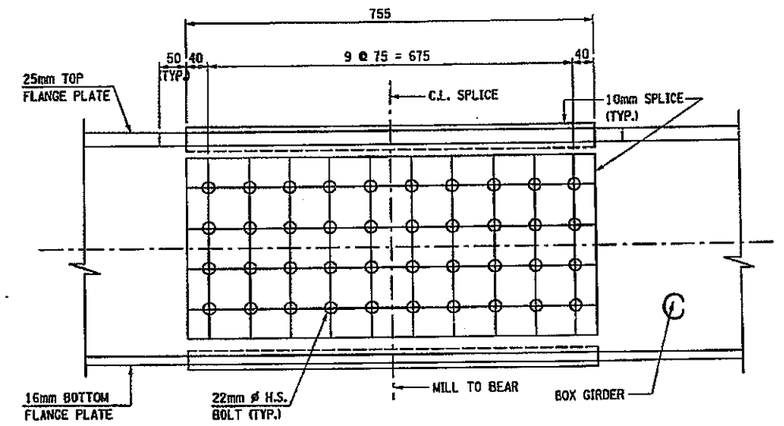
DETAIL 1 - PLAN VIEW OF SPLICE

SCALE 1:5



SECTION A-A

SCALE 1:5



VIEW B-B - ELEVATION

SCALE 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
BOX GIRDER AT C.L.TOWER
& SPLICE DETAILS

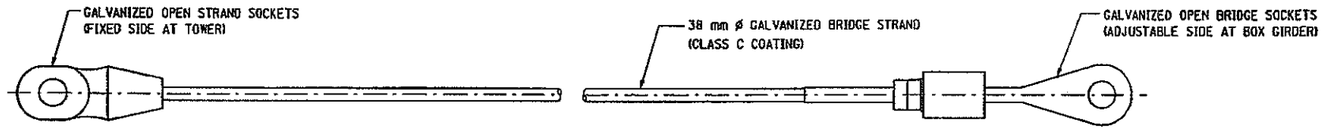
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-10	DEC. 2000	AS SHOWN	EARTH TECH

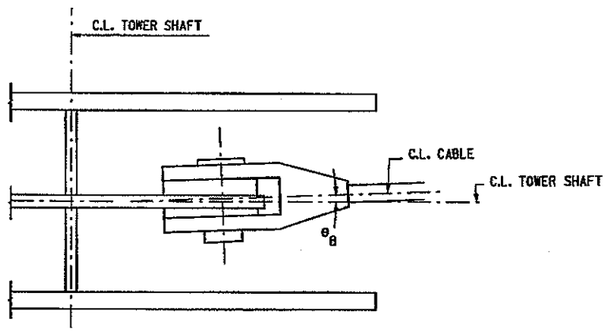
JN CHECKED BY: PG DRAFTED BY: CHECKED BY: ESTIMATED BY: JM CHECKED BY: DESIGNED BY: RH IN CHARGE OF: NS

B.JORDAN
DATE: 12/20/2000
L:\work\32822\cadd\intrepid-bridge\dgn\splice.dgn
C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583 46		142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



CABLE DETAIL
SCALE = 1:8



SECTION D-D
SCALE = 1:5

TABLE OF CABLE ANCHORAGE GEOMETRY

CABLE NO.	TOWER SIDE		BOX GIRDER SIDE		CABLE D.L. FORCE AT LOWER END (kn)
	θ_A (DEGREE)	θ_B (DEGREE)	θ_C (DEGREE)	θ_D (DEGREE)	
1	22.30	1.16	21.81	1.85	145
2	26.87	1.50	26.72	2.18	383
3	39.04	2.31	38.89	3.14	206
4	38.35	2.22	38.21	3.14	200
5	26.06	1.39	25.90	2.18	380
6	21.69	1.08	21.19	1.85	146

NOTE:
FOR DEFINITION OF θ_A SEE DWG. SSD-4 SECTION A-A
θ_B SEE THIS DWG.
θ_C SEE DWG. SSD-7 VIEW A-A
θ_D SEE DWG. SSD-7 DETAIL 1

NOTES:

1. BRIDGE STRAND, SOCKETS, PINS PIN PLATES AND FILL PLATES SHALL BE PAID UNDER ITEM 11564.99 M
2. DEAD LOAD REACTION OF WEST END BEARING (@ PIER 3) = 23.0 kn PER BEARING (UPWARD) DEAD LOAD REACTION OF EAST END BEARING (@ PIER 5) = 23.3 kn PER BEARING (UPWARD)
3. THE MODULUS OF ELASTICITY OF THE STRAND AFTER PRESTRETCHING SHALL NOT BE LESS THAN 158,600 Mpa, AND THE MINIMUM BREAKING STRENGTH OF THE ONE PART NOT LESS THAN 1,175 kn. THE PRESTRETCHING TENSION SHALL BE 588 kn.
4. STRANDS LENGTHS SHALL BE MEASURED UNDER DEAD LOAD TENSION.
5. FOR LOCATION OF SECTION D-D SEE DWG. NO. SSD-4.

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

MAIN SPAN
CABLE AND CABLE ANCHORAGE GEOMETRY

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-11	DEC. 2000	AS SHOWN	EARTH TECH

DESIGNED BY: RH CHECKED BY: JH ESTIMATED BY: JH CHECKED BY: DC DRAFTED BY: JH CHECKED BY: JH
IN CHARGE OF: NS
BJORKMAN
DATE: 12/20/00
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C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT

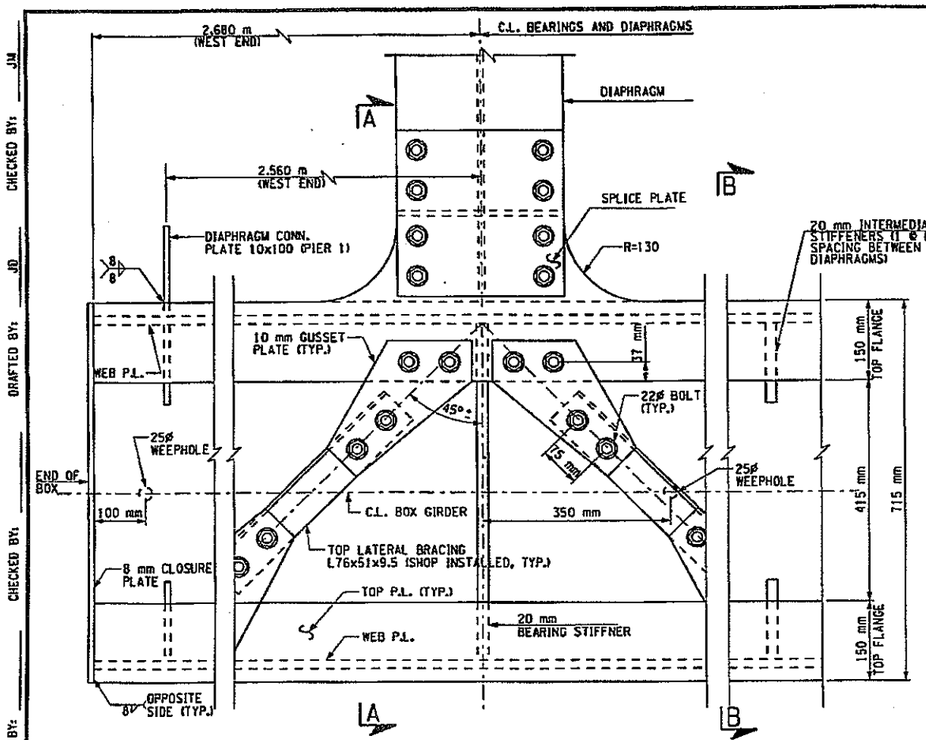
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	47	142

ROUTE 9A RECONSTRUCTION PROJECT

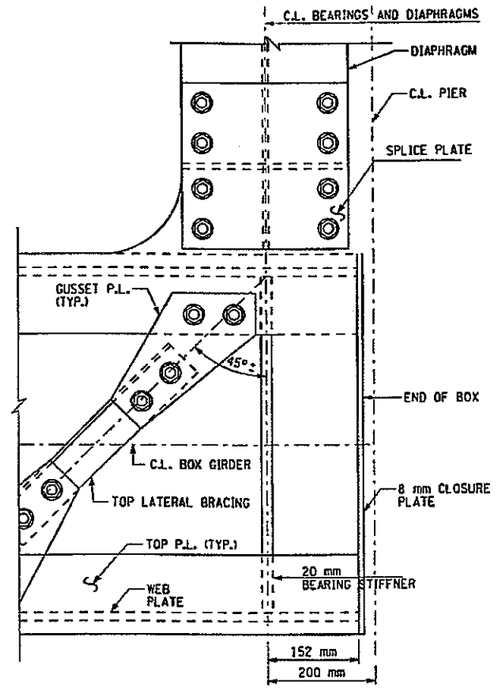
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

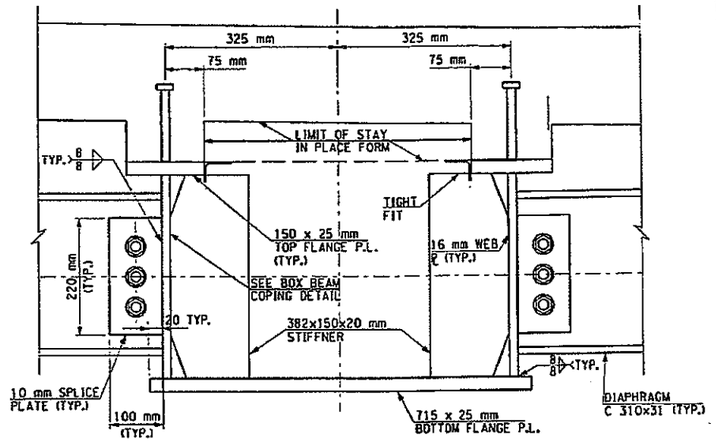
NEW YORK COUNTY PIN: X024.22



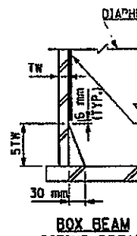
DETAIL 1
SCALE 1:5



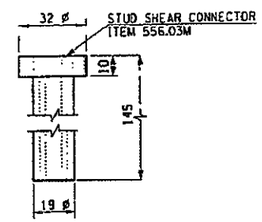
DETAIL 2 - BOX BEAM END DETAIL PIER 3
SCALE 1:5



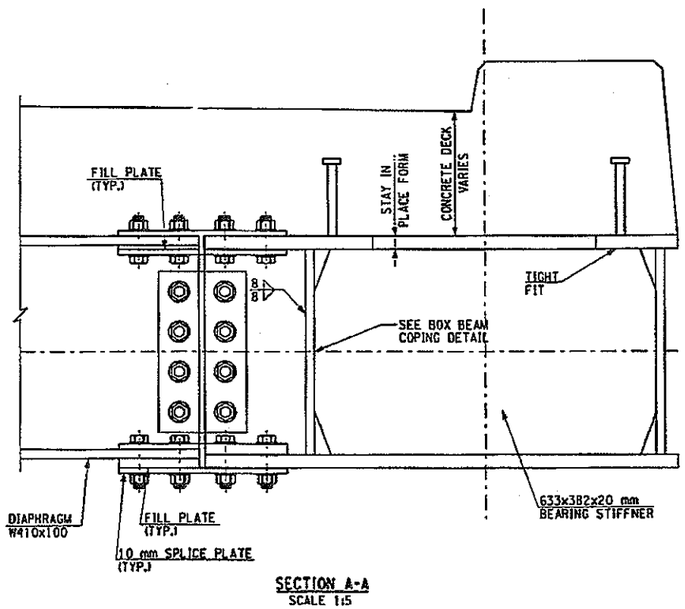
SECTION C-C
INTERIOR BOX AT INTERMEDIATE DIAPHRAGM
SCALE 1:5



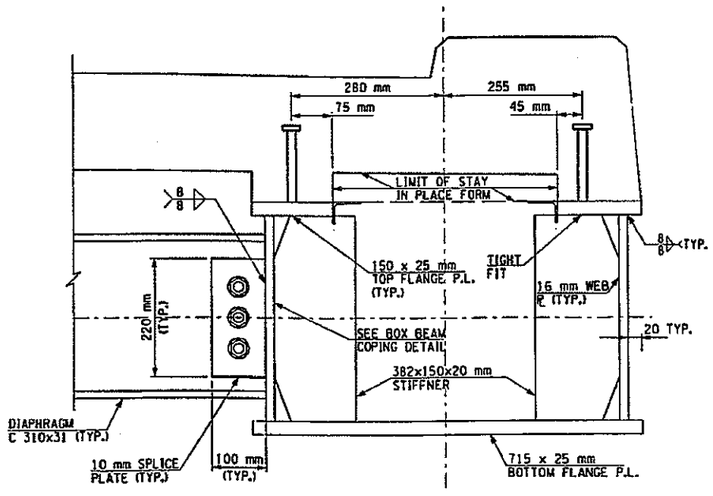
BOX BEAM COPING DETAIL
SCALE: N.T.S



DETAIL OF STUD
SCALE: N.T.S



SECTION A-A
SCALE 1:5



SECTION B-B
EXTERIOR BOX AT INTERMEDIATE DIAPHRAGM
SCALE 1:5

NOTES:

1. DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. FOR ADDITIONAL INFORMATION SEE DWG-NO. SSD-2.
3. FOR SPLICE DETAILS AND LATERAL BRACING LAYOUT, SEE DWG. NO. SSD-13

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
STEEL DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-12	DEC. 2000	AS NOTED	

CHECKED BY: JM
DRAFTED BY: JD
CHECKED BY: JB
DESIGNED BY: JD
IN CHARGE OF: NS
ESTIMATED BY:

JW3TARRAZZO
D:\CADD\Projects\2022\CADD\INTREPID-BRIDGE\PSBE\X024222CP.S1A
D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT

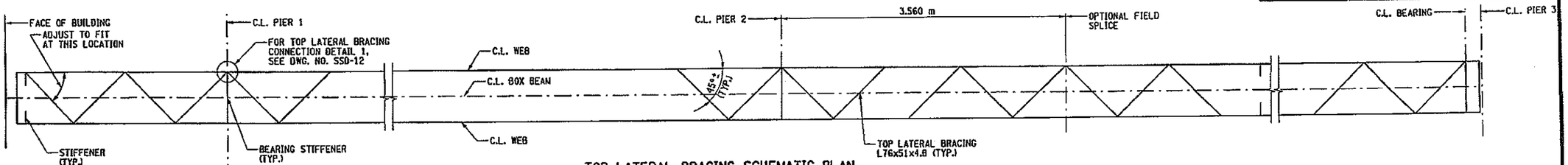
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	48	142

ROUTE 9A RECONSTRUCTION PROJECT

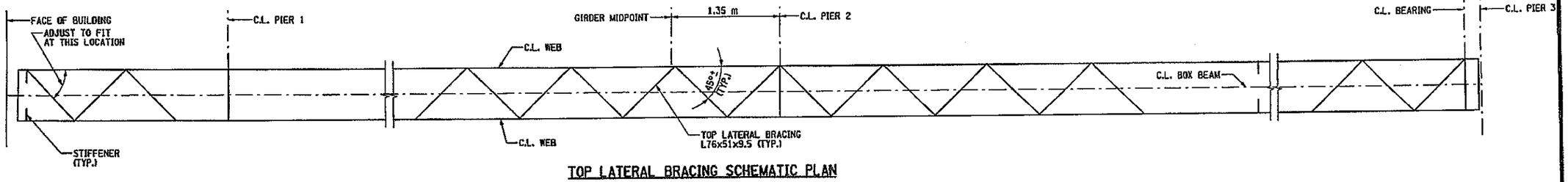
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

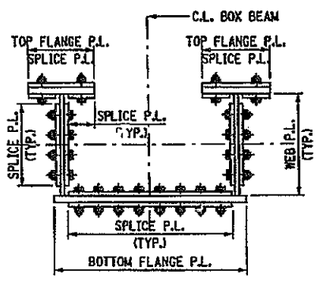
NEW YORK COUNTY — PIN: X024.22



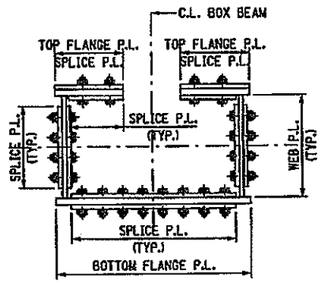
TOP LATERAL BRACING SCHEMATIC PLAN
(OPTIONAL FIELD SPLICE)
SCALE: 1:25



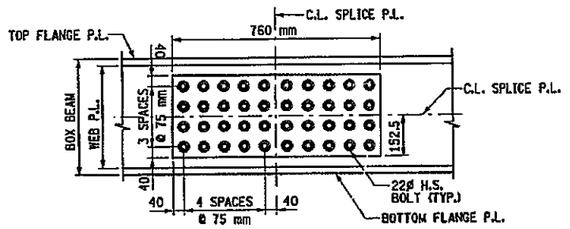
TOP LATERAL BRACING SCHEMATIC PLAN
(NO FIELD SPLICE)
SCALE: 1:25



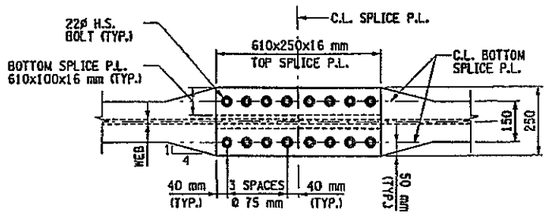
INTERIOR BOX SECTION
SCALE 1:10



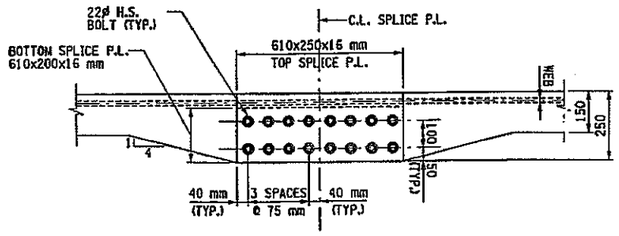
EXTERIOR BOX SECTION
SCALE 1:10



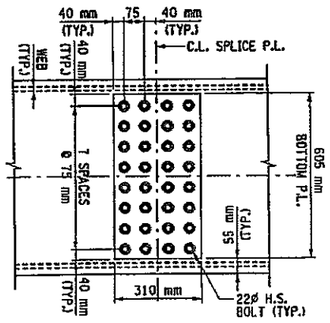
WEB SPLICE DETAIL
SCALE 1:10



TOP FLANGE SPLICE DETAIL
SCALE 1:10



TOP FLANGE SPLICE DETAIL (AT FASCIAS ONLY)
SCALE 1:10



BOTTOM SPLICE PLATE DETAIL
SCALE 1:10

NOTES:
1. TOP LATERAL BRACING LAYOUT IS SCHEMATIC ONLY AND IS INTENDED TO PREVENT DISTORTION OF THE BOX BEAMS DURING FABRICATION, TRANSPORTATION, AND ERECTION. THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE METHOD.

AS-BUILT REVISIONS

SIGNATURE — DATE

TOP LATERAL BRACING SCHEMATIC PLAN AND FIELD SPLICE DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-13	DEC. 2000	1:25	

DRAWN BY: JM — CHECKED BY: JD — DRAFTED BY: JD — CHECKED BY: — ESTIMATED BY: — CHECKED BY: JD — DESIGNED BY: JB — IN CHARGE OF: NS

PDMODLE
12/19/00
C:\WORK\32822\CADD\INTREPID-BRIDGE\PAGE\X032422SP.SLD
C:\MICROSTATION\WISPACE\SYSTEM\FLOOR\SSD-13.PLT

MOMENT & SHEAR TABLE		BEGIN SPAN 1	0.50 L_1	C.L. BRG. PIER 1	0.10 L_2	0.20 L_2	0.30 L_2	0.40 L_2	0.50 L_2	0.60 L_2	0.70 L_2	0.80 L_2	0.90 L_2	C.L. BRG. PIER 2	0.10 L_3	0.20 L_3	0.30 L_3	0.40 L_3	0.50 L_3	0.60 L_3	0.70 L_3	0.80 L_3	0.90 L_3	C.L. BRG. PIER 3
B1	DL	MOMENT	0.0	-9.5	-37.7	58.9	126.1	163.9	182.0	184.8	170.8	148.1	115.1	185.0	-341.7	-183.7	-52.0	53.5	129.6	177.4	199.0	192.4	154.5	90.4	0.0
		SHEAR	-2.2	-13.5	88.6	45.9	29.9	13.9	-2.1	-17.0	-31.9	-49.8	-64.7	-79.6	190.7	81.4	66.6	51.9	34.2	19.5	4.7	-13.9	-28.7	-43.4	-58.1
	S.D.L.	MOMENT	0.0	-2.6	-8.0	4.4	12.0	14.9	15.2	11.9	3.9	-10.1	-31.3	-57.2	-87.9	-49.0	-14.8	14.9	49.8	85.9	117.5	129.2	117.6	61.1	0.0
		SHEAR	-1.1	-2.8	13.1	5.6	2.9	0.3	-0.5	-3.2	-5.8	-10.5	-13.1	-15.7	41.5	20.5	17.9	15.3	21.6	19.0	16.4	17.6	-30.4	-33.0	-35.6
	L.L.(+)	MOMENT	0.0	6.9	13.8	36.9	60.0	77.8	83.3	80.1	71.6	54.5	25.4	5.1	2.8	6.8	27.6	55.6	72.1	79.6	82.0	76.0	55.8	30.4	0.0
		SHEAR	-11.0	4.9	13.1	16.3	13.5	11.1	5.7	4.4	3.2	2.6	2.5	2.4	25.1	24.6	21.8	18.9	11.9	10.0	8.2	4.3	3.7	3.4	3.3
	L.L. (-)	MOMENT	0.0	-5.3	-13.7	-13.8	-19.0	-24.2	-28.9	-33.2	-37.6	-40.9	-42.5	-58.0	-96.8	-59.3	-43.7	-40.3	-35.5	-29.5	-23.6	-17.7	-11.8	-5.9	0.0
		SHEAR		-4.7	5.1	-3.5	-3.6	-4.1	-7.0	-8.6	-10.3	-16.7	-19.5	-22.3	26.8	-1.3	-1.3	-1.4	-1.5	-2.5	-3.6	-9.5	-11.8	-14.3	-18.5
B2	DL	MOMENT	0.0	-11.5	-44.7	58.0	126.6	161.2	183.8	168.6	122.9	48.2	-54.0	-186.7	-349.7	-185.4	-50.9	53.8	131.5	180.8	200.4	191.6	157.5	93.7	0.0
		SHEAR	-0.5	-16.0	98.0	48.1	29.7	11.3	0.0	-16.9	-33.8	-48.3	-65.3	-82.2	199.7	83.9	67.2	50.5	36.1	19.4	2.6	-10.8	-27.5	-44.2	-61.0
	S.D.L.	MOMENT	0.0	0.6	-0.2	7.4	12.5	15.4	13.0	6.9	-1.5	-13.6	-30.3	-49.4	-70.9	-36.3	-4.1	25.8	50.5	71.1	89.4	94.3	65.2	33.8	0.0
		SHEAR	1.0	-0.1	5.9	3.5	2.2	0.9	-2.7	-4.0	-5.4	-8.7	-10.0	-11.3	32.7	16.8	17.5	16.2	12.2	10.9	9.6	-15.7	-17.0	-18.3	-19.6
	L.L.(+)	MOMENT	0.0	4.4	7.0	40.6	75.1	94.8	106.8	107.7	93.7	68.6	37.0	10.7	3.2	11.8	39.0	69.4	93.7	107.4	106.7	94.7	77.6	46.0	0.0
		SHEAR	5.2	3.1	30.9	28.7	21.4	12.7	14.5	9.0	5.3	8.6	4.4	1.9	46.8	39.9	32.5	26.8	21.9	15.8	11.3	13.9	8.5	4.9	3.6
	L.L. (-)	MOMENT	0.0	-12.1	-31.3	-19.4	-23.2	-27.0	-31.4	-36.0	-40.6	-46.3	-55.4	-84.5	-147.2	-85.6	-57.1	-46.2	-38.7	-32.3	-25.8	-19.4	-12.9	-6.5	0.0
		SHEAR	-7.1	-11.1	18.2	-3.4	-4.3	-12.1	-8.4	-11.1	-15.6	-23.0	-27.0	-32.7	47.9	-0.5	-1.2	-3.6	-2.5	-4.5	-8.1	-11.8	-14.5	-19.0	-29.9
B3	DL	MOMENT	0.0	-11.5	-44.7	58.0	126.6	161.2	183.8	168.6	122.9	48.2	-54.0	-186.7	-349.7	-185.4	-50.9	53.8	131.5	180.8	200.4	191.6	157.5	93.7	0.0
		SHEAR	-0.5	-16.0	98.0	48.1	29.7	11.3	0.0	-16.9	-33.8	-48.3	-65.3	-82.2	199.7	83.9	67.2	50.5	36.1	19.4	2.6	-10.8	-27.5	-44.2	-61.0
	S.D.L.	MOMENT	0.0	0.2	-1.0	6.4	11.5	14.3	12.3	6.9	-0.9	-11.2	-23.8	-38.7	-56.0	-26.7	0.4	25.1	41.6	52.3	60.6	61.0	43.0	22.7	0.0
		SHEAR	0.7	-0.4	6.2	3.5	2.2	0.9	-2.4	-3.7	-5.0	-6.4	-7.7	-9.0	27.4	15.9	14.6	13.3	6.6	5.3	4.0	-9.5	-10.8	-12.1	-13.4
	L.L.(+)	MOMENT	0.0	4.4	7.0	40.6	75.1	94.8	106.8	107.7	93.7	68.6	37.0	10.7	3.2	11.8	39.0	69.4	93.7	107.4	106.7	94.7	77.6	46.0	0.0
		SHEAR	5.2	3.1	30.9	28.7	21.4	12.7	14.5	9.0	5.3	8.6	4.4	1.9	46.8	39.9	32.5	26.8	21.9	15.8	11.3	13.9	8.5	4.9	3.6
	L.L. (-)	MOMENT	0.0	-12.1	-31.3	-19.4	-23.2	-27.0	-31.4	-36.0	-40.6	-46.3	-55.4	-84.5	-147.2	-85.6	-57.1	-46.2	-38.7	-32.3	-25.8	-19.4	-12.9	-6.5	0.0
		SHEAR	-7.1	-11.1	18.2	-3.4	-4.3	-12.1	-8.4	-11.1	-15.6	-23.0	-27.0	-32.7	47.9	-0.5	-1.2	-3.6	-2.5	-4.5	-8.1	-11.8	-14.5	-19.0	-29.9
B4	DL	MOMENT	0.0	-9.5	-37.7	58.9	126.1	163.9	182.0	184.8	170.8	148.1	115.1	185.0	-341.7	-183.7	-52.0	53.5	129.6	177.4	199.0	192.4	154.5	90.4	0.0
		SHEAR	-0.2	-13.5	88.6	45.9	29.9	13.9	-2.1	-17.0	-31.9	-49.8	-64.7	-79.6	190.7	81.4	66.6	51.9	34.2	19.5	4.7	-13.9	-28.7	-43.4	-58.1
	S.D.L.	MOMENT	0.0	-2.6	-8.0	3.7	10.6	12.8	13.2	10.3	2.7	-7.2	-17.0	-31.5	-50.7	-22.5	1.1	20.1	33.5	41.6	45.0	42.9	33.2	18.9	0.0
		SHEAR	-0.8	-2.9	12.7	5.2	2.5	-0.1	-0.3	-2.9	-5.6	-4.1	-6.7	-9.4	29.1	14.6	12.0	9.4	5.9	3.3	0.7	-4.1	-6.7	-9.3	-11.9
	L.L.(+)	MOMENT	0.0	6.9	13.8	36.9	60.0	77.8	83.3	80.1	71.6	54.5	25.4	5.1	2.8	6.8	27.6	55.6	72.1	79.6	82.0	76.0	55.8	30.4	0.0
		SHEAR	5.0	4.9	13.1	16.3	13.5	8.9	5.7	4.4	3.2	2.6	2.5	2.4	25.1	24.6	21.8	18.9	11.9	10.0	8.2	4.3	3.7	3.4	3.3
	L.L. (-)	MOMENT	0.0	-5.3	-13.7	-13.8	-19.0	-24.2	-28.9	-33.2	-37.6	-40.9	-42.5	-58.0	-96.8	-59.3	-43.7	-40.3	-35.5	-29.5	-23.6	-17.7	-11.8	-5.9	0.0
		SHEAR	-2.6	-4.7	5.1	-3.5	-3.6	-4.8	-7.0	-8.6	-10.3	-16.7	-19.5	-22.3	26.8	-1.3	-1.3	-1.4	-1.5	-2.5	-3.6	-9.5	-11.8	-14.3	-18.5

MOMENT AND SHEAR TABLE

MOMENTS AND SHEARS ARE UNFACTORED
MOMENTS ARE EXPRESSED IN kN-m
SHEARS ARE EXPRESSED IN kN

B1	
D.L. (kN/m) SLAB	4.35
HAUNCH	0.26
GIRDER (AVG.)	2.89
MISC STEEL	0.66
STAY IN PLACE FORM	0.12
TOTAL	8.28
S.D.L. (kN/m) BARRIER & RAIL	1.46
TOTAL	1.46

LOAD TABLE FOR B1
STAIR LOAD NOT SHOWN IN TABLE,
TWO POINT LOADS @ 11.35 KN

B2 AND B3	
D.L. (kN/m) SLAB	5.98
HAUNCH	0.28
GIRDER (AVG.)	2.89
MISC STEEL	0.12
STAY IN PLACE FORM	0.12
TOTAL	9.39
S.D.L. (kN/m) BARRIER & RAIL	0.73
TOTAL	0.73

LOAD TABLE FOR B2 AND B3

B4	
D.L. (kN/m) SLAB	4.35
HAUNCH	0.26
GIRDER (AVG.)	2.89
MISC STEEL	0.66
STAY IN PLACE FORM	0.12
TOTAL	8.28
S.D.L. (kN/m) BARRIER & RAIL	1.46
TOTAL	1.46

LOAD TABLE FOR B4

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	49	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
MOMENT AND SHEAR TABLE

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-14	DEC. 2000	N.T.S	EARTH TECH

JH CHECKED BY:
JB DRAFTED BY:
JD ESTIMATED BY:
CHECKED BY:
JB DESIGNED BY:
NS IN CHARGE OF:

PCAMOLE
12/19/00
L:\WORK\32822\CADD\INTREPID-BRIDGE\PSHEV82422P.LIE
L:\WORK\32822\WORKSPACE\SYSTEM\FLOORVIEWER.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	50	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

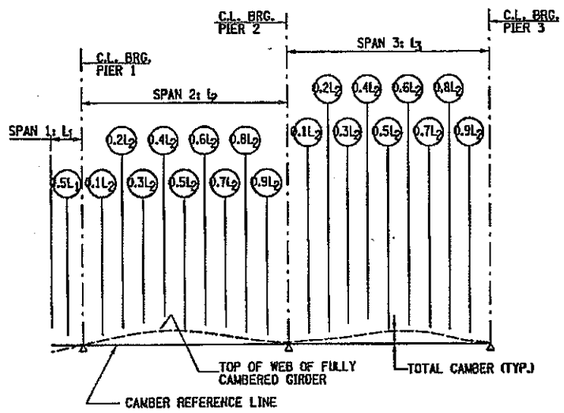
NEW YORK COUNTY PIN: X024.22

CAMBER TABLE		BEGIN SPAN 1	0.50 L_1	C.L. BRG. PIER 1	0.10 L_2	0.20 L_2	0.30 L_2	0.40 L_2	0.50 L_2	0.60 L_2	0.70 L_2	0.80 L_2	0.90 L_2	C.L. BRG. PIER 2	0.10 L_3	0.20 L_3	0.30 L_3	0.40 L_3	0.50 L_3	0.60 L_3	0.70 L_3	0.80 L_3	0.90 L_3	C.L. BRG. PIER 3
B1.84	STEEL D.L.	-0.003	-0.002	0.000	0.002	0.005	0.007	0.008	0.008	0.007	0.005	0.004	0.002	0.000	0.001	0.002	0.005	0.007	0.007	0.008	0.008	0.006	0.004	0.000
	CONCRETE D.L.	-0.006	-0.003	0.000	0.004	0.008	0.011	0.012	0.012	0.010	0.008	0.006	0.003	0.000	0.001	0.004	0.008	0.011	0.012	0.013	0.013	0.010	0.006	0.000
	SUPER IMPOSED DEAD LOAD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.004	0.005	0.005	0.006	0.006	0.005	0.003	0.000
	VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL DEFLECTION	-0.009	-0.005	0.000	0.006	0.013	0.018	0.020	0.020	0.017	0.013	0.010	0.005	0.000	0.003	0.008	0.017	0.023	0.024	0.027	0.027	0.021	0.013	0.000
B2.83	STEEL D.L.	-0.003	-0.002	0.000	0.002	0.005	0.007	0.008	0.007	0.006	0.005	0.004	0.002	0.000	0.001	0.002	0.005	0.006	0.007	0.008	0.008	0.006	0.004	0.000
	CONCRETE D.L.	-0.006	-0.003	0.000	0.004	0.008	0.011	0.013	0.012	0.011	0.008	0.006	0.003	0.000	0.001	0.004	0.008	0.011	0.012	0.013	0.013	0.010	0.006	0.000
	SUPER IMPOSED DEAD LOAD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.003	0.003	0.004	0.004	0.004	0.003	0.002	0.000
	VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL DEFLECTION	-0.009	-0.005	0.000	0.006	0.013	0.018	0.021	0.019	0.017	0.013	0.010	0.005	0.000	0.003	0.008	0.016	0.020	0.023	0.025	0.025	0.019	0.012	0.000

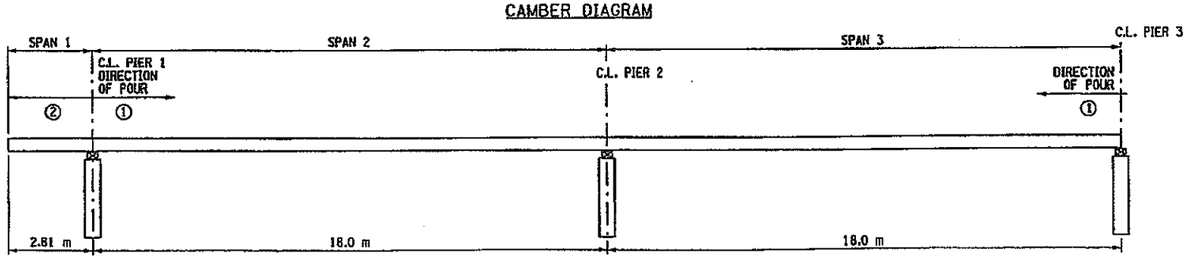
CAMBER TABLE

TOP OF PAVEMENT ELEVATIONS		BEGIN SPAN 1	0.50 L_1	C.L. BRG. PIER 1	0.10 L_2	0.20 L_2	0.30 L_2	0.40 L_2	0.50 L_2	0.60 L_2	0.70 L_2	0.80 L_2	0.90 L_2	C.L. BRG. PIER 2	0.10 L_3	0.20 L_3	0.30 L_3	0.40 L_3	0.50 L_3	0.60 L_3	0.70 L_3	0.80 L_3	0.90 L_3	C.L. BRG. PIER 3
B1.84	A. REQUIRED BOTTOM OF SLAB ELEVATION.	5.831	5.895	5.960	6.096	6.182	6.269	6.355	6.442	6.528	6.614	6.701	6.787	6.874	6.960	7.046	7.133	7.219	7.306	7.392	7.478	7.565	7.651	7.738
	B. TOP OF STEEL ELEVATION (FIELD MEASURE)																							
	C=A-B																							
	D. CONCRETE + SDL DEFLECTION.	-0.006	-0.003	0.000	0.004	0.008	0.011	0.012	0.012	0.010	0.008	0.006	0.003	0.000	0.002	0.006	0.012	0.016	0.017	0.019	0.019	0.015	0.009	0.000
	E. DEPTH OF HAUNCH = C+D																							
B2.83	A. REQUIRED BOTTOM OF SLAB ELEVATION.	5.852	5.917	5.981	6.117	6.204	6.290	6.377	6.463	6.549	6.636	6.722	6.809	6.895	6.981	7.068	7.154	7.241	7.327	7.413	7.500	7.586	7.673	7.759
	B. TOP OF STEEL ELEVATION (FIELD MEASURE)																							
	C=A-B																							
	D. CONCRETE + SDL DEFLECTION.	-0.006	-0.003	0.000	0.004	0.008	0.011	0.013	0.012	0.011	0.008	0.006	0.003	0.000	0.002	0.006	0.011	0.014	0.016	0.017	0.017	0.013	0.008	0.000
	E. DEPTH OF HAUNCH = C+D																							

HAUNCH TABLE



CAMBER DIAGRAM



TOTAL VOLUME OF DECK ~ 40m³

①&② = PLACEMENT

SUGGESTED CONCRETE PLACEMENT SEQUENCE
N.T.S.

CAMBER NOTES:

1. ALL CAMBERS ARE ASSUMED TO BE MEASURED VERTICALLY TO THE TOP OF FULLY CAMBERED WEB FROM A STRAIGHT REFERENCE LINE DRAWN FROM THE INTERSECTION OF TOP OF WEB AND CENTERLINE OF BEARING AT ONE END OF THE GIRDER TO THE INTERSECTION OF TOP OF WEB AND CENTERLINE OF BEARING AT THE OTHER END OF THE GIRDER.
2. THE CAMBER LABELED "SUPERIMPOSED D.L." IN THE TABLE IS THE CAMBER REQUIRED IN THE GIRDER TO OFFSET THE DEFLECTION DUE TO THE WEIGHT OF BARRIERS, RAILING
3. THE CAMBER LABELED "VERTICAL CURVE" IN THE TABLE IS THE CAMBER REQUIRED IN THE GIRDER TO FOLLOW THE VERTICAL CURVE PROFILE GRADE.
4. CAMBERS LISTED IN THE TABLE AS POSITIVE ARE UPWARD CAMBERS. CAMBERS LISTED AS NEGATIVE ARE DOWNWARD CAMBERS.
5. CAMBER FOR THE STEEL AND CONC. DEAD LOAD ARE PROVIDED FOR IN THE MANUFACTURING PROCESS.
6. THE CAMBERS ARE TABULATED IN METERS.

NOTE:

1. CONCRETE SHALL BE PLACED DURING A CONTINUOUS WORK PERIOD.
2. SECTION ② CAN BE PLACED AFTER 50% OF PLACEMENT ① IS COMPLETE.

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
CAMBER AND HAUNCH TABLES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSO-15	DEC. 2000	N.T.S	EARTH TECH

DRAFTED BY: JB CHECKED BY: JD
ESTIMATED BY: CHECKED BY: JD
DESIGNED BY: JB CHECKED BY: NS
IN CHARGE OF: NS

PCPABLE
12/18/00
C:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT
I:\2000\32822\CADD_MTRE\PID-PRLOD5\PSAS\WP8425SP.LIB

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO..	TOTAL SHEETS
1	N.Y.	D258583	51	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

MOMENT & SHEAR TABLE		C.L. OF BRGS. PIER 3	.03 L1 (W.P. OF) (CABLE 1)	.11L_1	.19L_1	.27L_1	.35L_1 (W.P. OF CABLE 2)	.43L_1	.51L_1	.60L_1	.68L_1 (W.P. OF CABLE 3)	.76L_1	.84L_1	.92L_1	C.L. BRG. PIER 4	.08L_2	.16L_2	.24L_2	.32L_2 (W.P. OF CABLE 4)	.40L_2	.49L_2	.57L_2	.65L_2 (W.P. OF CABLE 5)	.73L_2	.81L_2	.89L_2	.97L (W.P. OF CABLE 6)	C.L. BRG. PIER 5
D.L.	MOMENT	-3	7.4	65.6	68.5	16.6	-90.3	-5.2	25.3	3.6	-68.0	70	33.3	10.6	-60.9	17.4	35.0	8.9	-66.1	1.8	20.0	11.8	-94.0	13.0	66.3	64.5	7.7	-3
	SHEAR	-2.9/15.9	5.6/43.9	15.7	+12.5	-40.8	-68.9/57.6	29.5	1.6	-25.2	-50.8/52.6	24.5	.5	25.7	-50.8/50.9	22.8	-2.6	-27.5	-52.5/48.9	20.8	-4.8	-30.4	-56.3/69.1	40.9	13.2	15.0	-43.2/-6.0	-16.3/2.9
	AXIAL FORCE	0	-111.3	-109.9	-108.5	-107.2	-390.9	-389.5	-388.2	-387.0	-519.3	-518.3	-517.7	-517.2	-516.6	-516.3	-516.3	-516.7	-517.0	-387.7	-388.0	-388.8	-389.8	-107.3	-108.4	-109.8	-111.2	0
S.D.L.	MOMENT	0	1.3	11.3	11.9	2.9	-15.6	-.9	4.4	.6	-11.8	1.2	5.8	1.8	-10.5	2.2	6.1	1.5	11.4	.3	3.5	2.0	-16.2	2.3	11.5	11.2	1.3	0
	SHEAR	-0.5/2.8	1.0/7.6	2.7	2.2	-7.0	-11.9/10.0	5.1	.3	-4.4	-8.8/9.1	4.2	1	-4.5	-8.8/8.8	3.9	.4	-4.8	-9.1/8.5	3.6	-.8	-5.3	-9.7/11.9	7.1	2.3	2.6	-7.5/-1.0	-2.8/5
	AXIAL FORCE	0	-19.2	-19.0	-18.8	-18.5	-67.6	-67.4	-67.1	-66.9	-89.8	-89.6	-89.6	-89.4	-89.3	-89.3	-89.3	-89.4	-89.4	-67.0	-67.1	-67.2	-67.4	-18.6	-18.8	-19.0	-19.2	0
L.L. (+)	MOMENT		42..0	111.2	148.4	153.9	127.5	134.0	107.3	47.9										46.8	106.5	133.7	128.2	154.4	148.5	110.8	41.3	
	SHEAR	-1.6/62.1	56.1/43.5	27.3	11.1	-5.3	-21.6/11.4	-4.8	-21.8	-38.5										38.9	22.5	5.9	-10.9/-21.6	5.4	-11.1	-27.5	-43.7/-55.1	-61.1/1.7
	AXIAL FORCE	0	36.0	36.8	36.8	37.5	-33	-32.6	-31.8	-31.2										-34.5	-34.9	-35.4	-35.9	35.3	34.7	34.2	33.8	
L.L. (-)	MOMENT	0	-13.5	-20.3	-27.0	-33.7	-40.3	-33.6	-26.5	-18.6	-53.1	-30.0	-35.6	-69.9	-132.0	-67.0	-35.8	-30.1	-53.1	-18.1	-26.7	-34.3	-40.7	-34.2	-27.2	-20.1	-12.9	0
	SHEAR	01-18.9	-18.9/-3.5	-3.4	-3.4/3.4	3.4	3.7	4.1	4.6	4.1	-50.4/199	3.8	-11.0	-25.7	-40.0/40.0	-33.8	-9.5	-5.2	-19.9/50.1	-5.0	-4.4	-3.9	-3.3/3.3	3.3	3.6	3.7	3.7/18.1	
	AXIAL FORCE	0	-44.2	-44.1	-44.1	-44.1	-60.2	-60.2	-60.2	-60.1	-183.9	-183.2	-182.7	-182.5	-182.3	-183.4	-183.3	-183.5	-183.5	-56.5	-56.5	-56.5	-56.5	-41.2	-41.2	-41.3	-41.3	0

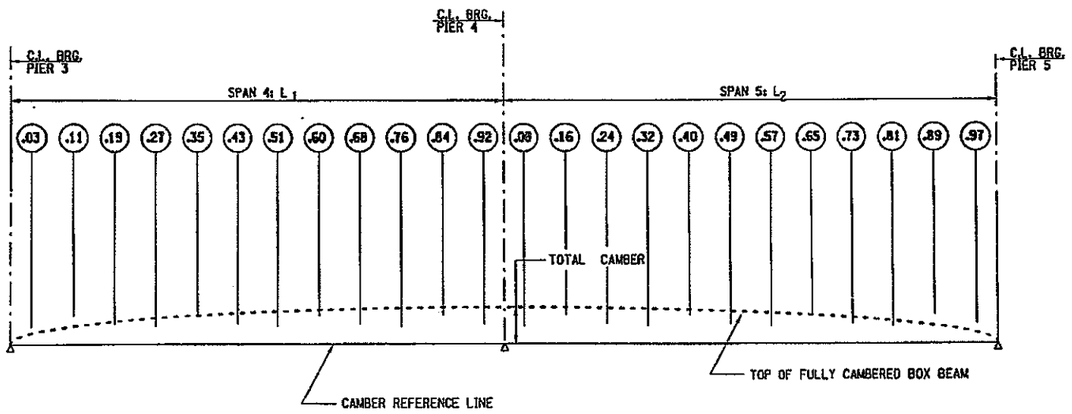
MOMENT ARE EXPRESSED AS KILONEWTON-METERS
SHEAR AER EXPRESSED AS KILONEWTONS
MOMENTS AND SHEARS ARE BASED ON ALLOWABLE STRESS DESIGN.

MOMENT & SHEAR TABLE

CAMBER TABLE	C.L. OF BRG. PIER 3	.03 L1 (W.P. OF) (CABLE 1)	.11L_1	.19L_1	.27L_1	.35L_1 (W.P. OF CABLE 2)	.43L_1	.51L_1	.60L_1	.68L_1 (W.P. OF CABLE 3)	.76L_1	.84L_1	.92L_1	C.L. BRG. PIER 4	.08L_2	.16L_2	.24L_2	.32L_2 (W.P. OF CABLE 4)	.40L_2	.49L_2	.57L_2	.65L_2 (W.P. OF CABLE 5)	.73L_2	.81L_2	.89L_2	.97L (W.P. OF CABLE 6)	C.L. BRG. PIER 5
I D.L. (m)	0	.001	.004	.004	.003	.001	.001	.001	0	0	.001	.001	.001	0	.001	.001	0	-.001	-.001	0	-.001	-.001	.001	.003	.003	.001	0
II VERTICAL CURVE (m)	0	.029	.111	.193	.275	.356	.439	.520	.594	.656	.705	.742	.768	.781	.781	.771	.747	.711	.665	.605	.532	.449	.353	.249	.143	.037	0
TOTAL = I+II (m)	0	.030	.115	.197	.278	.357	.440	.521	.594	.656	.706	.743	.769	.781	.782	.772	.747	.710	.664	.605	.531	.448	.354	.252	.146	.038	0

CAMBER TABLE

DESIGN LOAD TABLE		UNIT 2	LOAD (KN/m)
GIRDERS	D.L.	SLAB	11.6
		HAUNCH	.6
		GIRDER	2.3
		DIAPHRAGMS	.4
		TOTAL	14.9
	S.D.L.		
		CURB	.7
		RAILING.	2.2
		TOTAL	2.9



CAMBER DIAGRAM

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
MOMENT, SHEAR CAMBER AND LOAD TABLES

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-16	DEC. 2000	N.T.S.	

RH CHECKED BY: PG DRAFTED BY: CHECKED BY: ESTIMATED BY: RH CHECKED BY: RH DESIGNED BY: NS IN CHARGE OF:

BJORKMAN
LAST WORK: 2008
C:\DEPTLEX\PROGRAM\CROSTATION\PLOTDRV\PRINTER.PLT
L:\WORK\2022\CADD\INTREPID-BRIDGE\ADP\SB-220-HAUNCH.DGN

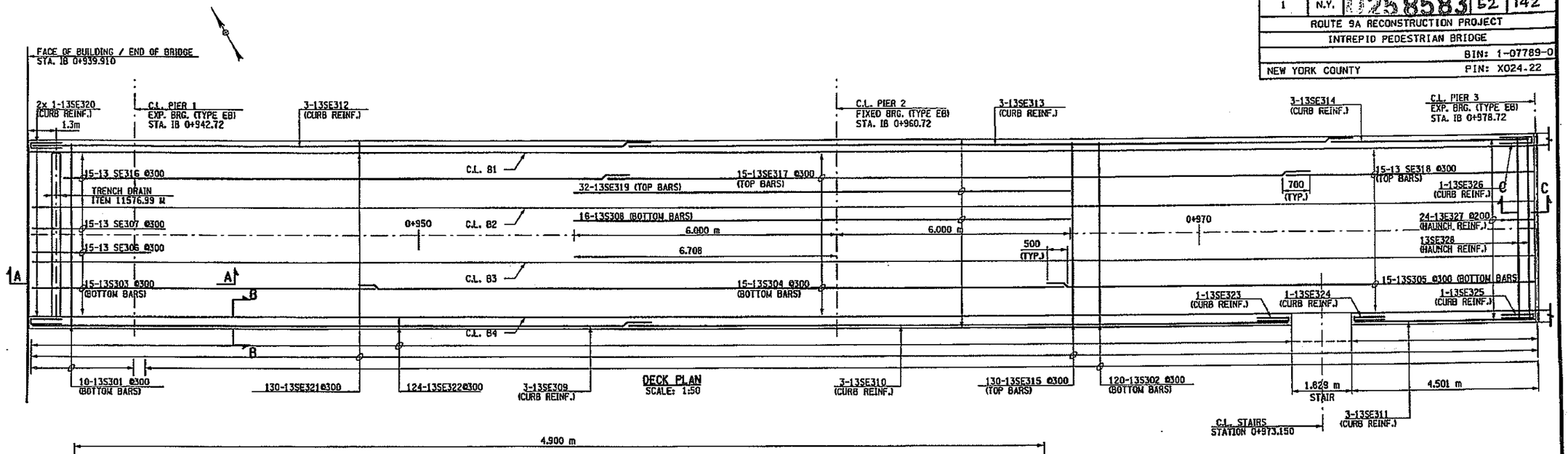
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	52	142

ROUTE 9A RECONSTRUCTION PROJECT

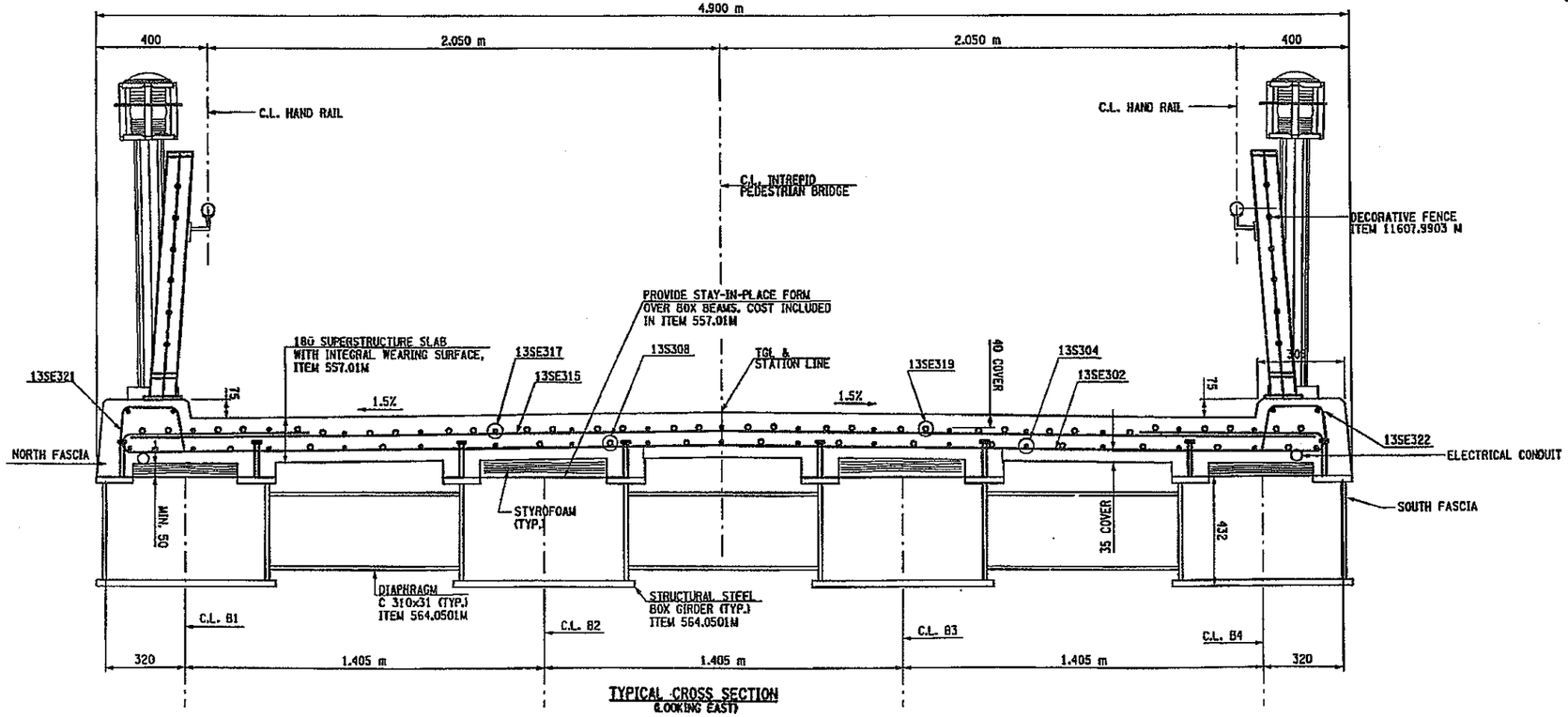
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



DECK PLAN
SCALE: 1:50



TYPICAL CROSS SECTION
(LOOKING EAST)
SCALE: 1:10

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.
2. FOR SECTIONS A-A,B-B, AND C-C SEE DWG. NO. SSD-19
3. FOR DRAINAGE DETAILS, SEE DWG. NO. SSD-23
4. FOR ADDITIONAL REINFORCEMENT AT TRENCH DRAIN LOCATION, SEE DWG. NO. SSD-19
5. FOR EXPANSION JOINT DETAILS AT PIER 3, SEE DWG. NO. SSD-24
6. DECK REINFORCEMENT IS INCLUDED IN THE PRICE BID FOR ITEM 557.01M.
7. FOR BAR LIST SEE DWG. NO. BL-4
8. FOR STAIRS - SEE DWG. NO. WAS-1
9. FOR HAND RAIL ATTACHMENT DETAIL SEE DWG. NO. R-3

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
DECK REINFORCEMENT & TYPICAL SECTION

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-17	DEC. 2000	AS SHOWN	

JD CHECKED BY: JB DRAFTED BY: JD CHECKED BY: AK ESTIMATED BY: JD CHECKED BY: JB DESIGNED BY: MS IN CHARGE OF:

BJORDNAN
12 DEC 2000
C:\MENTLEY\PROGRAM\CONSTRUCTION\PLOTDRV\PLOTDRV.EXE(V8.2.2.2)
D:\DGN\SSD\SSD17.DGN

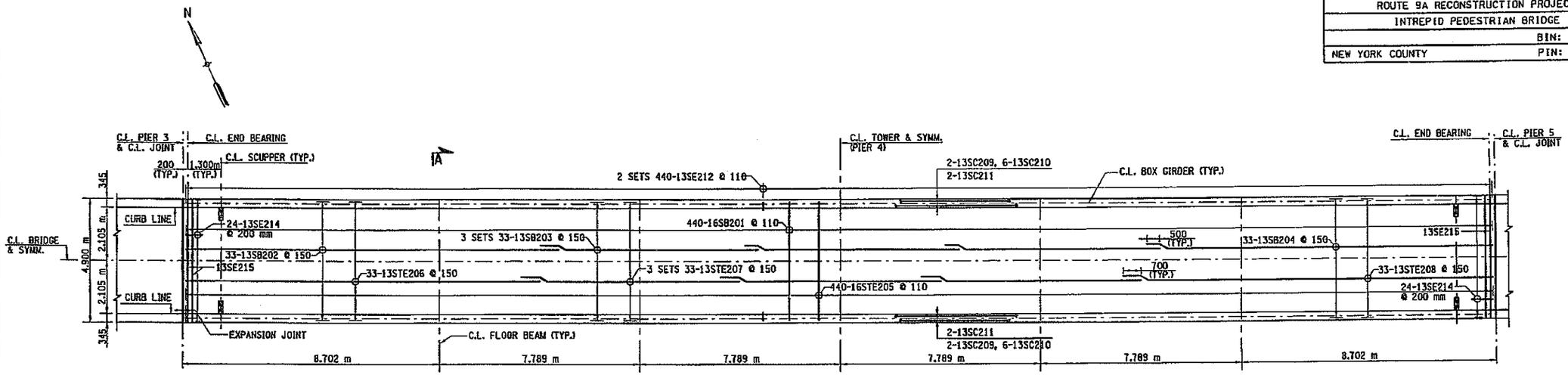
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	53	142

ROUTE 9A RECONSTRUCTION PROJECT

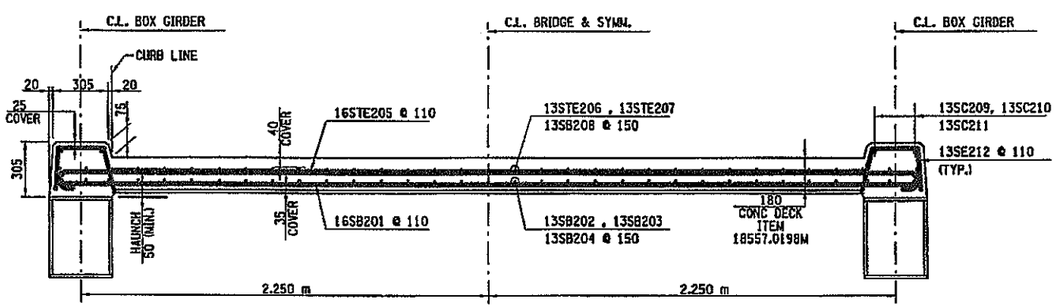
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

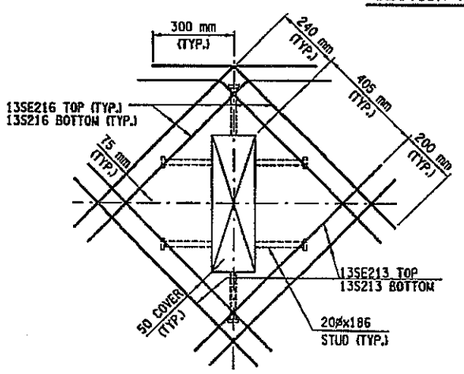
NEW YORK COUNTY PIN: X024.22



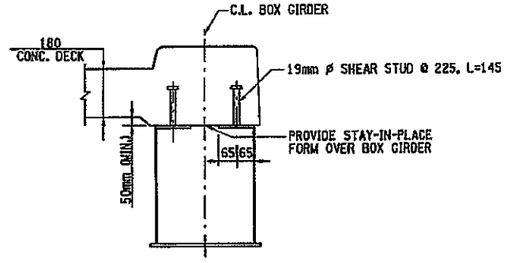
DECK PLAN
SCALE= 1:80



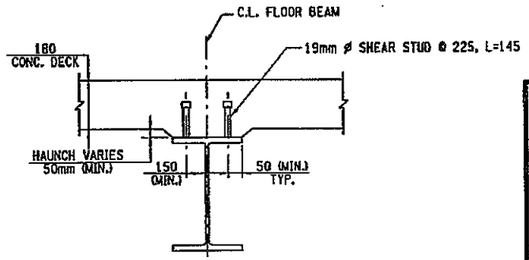
SECTION A-A - TYPICAL CROSS SECTION OF DECK
SCALE= 1:15



REINFORCEMENT PLAN AT SCUPPER
SCALE= 1:10



SHEAR STUD DETAIL AT BOX GIRDER
SCALE= 1:10



SHEAR STUD DETAIL AT FLOOR BEAM
SCALE= 1:10

NOTE

1. FOR BAR LIST SEE DWG. NO. BL-4
2. THE 180 MM CONCRETE DECK IS DESIGNED WITH A 25 MM INTEGRAL WEARING SURFACE WHICH IS NOT CONSIDERED FOR STRUCTURAL PURPOSES.
3. FOR EXPANSION JOINT DETAILS SEE DWG.NO. SSD-24

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
DECK PLAN, SECTION AND DETAILS

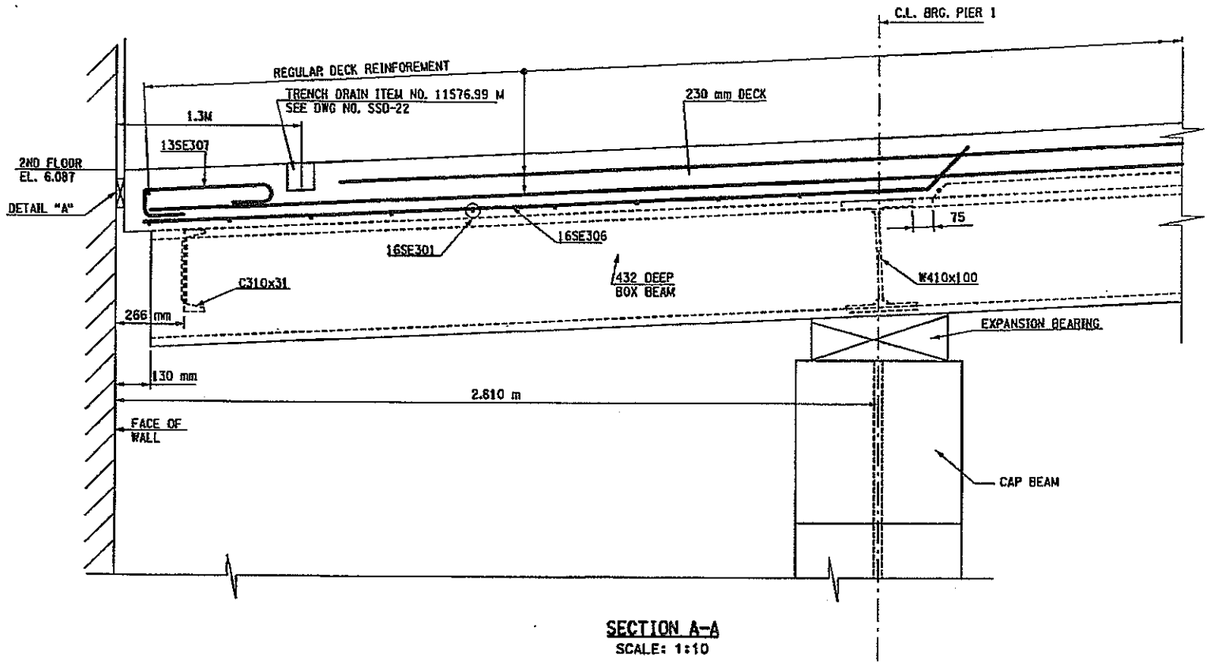
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-18	DEC. 2000	AS SHOWN	

DESIGNED BY: RH CHECKED BY: NS DRAFTED BY: JD CHECKED BY: JD ESTIMATED BY: AK IN CHARGE OF:

BJORKMAN
12/05/00 23:28:22
C:\BENTLEY\PROGRAMS\CROSSIRT.DRV
PLOTDRV
PRINTER
PLT

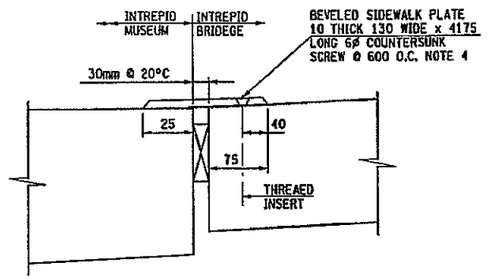
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	54	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



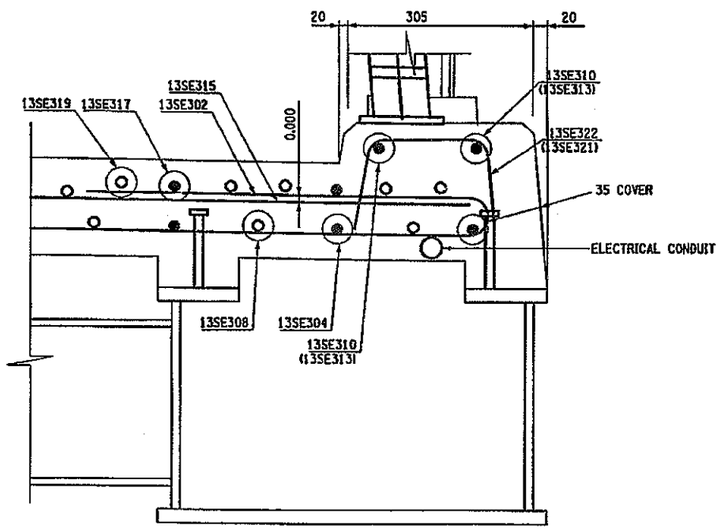
SECTION A-A
SCALE: 1:10

NOTES:

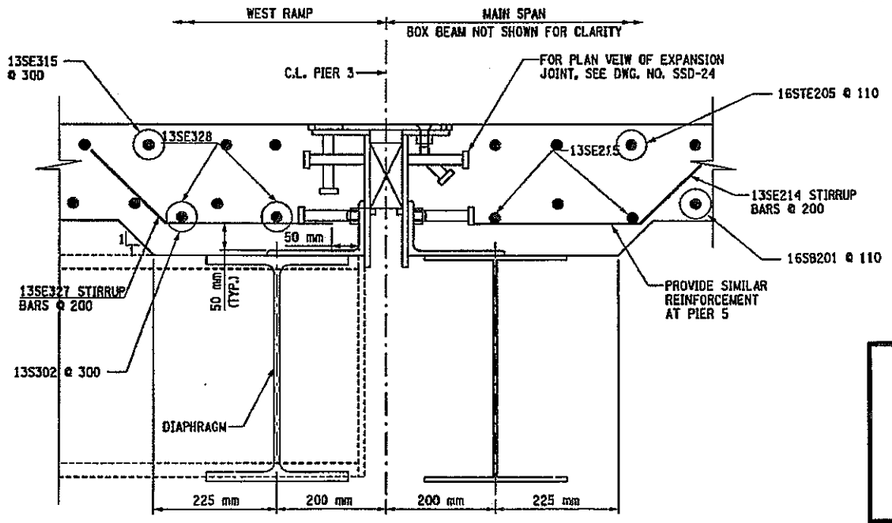
1. FOR DECK PLAN, REFER TO DWG. NO. SSD-17.
2. FOR PIER 1 DETAILS, REFER TO DWG. NO. SUB-7.
3. THE COMPRESSION SEAL SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE SPECIFICATIONS: 567-2.02A, 567-3.01A,B,C AND H. THE ADHESIVE SHALL BE AS RECOMMENDED BY THE COMPRESSION SEAL MANUFACTURER AND APPROVED BY THE ENGINEER. THE COST OF THIS WORK TO BE INCLUDED UNDER ITEM 18557.0198M.
4. SIDEWALK PLATE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 719-01 (TYP.). COST FOR FURNISHING & INSTALLING THE SIDEWALK PLATE AND ANCHORS IS TO BE INCLUDED UNDER ITEM 557.01 M.



DETAIL A



SECTION B-B
SCALE: 1:5
BARMARK INSIDE ( ) FOR NORTH CURB



SECTION C-C
END DIAPHRAGM HAUNCH DETAIL
SCALE: 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH
DECK DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-19	DEC. 2000	AS SHOWN	EARTH TECH

DESIGNED BY: NS
CHECKED BY:
DRAFTED BY: JD/RH
CHECKED BY:
ESTIMATED BY: JN
IN CHARGE OF:

BJORKMAN
LAST WORK 4/28/22
C:\USERS\BENTLEY\PROGRAM\CADSTAT\DNVPLOTDRV\PRINTER.PLT
C:\CADD\INTREPID-BRIDGE\PSAE\X024222CP_SL0

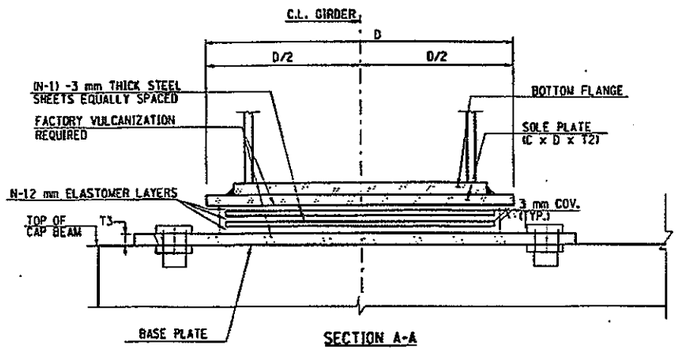
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	55	142

ROUTE 9A RECONSTRUCTION PROJECT

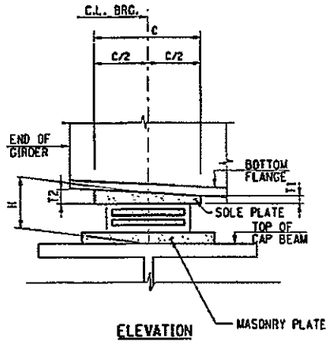
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

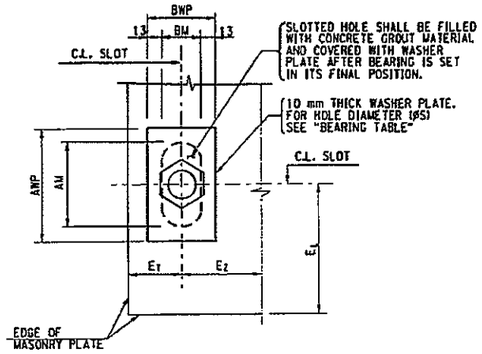
NEW YORK COUNTY — PIN: X024.22



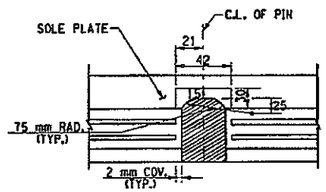
SECTION A-A



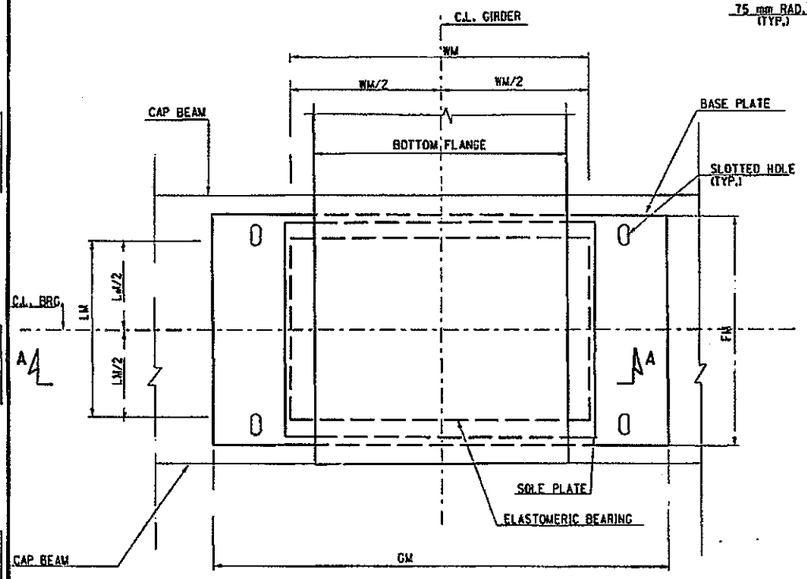
ELEVATION



SLOTTED HOLE DETAIL FOR EXPANSION BEARINGS

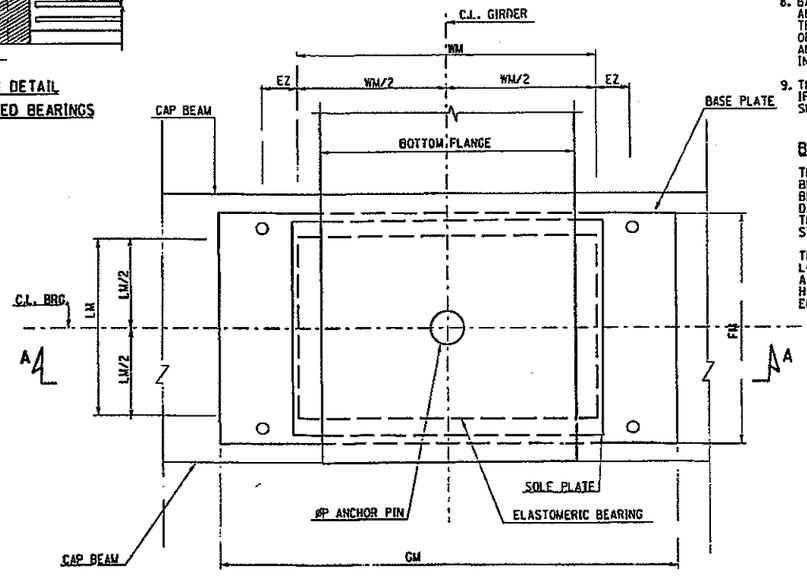


PIN DETAIL FOR FIXED BEARINGS



PLAN

ELASTOMERIC EXPANSION BEARING



PLAN

ELASTOMERIC FIXED BEARING

NOTES:

1. THE BEARINGS ARE DESIGNED SO THAT THE SUPERSTRUCTURE MAY BE ERECTED WHEN THE AMBIENT AIR TEMPERATURE IS WITHIN THE RANGE 4° C TO 32° C.
2. THE HARDNESS (SHORE "A" DUROMETER) OF THE ELASTOMER MATERIAL SHALL BE 50.
3. THE CONTINUOUS WELD CONNECTING THE LOAD PLATE TO THE SOLE PLATE SHALL BE ALLOWED TO COOL AFTER EACH PASS. HOWEVER, THE TEMPARATURE OF THE STEEL ADJACENT TO THE ELASTOMER SHALL NOT EXCEED 93° C. TEMPERATURE SHALL BE CONTROLLED BY WELDING PROCEDURES AND TEMPERATURE INDICATING CRAYONS OR OTHER DEVICES APPROVED BY THE ENGINEER.
4. THE ELASTOMERIC BEARING DEVICE, SOLE PLATE, MASONRY PLATE, ANCHOR BOLTS, NUTS, WASHER PLATES AND BEARING PAD SHALL BE INCLUDED IN UNIT PRICE BID FOR THE BEARING ITEM.
5. ALL MATERIAL WORK SHALL CONFORM TO THE SPECIFICATIONS FOR THE ABOVE ITEM.
6. ALL BEARING CONNECTIONS SHALL BE CAPABLE OF RESISTING A MINIMUM LATERAL FORCE EQUAL TO 19% OF THE DESIGN LOAD (D.L.+L.L.) APPLIED HORIZONTALLY IN ANY DIRECTION.
7. ALL STRUCTURAL STEEL SHALL CONFORM TO A588M GRADE 345.
8. BASE PLATE, WASHERS, WASHER PLATES, ANCHOR PLATES AND NUTS SHALL MEET THE REQUIREMENTS OF SUBSECTION 723-60. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF MATERIAL SPECIFICATION SUBSECTION 719-01, "GALVANIZED COATINGS AND REPAIR METHODS". THEIR COST (INCLUDING GALVANIZING) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BEARING ITEM.
9. THE COST OF FURNISHING AND INSTALLING SHIM PLATES IF REQUIRED FOR THE INSTALLATION OF THE INVERSET UNITS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE BEARINGS.

BEARINGS INSTALLATION AND ALIGNMENT NOTES:

THE CENTERLINE OF SOLE PLATE OR OTHER FIXED PORTIONS OF THE BEARING ASSEMBLY, ATTACHED TO THE STEEL GIRDERS SHALL NOT BE OFFSET FROM THE CENTERLINE OF THE BEARING STIFFENERS OR DIAPHRAGM CONNECTION PLATES BY MORE THAN ONE-HALF THE FLANGE THICKNESS AT THAT LOCATION, OR THE THICKNESS OF THE BEARING STIFFENERS OR CONNECTION PLATE, WHICHEVER IS AT A LESSER DISTANCE.

THE MAXIMUM VARIATION FROM PERFECT ALIGNMENT UNDER FULL DEAD LOAD SHALL NOT EXCEED 4 mm. THIS VARIATION SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CENTERLINE OF THE HIGHEST ELASTOMER SURFACE AND THE CENTERLINE OF THE LOWEST ELASTOMER SURFACE.

ELASTOMERIC BEARING TABLE

(ALL DIMENSIONS ARE IN MILLIMETERS)

LOCATION	BEARING MARK	FIX. / EXP.	ITEM NO.	QUAN. REQ'D.	ELASTOMER			SOLE PLATE				BASE PLATE									WASHER PLATE		BRG.	ANCHOR BOLTS		WELD SIZE	ØS	PIN DIA. ØP	DESIGN DL + SDL (KN)	DESIGN LL W/O IMP (KN)	MAX. DESIGN REACTION (KN)	SHAPE FACTOR
					LAYERS N	LM	WM	C	D	T1	T2	FM	GM	T3	E1	E2	EL	AM	BM	ØM	AWP	BWP	H	Ø	BOLTS PER BRG.	W						
B1, B2, B3, B4 @ PIER 1	E1	EXP.	565.2031M	4	2	250	250	280	740	50	63	300	880	30	40	30	55	60	30	---	90	60	114	19	4	8	21	---	106	50	156	5.2
B1, B2, B3, B4 @ PIER 2	E2	FIX.	565.2022M	4	2	250	450	280	740	40	53	300	880	30	40	30	55	60	30	---	90	60	104	19	4	8	21	38	229	93	322	6.7
B1, B2, B3, B4 @ PIER 3	E3	EXP.	565.2031M	4	2	250	200	280	740	66	79	300	880	35	40	30	55	60	30	---	90	60	135	19	4	8		---	115	16	131	4.6

AS-BUILT REVISIONS

SIGNATURE DATE

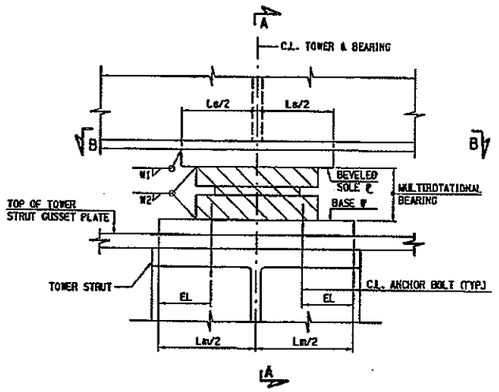
WEST APPROACH BEARINGS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

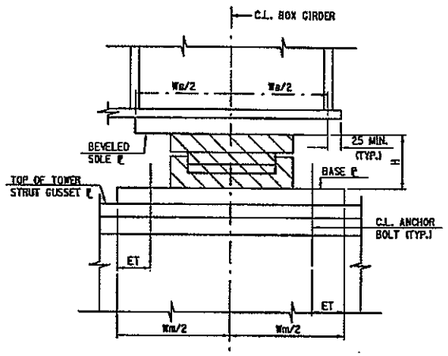
DWG. NO.	DATE	SCALE	
SSD-20	DEC. 2000	AS SHOWN	EARTH TECH

DESIGNED BY: NS
CHECKED BY:
IN CHARGE OF:
ESTIMATED BY:
CHECKED BY: JB
DRAFTED BY: DC
CHECKED BY: JM
JM1TAB2ZID
D:\CAD\BRIDGES\PSEC\W24X24CP.SLB
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D:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PHINTER.PLT

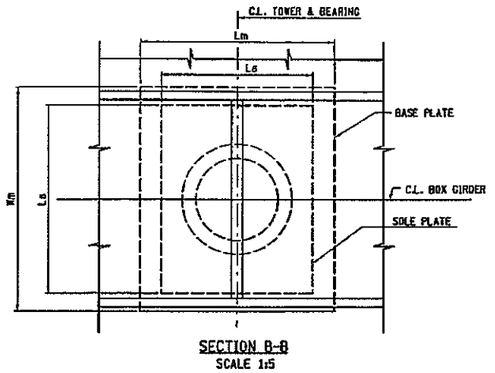
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	56	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



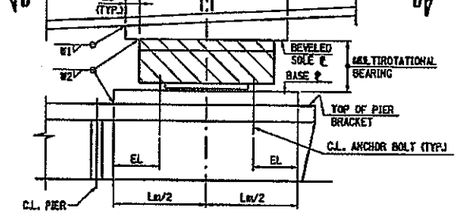
ELEVATION OF FIXED BEARING AT C.L. TOWER (PIER 4)
SCALE 1:5



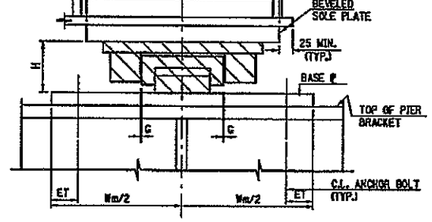
SECTION A-A
SCALE 1:5



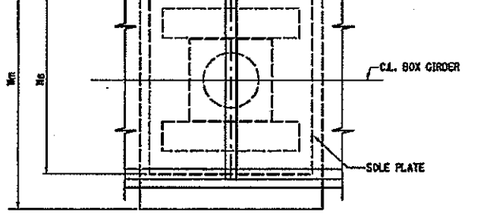
SECTION B-B
SCALE 1:5



ELEVATION OF EXPANSON BEARING AT C.L. PIER 3&5
SCALE 1:5



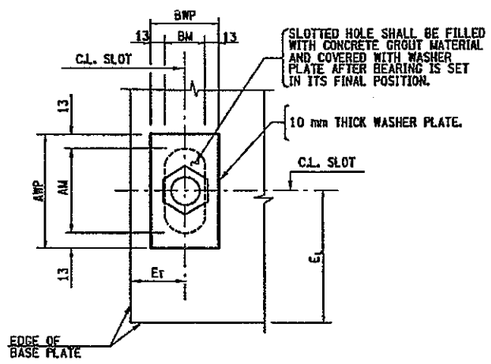
SECTION C-C
SCALE 1:5



SECTION D-D
SCALE 1:5

BEARING TABLE (ALL DIMENSIONS ARE IN MILLIMETERS)

LOCATION	FIX/EXP.	ITEM NO.	QUAN. REQ'D.	CAPACITY VERTICAL (KN)	CAPACITY TRANSVERSAL (KN)	CAPACITY LONGITUDINAL (KN)	ROTATION RAD	ONE WAY LONGIT MOVEMENT	GUIDE CLEARANCE (G)	BASE PLATE L_m	BASE PLATE W_m	BASE PLATE T	SOLE PLATE L_S	SOLE PLATE W_S	SOLE PLATE T	BRG. H	ANCHOR BOLTS ø	ANCHOR BOLTS E_T	ANCHOR BOLTS E_L	WELD SIZE W_1	WELD SIZE W_2	ANCHOR ℄ AWP	ANCHOR ℄ BWP
TOWER (PIER 4)	FIXED	565.1721N	2	250	150	450		—	—	360	415	30	280	350	30	110	32	60	95	10	10	98	68
PIER 3,5	EXP.	565.1521N	4	100	150			12	2	340	425	25	300	350	25	105	25	50	85	8	8	91	61



TYPICAL ANCHOR BOLT SLOTTED HOLE DETAIL
N.T.S.

NOTES:

THE CONTRACTOR SHALL SUPPLY MULTI-ROTATIONAL STRUCTURAL BRIDGE BEARINGS CONFORMING TO THE REQUIREMENTS OF BEARING ITEMS SHOWN AND SUBJECT TO THE FOLLOWING CONDITIONS:

1. THE BEARING DEVICES SUPPLIED SHALL BE CAPABLE OF TRANSMITTING THE LOADS AND MOVEMENT SHOWN ON THESE PLANS.
2. THE DIMENSION "H" IN THE BEARING TABEL REPRESENTS THE ASSUMED TOTALHEIGHT OF BEARING MECHANISM BETWEEN THE SOLE PLATE AND BASE PLATE USED BY THE DESIGNER TO ESTABLISH TOP OF PIER ELEVATIONS.
3. THE BEARING DEVICE, BASE PLATE, SOLE PLATE, ANCHOR BOLTS, NUTS, WASHER PLATES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE BEARING ITEMS.
4. ALL EXPANSION BEARINGS SHALL HAVE A MAXIMUM FRICTION CEFFICIENT OF 3%.
5. IF THE ANCHOR BOLTS ARE SET UNDER THE SOLE PLATE, A MINIMUM CLEARANCE EQUAL TO TWO TIMES THE THICKNESS OF ANCHOR NUT PLUS 25mm SHALL BE MAINTAINED BETWEEN THE TOP OF BASE PLATE AND BOTTOM OF THE SOLE PLATE.
6. ALL STEEL SHALL CONFORM TO A709 G345.
7. ALL METAL COMPONENTS OF THE BEARING SYSTEM WHICH ARE LIABLE TO COME INTO CONTACT DURING THE TRANSLATION SHALL HAVE A TEFLON SLIDING SURFACE FINISH.
8. ALL STEEL FABRICATION SHALL CONFROM TO THE PROVISIONS OF THE LATEST EDITION OF THE NEW YORK STATE STEEL CONSTRUCTION MANUAL.
9. THE TRANSVERSE AND LONGITUDINAL BEARING DESIGN LOADS REPRESENT EARTHQUAKE LOADING.
10. BASE PLATE, WASHERS, WASHER PLATES, ANCHOR PLATES AND NUTS SHALL MEET THE REQIREMENTS OF SUBSECTION 723-60. THEY SHALL BE GALVAIZED IN ACCORDANCE WITH THE REQUIREMENTS OF MATERIAL SPECIFICATION SUBSECTION 719-01. "GALVANIZED COATINGS AND REPAIR METHODS". THIER COST (INCLUDING GALVANZING) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BEARING ITEM.

BEARING INSTALLATION AND ALIGNMENT

THE CENTERLINE OF SOLE PLATES OR OTHER FIXED PORTIONS OF BEARING ASSEMBLIES ATTACHED TO STRUCTURAL STEEL SHALL NOT BE OFFSET FROM THE CENTERLINE OF BEARING STIFFENERS OR DIAPHARGM CONNECTION PLATES BY MORE THAN ONE-HALF THE THICKNESS OF THE FLANGE AT THAT LOCATION, OR THE THICKNESS OF BEARING STIFFENER OR CONNECTION PLATE, WHICHEVER IS THE LESSER DISTANCE.

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
BEARING DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-21	DEC. 2000	AS SHOWN	

DRAFTED BY: JO CHECKED BY: DC
DESIGNED BY: RH CHECKED BY: JB
IN CHARGE OF: NS ESTIMATED BY: JH

BJORKMAN
12 DEC 2000
C:\WORK\32822\RADIUS\INTREPID-BRIDGE\ADP\X032422EA.SLI
C:\WORK\32822\RADIUS\DRAWINGS\STATION\PLOTDRV\PRINTER.PLT

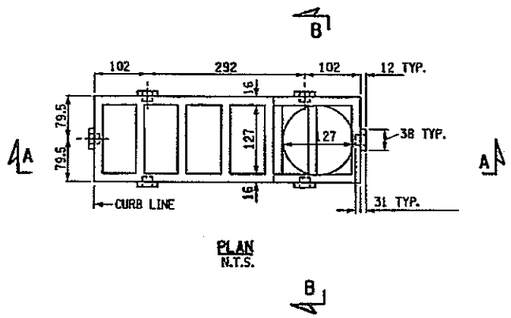
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	57	142

ROUTE 9A RECONSTRUCTION PROJECT

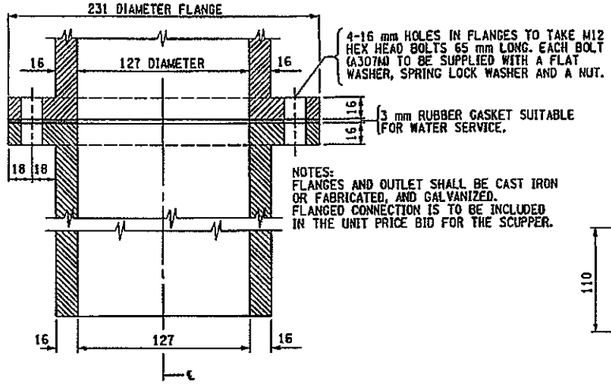
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

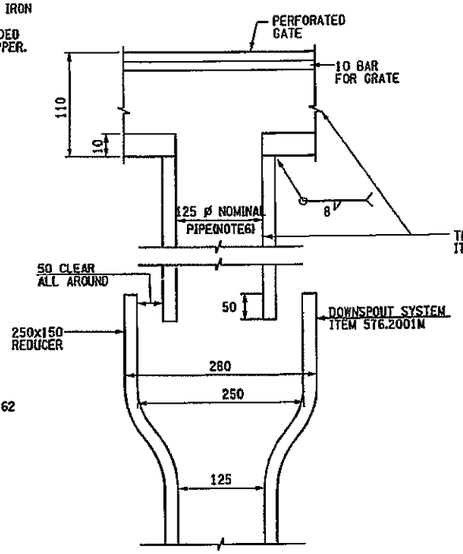
NEW YORK COUNTY — PIN: X024.22



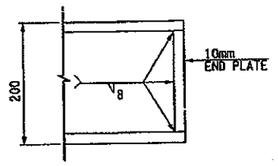
PLAN
N.T.S.



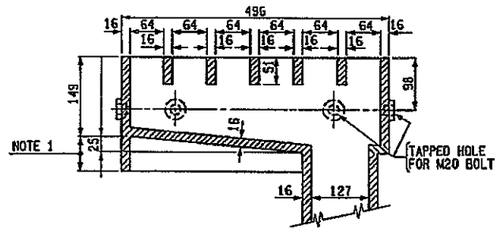
FLANGED CONNECTION FOR OUTLETS



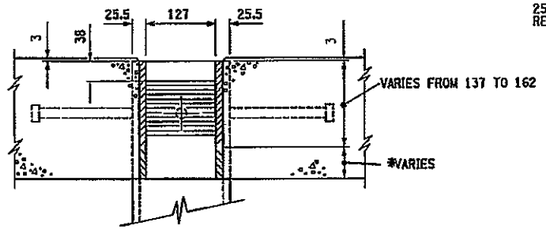
SECTION D-D
N.T.S.



SECTION E-E
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B

NOTES:

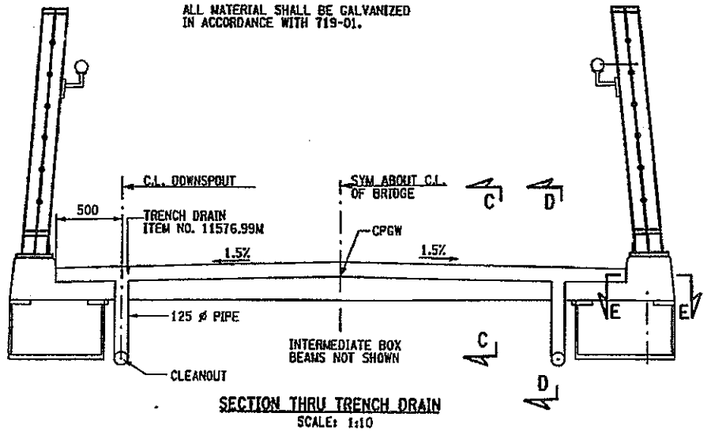
1. DIMENSION REUIRED TO LOCATE BOTTOM OF SCUPPER FLUSH WITH BOTTOM SURFACE OF SLAB AND TOP OF SCUPPER 3mm BELOW TOP SURFACE OF SLAB.
2. IF SCUPPERS ARE LOCATED IN HAUNCH AREAS ABOVE BEAMS, THE SCUPPERS SHALL BE BLOCKED UP OFF THE FORMS SO AS TO LOCATE TOP OF SCUPPER 3 mm BELOW TOP SURFACE OF SLAB AS SHOWN.
3. STRCTURAL SLAB CONCRETE IMMEDIATELY ADJACENT TO SCUPPERS SHALL BE THOROUGHLY VIBRATED DURING PLACEMENT TO ELIMINATE VOIDS WHICH COULD RESULT IN PREMATURE CONCRETE DETERIORATION.
4. THE CONTRACTOR SHALL PROVIDE A PERFORATED GRATE WITH THE SCUPPERS AND TRENCH DRAIN. THE OPEN AREA SHALL BE AT LEAST 50% OF THE PLATE AREA. THE GRATING AND METHOD OF ATTACHMENT SHALL SUBMITTED TO THE TO THE ENGINEER FOR APPROVAL. COST TO BE INCLUDED IN THE UNIT PRICE BID FOR TYPE A1 SCUPPERS AND TRENCH DRAIN.
5. FOR ADDITIONAL INFORMATION SEE DWG. NO. SSD-17 & SSD-23.
6. LENGTH OF PIPE TO BE WELDED TO THE TRENCH DRAIN SHALL BE DETERMINED BY THE CONTRACTOR AND SHOWN ON THE SHOP DRAWINGS.

SCUPPER-TYPE "A1"
(ITEM 576.0140)

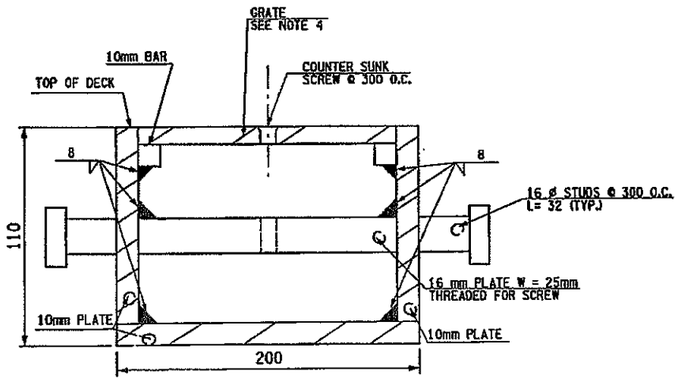
EACH SCUPPER TO BE FURNISHED WITH 6-M20 BOLTS, (A307M), 200 mm LONG.

SCUPPER AND PIPE SHALL BE CAST IRON OR FABRICATED.

ALL MATERIAL SHALL BE GALVANIZED IN ACCORDANCE WITH 719-01.



SECTION THRU TRENCH DRAIN
SCALE: 1:10



SECTION C-C
N.T.S.

AS-BUILT REVISIONS

SIGNATURE — DATE

DRAINAGE DETAILS
WEST APPROACH AND MAIN SPAN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-22	DEC. 2000	AS SHOWN	

ESTIMATED BY: A.K. — CHECKED BY: J.M. — DRAFTED BY: P.G. — CHECKED BY: J.B. — DESIGNED BY: J.M. — IN CHARGE OF: N.S.

BJORKMAN
12 DEC 2000
L:\BRK\2282\CADD\INTREPID-BRIDGE\PSBS\X282422CP.DIB
C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT

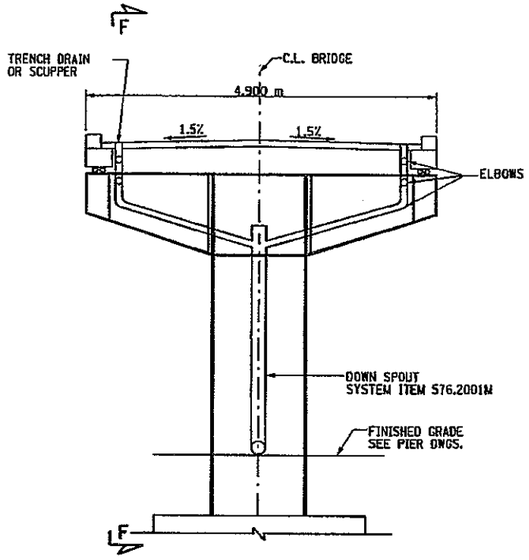
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	58	142

ROUTE 9A RECONSTRUCTION PROJECT

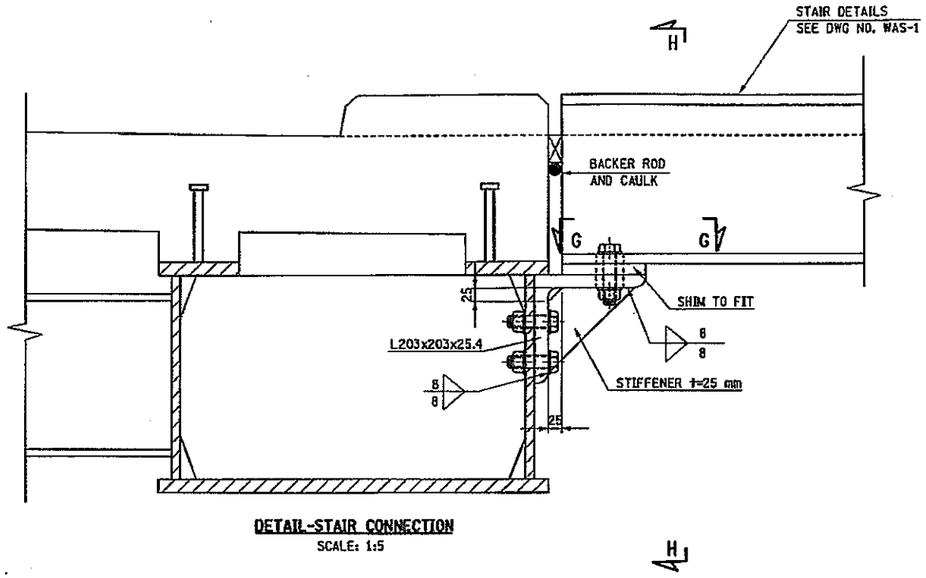
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

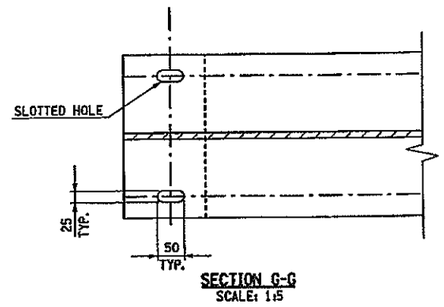
NEW YORK COUNTY PIN: X024.22



WEST ELEVATION DRAINAGE SYSTEM AT PIER 1
(OTHER PIERS SIMILAR)
N.T.S.

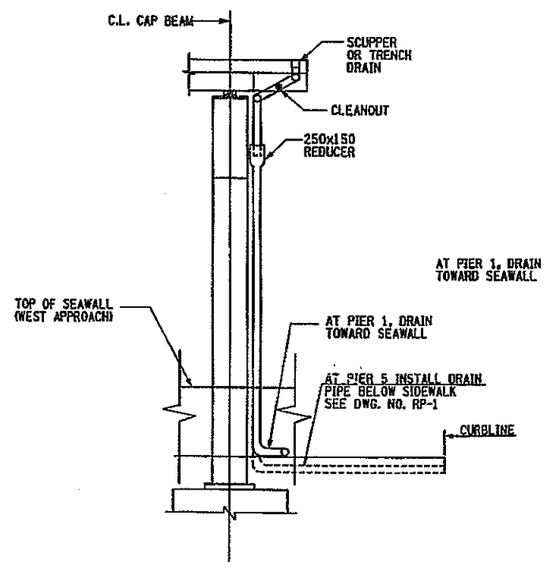


DETAIL-STAIR CONNECTION
SCALE: 1:5

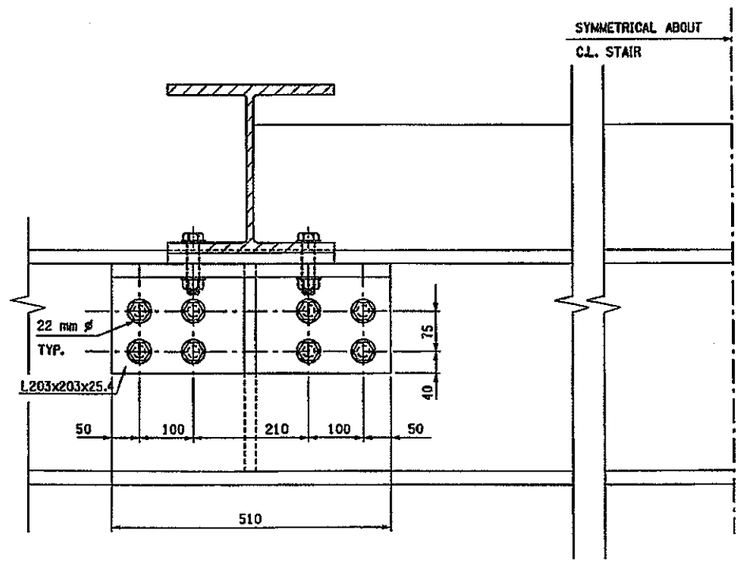


SECTION G-G
SCALE: 1:5

NOTE:
CAULK SHALL CONFORM TO SECTION 705.03. THE COST FOR FURNISHING AND INSTALLING BACKER ROD AND CAULK SHALL BE INCLUDED IN ITEM 557.01M



SECTION F-F
N.T.S.



SECTION H-H
SCALE: 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

DRAINAGE DETAILS - 2
MISCELLANEOUS DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
SSD-23	DEC. 2000	AS SHOWN	EARTH TECH

ESTIMATED BY: J.M. CHECKED BY: P.G. DRAFTED BY: J.M. CHECKED BY: A.K. DESIGNED BY: J.M. CHECKED BY: J.B. IN CHARGE OF: R.S.

PLOTTED BY: JORDYSM
PLOT DATE: 12/8/2000
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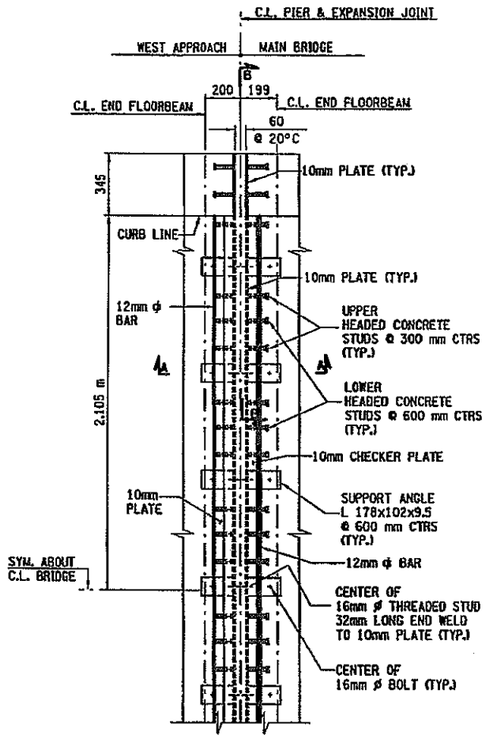
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	59	142

ROUTE 9A RECONSTRUCTION PROJECT

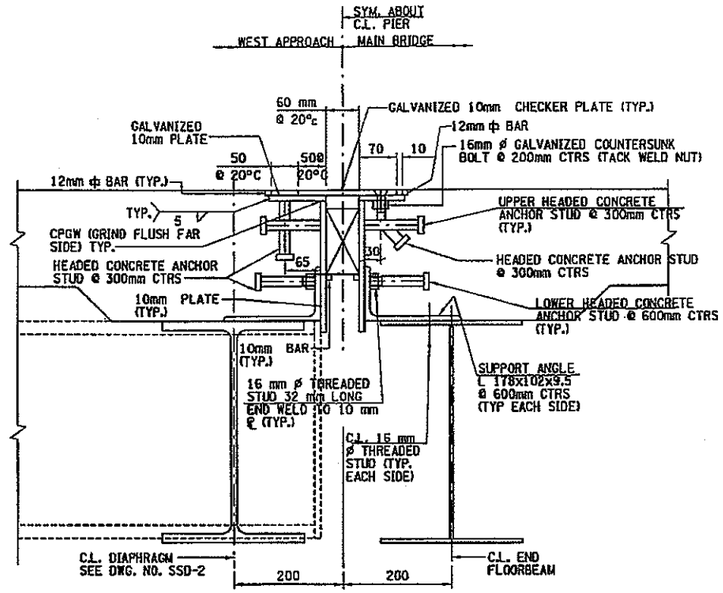
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



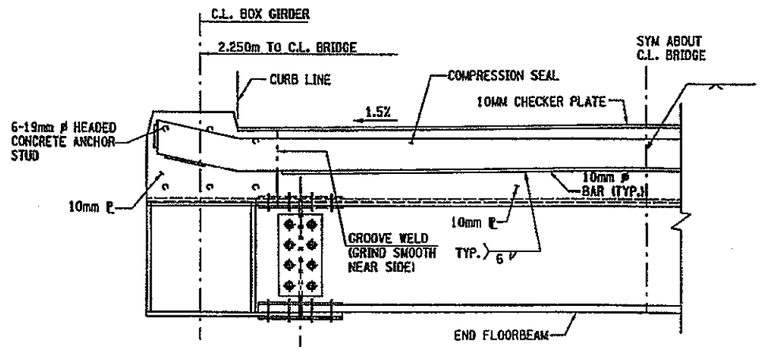
PLAN VEIW OF EXPANSION JOINT AT PIER 3
(PIER 5 SIMILAR)
SCALE 1:15



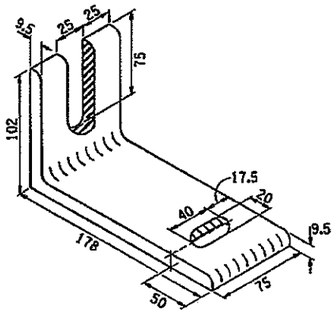
SECTION A-A
SCALE 1:5

NOTE:

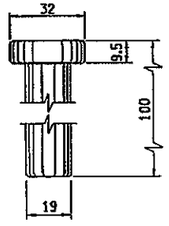
1. EXPANSION JOINT SHALL BE PAID UNDER ITEM 567.36M
2. DEPTH OF NEOPRENE COMPRESS SEAL SHALL BBE INDICATED ON SHOP DRAWING AND SHALL BE SUCH THAT WHEN THE SEAL IS COMPRESSED TO 50% OF IT'S NORMAL WIDTH THE TOP OF THE SEAL SHALL BE NOT LESS THAN 6mm NOR MORE THAN 19mm BELOW THE BOTTOM OF PLATE.
3. NEOPRENE SEAL SHALL BE SUPPLIED IN ONE PIECE FOR FULL LENGTH OF EACH JOINT. SPLICES WILL NOT BE PERMITTED.
4. THE NOMINAL WIDTH OF THE SEAL SHALL BE 102.
5. THREADED STUDS SHALL CONFORM TO SECTION 709.05. THE COST SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 567.36M.



SECTION B-B
SCALE 1:10



DETAIL OF SUPPORT ANGLE (ASTM A36M)
NOT TO SCALE



DETAIL OF HEADED CONCRETE ANCHOR STUD
NOT TO SCALE

AS-BUILT REVISIONS

SIGNATURE DATE

MAIN SPAN
EXPANSION JOINT DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
SSD-24	DEC. 2000	AS SHOWN	

J.M. DRAFTED BY: P.G. CHECKED BY: J.H. CHECKED BY: A.K. ESTIMATED BY: J.D. CHECKED BY: R.H. DESIGNED BY: N.S. IN CHARGE OF:

BJORKMAN
12 DEC. 2000
C:\MENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PLOTDRV.DGN

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	60	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

PHYSICAL BULKHEAD

610mm RCP CL. IV
ECS-TP502
9/23/96"
13'x4'-3"
(3.96mx1.30m)

305mm DIP

457mm DIP

381mm

1.22m DIAM. R.C. SEWER

ARY CONNECTION TO PIER

PIER 86

1.98m X 2.59m FTRC SEWER

1.98m X 2.59m FTRC SEWER

4 NPS DOMESTIC WATER

PROPOSED INTREPID MUSEUM VISITOR'S CENTER

8 NPS FIRE

8 NPS LPW SERVICE TO PIER 86

EXPANSION JOINT TYPE A-6

C.L. TRENCH DRAIN E
STA. 0+941.21

TRENCH DRAIN

0+950 2E

0+970

0+990

PHYSICAL BULKHEAD

ASPHALT WALKWAY

ASPHALT BIKEWAY

STEPOUT

WEST SIDE STAIR

C.L. PIER 1
STA. IB 0+942.72

C.L. PIER 2
STA. IB 0+960.720

C.L. PIER 3
STA. IB 0+978.720

305mm DIP

LS

4 NPS LPW

8 NPS FIRE

8 NPS LPW

EQUALITY
STA. S 8+371.370=
STA. IB 1+000.000

C.L. SCUPPER
STA 0+980.22

SCUPPER

305 CURB

4.3 m

305 CURB

B4

B5

C4

A4

B6

C6

A6

GATE CHAMBER N-37

S 8-400

S 8-400

S 8-400

S 8-400

ABANDONED 1.22m x 1.22m FTRC
12 NPS LPW

12 NPS G

T.P. #14

T.P. #48

T.P. #5

T.P. #4

T.P. #46

T.P. #13

AZ 298°59'11.4"

STA. N 8+398.976
W. 46th STA. #1+000

1.22m x 1.22m RCP SEWER

1.22m O RCP SEWER

6 NPS G

W. 46th STREET

4T

W. 46th ST

CURBLIN

170

RAMP

AZ 298° 50' 59.48"

AZ 28°50'59.48"

335

STA.1+032.79

NOTE:
FOR GRADING AND DRAINAGE PLAN FOR BUS LAYOVER AREA, SEE DWG. NO. BLA-3

EAST TOUCHDOWN
SEE DWG. NO. TD-1

EQUALITY
STA. N 8+371.380=
STA. IB 1+000.000

TOL & STATION LINE
INTREPID PEDESTRIAN
BRIDGE

EXPANSION JOINT TYPE A-6

C.L. SCUPPER
STA 1+025.780

C.L. PIER 4
STA. IB 1+053.000

C.L. PIER 5
STA. IB 1+027.280

PLANTED MEDIAN (BY OTHERS)

PLANTED MEDIAN (BY OTHERS)

AZ 298°59'11.4"

AZ 298°50'59.48"

INTERCEPTING SEWER

C.I. SEWER

NPS O.D. ST HPP (69KV)

2-6 NPS O.D. ST HPP (34.5KV)
6 NPS H.E.P

12 NPS LPW

12 NPS G

MSC

LEGEND

EXISTING UTILITIES

"FUTURE EXISTING" UTILITIES BUILT UNDER SEG. 7 CONTRACT

AS-BUILT REVISIONS

SIGNATURE DATE

DRAINAGE AND UTILITY PLAN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
DU-1	DEC. 2000	1:150

EARTH TECH

J.N. CHECKED BY: A.R. DRAFTED BY: CHECKED BY: ESTIMATED BY: N.S. CHECKED BY: A.R. DESIGNED BY: N.S. IN CHARGE OF:

PLOTTED: 12/18/00 12:23:23
C:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER.PLT
C:\BENTLEY\WORKSPACE\PROJECTS\INTREPID_BRIDGE\ADP\X82422CA-01A

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	61	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

TEST PIT DATA

No.	COORDINATES NORTH	COORDINATES EAST	DUCT BANK SIZE W x D	ELEV. *
1.	66367.0558	300057.6333	.5090m x .5090m	-0.19
2.	66352.4142	300083.9993	.3556m x .3556m	0.833
3.	66338.8950	300108.2078	.7112m x .7112m	1.874
4.	66374.4468	300054.4096	.4328m x .4328m	-0.25
5.	66365.8928	300070.1976	.4328m x .4328m	0.32

* ELEVATION GIVEN AT TOP OF DUCT BANK
W = WIDTH OF DUCT BANK
D = DEPTH OF DUCT BANK

PIER 86

PROPOSED INTREPID MUSEUM VISITOR'S CENTER

2- EXISTING CON EDISON DUCTS

SEE DWG NO. DU-3 FOR CONTINUATION

EQUALITY STA. S 8+371.370= STA. IB 1+000.000

EQUALITY STA. N 8+371.380= STA. IB 1+006.000

TGL & STATION LINE INTREPID PEDESTRIAN BRIDGE

S 8+400

N 8+400

STA. N 8+396.975 W 46th STA. 1+000

AZ 298°59'11.4" W. 46th STREET

AZ 28°59'15"

PLANTED MEDIAN

305 CURB

RAMP

170

335

C.L. TRENCH DRAIN STA. 0+941.21

TP4

TP5

TP1

TP2

TP3

0+950

0+970

0+990

1+010 AZ 118°50'59.48"

4.500

STA.1+032.79

PHYSICAL BULKHEAD

FACE OF BUILDING/END OF BRIDGE STA. IB 0+939.910

2 EXISTING CON ED DUCTS (CONCRETE ENCASED)

ASPHALT BALKWAY

ASPHALT BIKEWAY

GRANITE PAVER STEPOUT

4 EXISTING CON ED DUCTS (2 ACTIVE LINES AND 2 INACTIVE - SEE DWG DU-3)

SEE DWG NO. DU-3 FOR CONTINUATION

EAST TOUCHDOWN SEE DWG. NO. TD-1

C.L. PIER 1 STA. IB 0+942.72

C.L. PIER 2 STA. IB 0+960.720

C.L. PIER 3 STA. IB 0+978.720

C.L. PIER 4 STA. IB 1+003.000

C.L. PIER 5 STA. IB 1+027.280

WEST SIDE STAIR

C.L. STAIRS STA. 0+973.150

PLAN

NOTE:
1. SEE DWG NO. DU-3 FOR COMPLETE SUBSURFACE UTILITIES INFORMATION

WEST APPROACH

MAIN SPANS

C.L. PIER 1

C.L. PIER 2

C.L. PIER 3

C.L. PIER 4

C.L. PIER 5

38.81 m

48.56 m

18.0 m

18.0 m

24.28 m

24.28 m

PROPOSED INTREPID MUSEUM VISITOR'S CENTER

2ND FLOOR EL. 6.087

FIN FLOOR EL. 1.820

EL. 1.5

EL. 1.4

EL. 1.0

5.686 m

EXISITNG SB ROUTE 9A

EXISTING NB ROUTE 9A

EL. 2.17

5.334 m

H.P.

EXISTING CON EDISON DUCTS SEE DWG NO. DU-3 FOR CONTINUATION

ELEVATION

■ - TEST PIT LOCATION EXCAVATED SEPTEMBER/ OCTOBER 1999

AS-BUILT REVISIONS

SIGNATURE DATE

PARTIAL LOCATION OF CON EDISON ELECTRICAL DUCTS

STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
DU-2	DEC. 2000	1:200	EARTH TECH

ESTIMATED BY: J.M. CHECKED BY: P.G. DRAFTED BY: J.M. CHECKED BY: J.M. DESIGNED BY: N.S. IN CHARGE OF:

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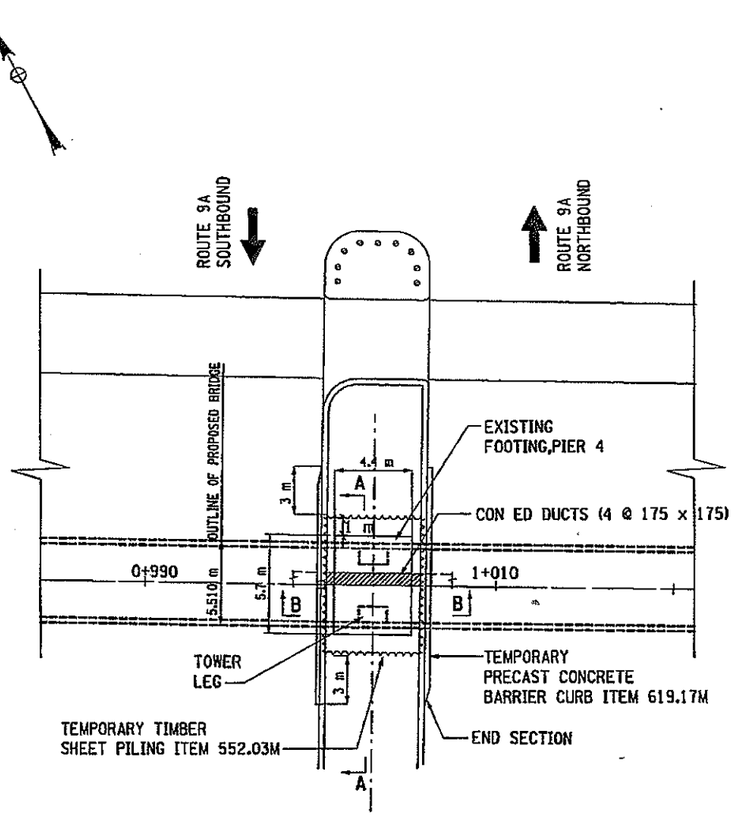
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	62	142

ROUTE 9A RECONSTRUCTION PROJECT

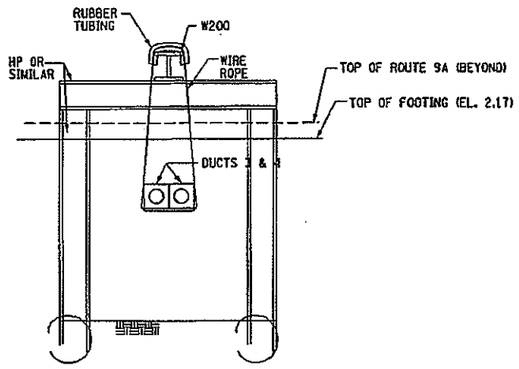
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

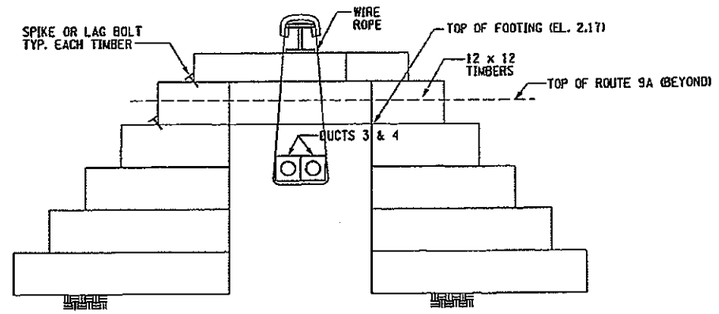
NEW YORK COUNTY — PIN: X024.22



PLAN



SECTION A-A

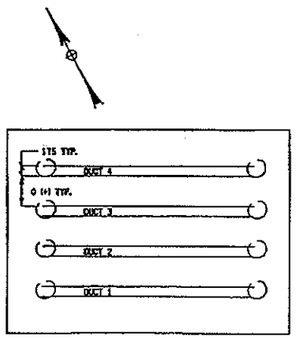


ALTERNATE SECTION A-A
(TIMBER GRILLAGE)

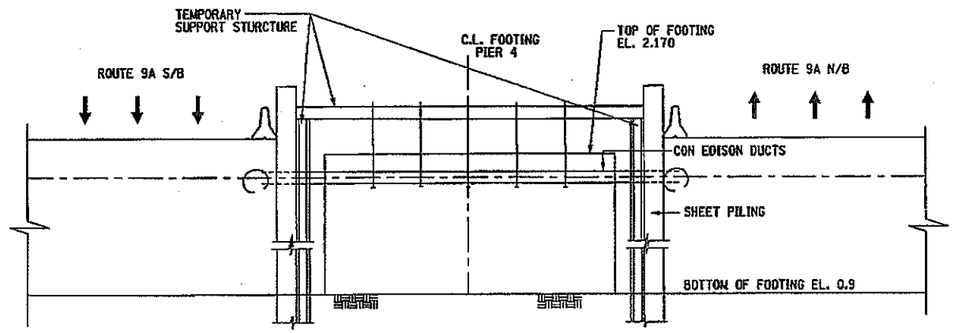
THIS WORK NOT-IN-CONTRACT

NOTES:

1. TEMPORARY SUPPORT SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL (SEE GENERAL NOTES)
2. ONLY HAND EXCAVATION SHALL BE PERMITTED WITHIN 600 mm OF THE DUCTS.
3. DUCTS 1 AND 2 DO NOT CONTAIN CABLE AND SHALL BE REMOVED.
4. CUT WIRE SLINGS AFTER CONCRETE HAS HARDENED AND PATCH TOP OF FOOTING.
5. ALL COSTS FOR THE ABOVE WORK SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 206.01 M - STRUCTURE EXCAVATION.



DUCT LAYOUT



SECTION B-B

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

SUGGESTED TEMPORARY SUPPORT FOR CON EDISON ELECTRICAL DUCTS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
DU-3	DEC. 2000	N.T.S	EARTH TECH

J.M. — CHECKED BY: — P.G. — DRAFTED BY: — CHECKED BY: — N.S. — ESTIMATED BY: — CHECKED BY: — J.M. — DESIGNED BY: — N.S. — IN CHARGE OF: —

PGN=BLE
L:\1\0\83\32832\CADD\INTREPID-BRIDGE\ADD\V832422CA.003
C:\BENTLEY\WORKSPACE\SYSTEM\PLOTDRV\PRINTER1.PLT

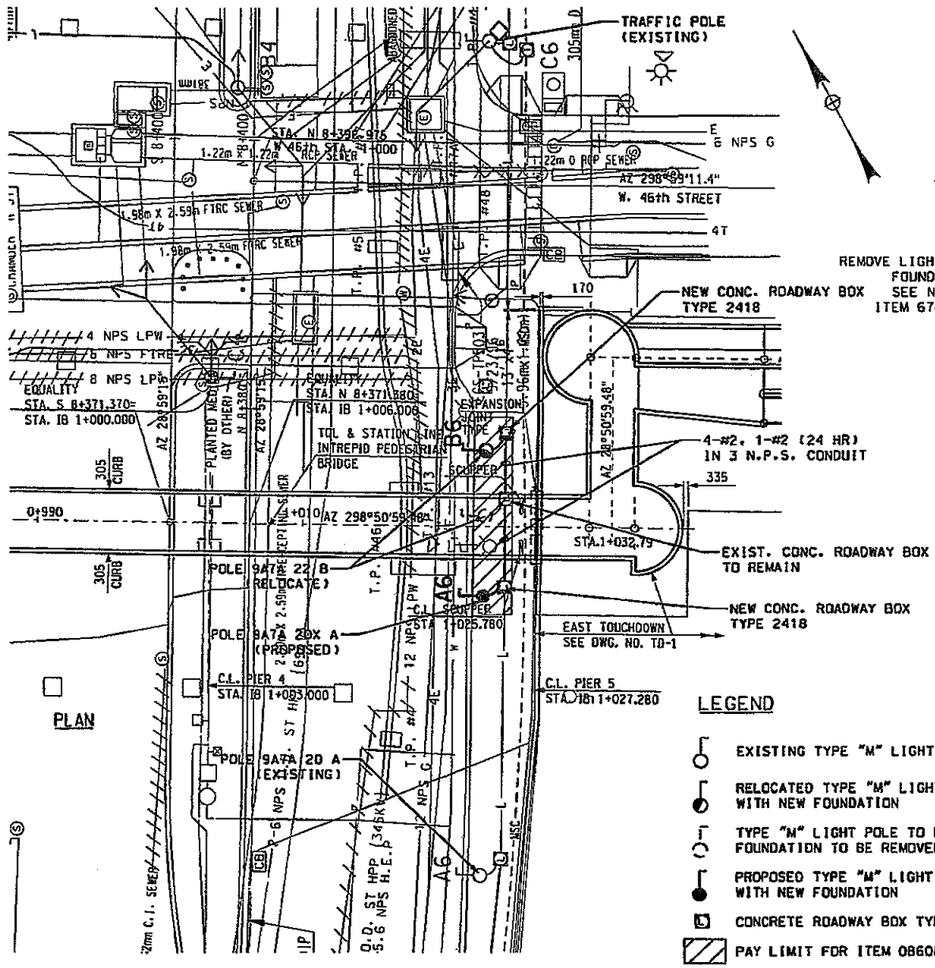
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	63	142

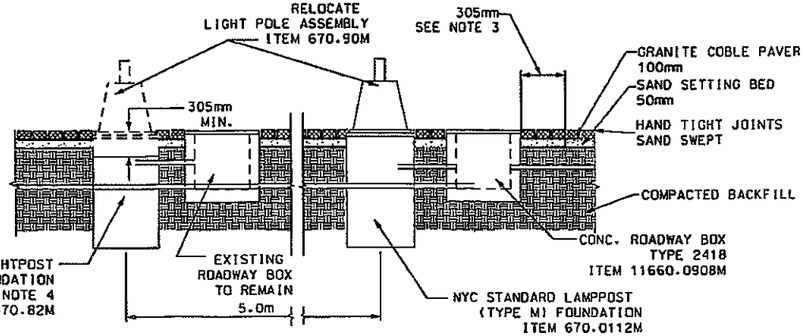
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

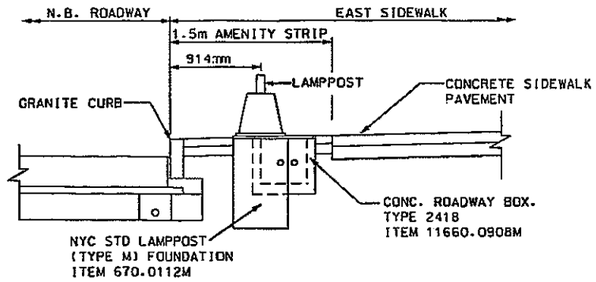
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024-22



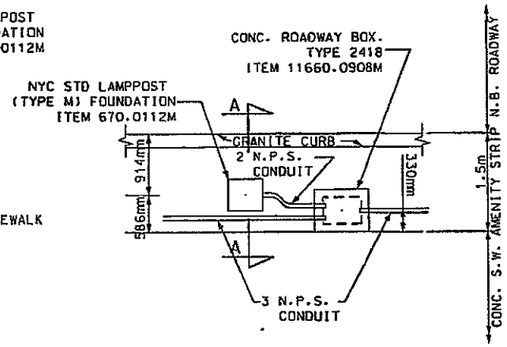


POLE RELOCATION & RESTORATION



TYPICAL SECTION AT EAST SIDEWALK

SECTION A-A



TYPICAL PLAN AT EAST SIDEWALK

LEGEND

- EXISTING TYPE "M" LIGHT POLE
- RELOCATED TYPE "M" LIGHT POLE WITH NEW FOUNDATION
- TYPE "M" LIGHT POLE TO BE RELOCATED. FOUNDATION TO BE REMOVED (SEE NOTE 4)
- PROPOSED TYPE "M" LIGHT POLE WITH NEW FOUNDATION
- CONCRETE ROADWAY BOX TYPE 2418
- PAY LIMIT FOR ITEM 08608.1008M

NOTES:

1. EXPANSION JOINT SPACING FOR BLOCK PAVER RESTORATION SHALL NOT EXCEED 6.0m.
2. NEW GRANITE PAVERS TO MATCH THOSE USED ON SEGMENT 7.
3. PAY LIMIT FOR RESTORATION OF GRANITE PAVERS (ITEM 08608.1008M) SHALL EXTEND A MAXIMUM OF 305mm BEYOND THE PROPOSED STRUCTURE (PULL BOX OR FOUNDATION) AND ENCOMPASS THE FULL WIDTH OF THE AMENITY STRIP (1.5M WIDE). PLACEMENT OF SAND SETTING BED AS WELL AS COMPACTED BACKFILL SHALL BE INCLUDED UNDER ITEM 08608.1008M.
4. THE CONTRACTOR HAS THE OPTION (A.O.B.E.) OF REMOVING THE FOUNDATION A MIN. 305mm BELOW FINAL GRADE OR REMOVING THE FOUNDATION COMPLETELY. NO SEPARATE PAYMENT WILL BE MADE FOR ADDITIONAL BACKFILL INVOLVING THE FULL REMOVAL OF THE FOUNDATION.
5. FOR ELECTRICAL/LIGHTING WORK INVOLVING THE BUS LAYOVER AREA. SEE DWGS. BLA-4 AND BLA-19.

TABLE OF PROPOSED LIGHTING WORK FOR ROUTE 9A

FROM					TO			FOUNDATION	LAMPPOST	LUMINAIRE	CONDUIT		CONDUCTOR		PULL BOXES	
POLE/BOX I.D.	APPROX. CENTERLINE STATION	OFFSET & SIDE	PHASE	CIRCUIT	POLE/BOX I.D.	PHASE	CIRCUIT	ITEM 670.0112M FND, NYCDOT TYPE M (EACH)	ITEM 11670.1080M TYPE M LAMPPOST (EACH)	ITEM 11670.5110M 250W HPS, TEARDROP LUMINAIRE (EACH)	ITEM 11660.0106M CONDUIT, HOT DIPPED GALV. STEEL 2 N.P.S. (METER)	ITEM 11660.0108M CONDUIT, HOT DIPPED GALV. STEEL 3 N.P.S. (METER)	11661.0306M NO. 2 AWG CONDUCTOR (METER)	ITEM 10206.0301M CONDUIT EXCAV. BACKFILL (METER)	ITEM 11660.0908M ROADWAY BOX TYPE 241B (BG&E) (EACH)	REMARKS
9A7A 20 A	8+345.5	17.4M R	A	6	9A7A 20X A	A	6									
9A7A 20X A	8+366.2	17.4M R	A	6	9A7A 22 B	B	6	1	1	1	2	10	52	12	1	
9A7A 22 B	8+377.1	17.4M R	B	6	TRAFFIC	C	6	1			2	5	28	7	1	RELOCATE LIGHT POLE ITEM 670.90M
TRAFFIC	8+406.2	17.4M R	C	6	N/A											
					TOTALS:			2	1	1	4	15	80	19	2	

AS-BUILT REVISIONS

SIGNATURE — DATE

RELOCATION OF TYPE M LAMP POST ALONG N/B ROUTE 9A

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
DU-4	DEC 2000	1:200

LiRo-Kessner, Inc.

EARTH TECH

DESIGNED BY: SH/MB — DRAFTED BY: MC/MB/SH — CHECKED BY: GK — CHECKED BY: KH — ESTIMATED BY: SH/MB — CHECKED BY: KH — IN CHARGE OF: RP

USER
MAY 2000
X02422CA, DU4

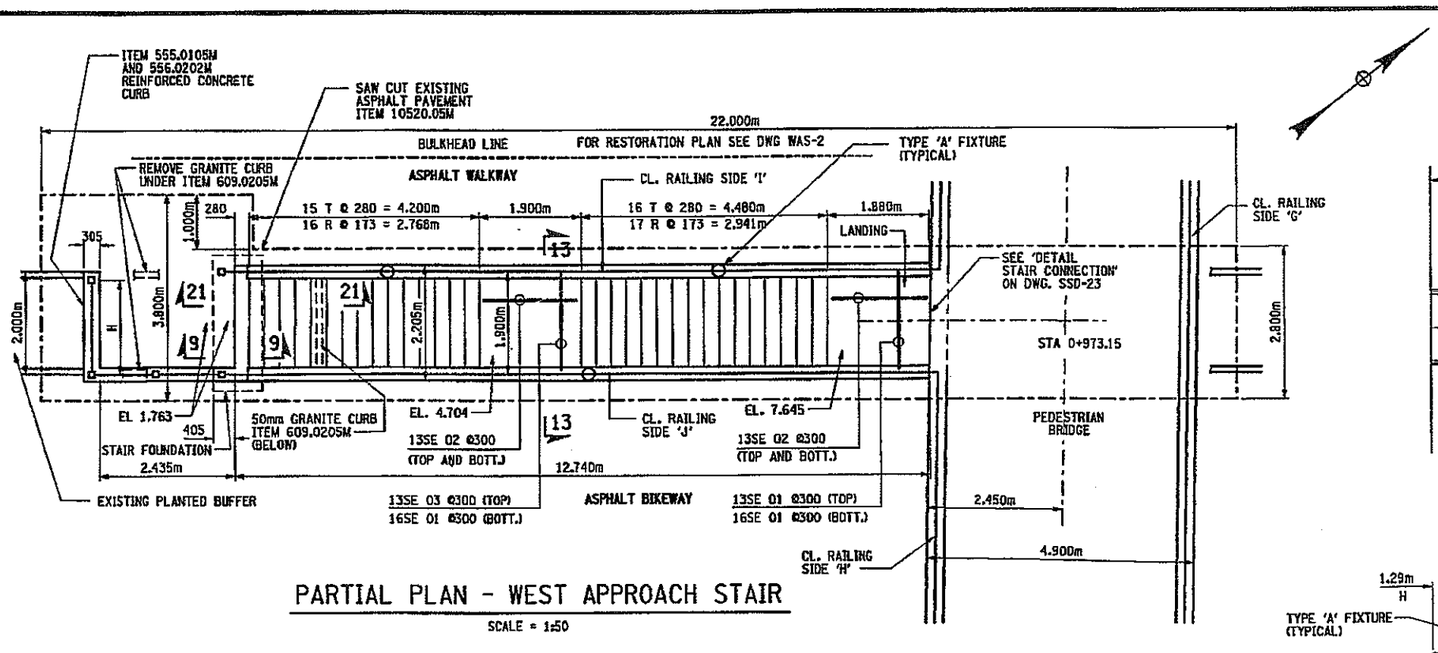
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	64	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

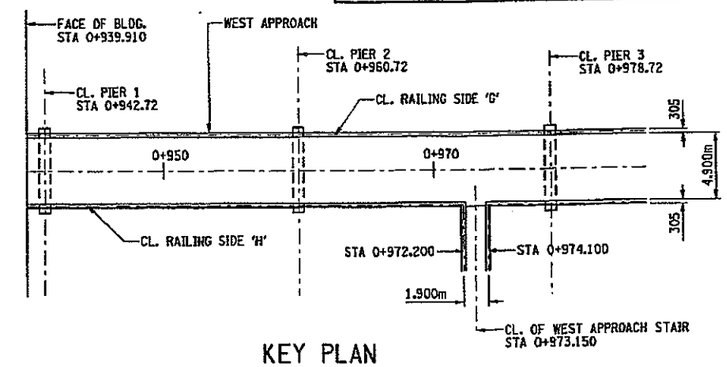
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

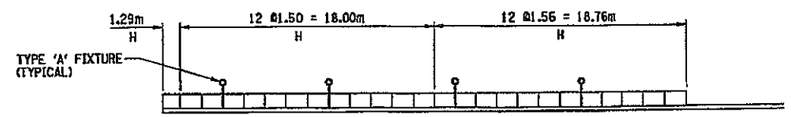


PARTIAL PLAN - WEST APPROACH STAIR

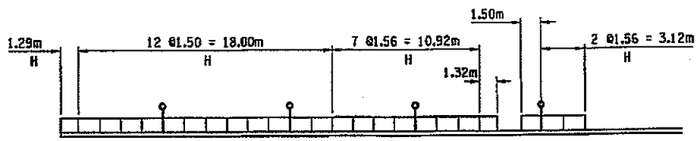
SCALE = 1:50



KEY PLAN



SIDE 'G'

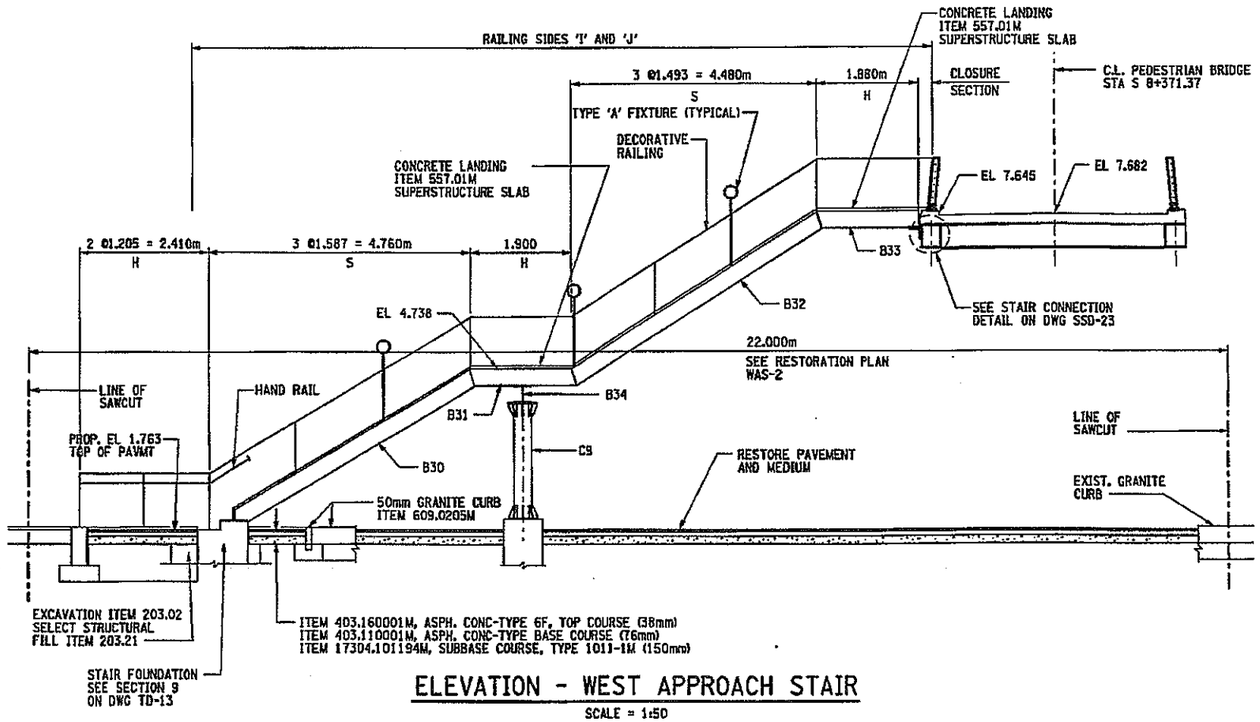


SIDE 'H'

DECORATIVE RAILING DEVELOPED ELEVATIONS

FOR LEGEND AND ADDITIONAL NOTES SEE SHEETS R-3 AND R-4

VERTICAL LINES DEPICTED ON RAILING ELEVATIONS REPRESENT CENTERLINE BETWEEN ADJACENT POST BASE PLATES. LENGTHS OF RAILING ARE MEASURED ALONG THE TOP OF CURB AT CENTERLINE OF BASE PLATES. CONTRACTOR SHALL FABRICATE SECTIONS OF RAILING WITH MAXIMUM NUMBER OF PANELS.



ELEVATION - WEST APPROACH STAIR

SCALE = 1:50

NOTES:

1. STRUCTURAL SUPPORT COLUMN AND FRAME, INCLUDING WELDING, BOLTS, WASHERS, NUTS, ANCHORAGE, BASE PLATES, CAP PLATES, SHIMS AND STAIR STINGERS SHALL BE PAID FOR UNDER ITEM 564.0501M
2. FOR FRAMING MEMBER SIZES AND DETAILS SEE DWG TD-7 AND TD-13
3. DECORATIVE RAILING SHALL BE PAID FOR UNDER ITEM 11615.8099M.
4. SECTIONS 13 AND 21 ARE SHOWN ON DWG TD-12 AND TD-13
5. FOR DECORATIVE RAILING DETAILS, SEE DWGS R-3 AND TD-13
6. SEE DWG R-4 FOR DEVELOPED ELEVATION OF EAST TOUCH DOWN
7. SEE DWG TD-13 FOR SECTION 9-9
8. FOR RAILING ELEVATIONS ON EAST TOUCHDOWN, SEE DWG R-4

AS-BUILT REVISIONS

SIGNATURE DATE

WEST APPROACH, STAIR PLANS AND ELEVATIONS

BARBARA THAYER, P.C.
350 WEST 42ND STREET NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
WAS-1	DEC. 2000	AS SHOWN

EARTH TECH

JV, FS — CHECKED BY:
EL, RM, JV — DRAFTED BY:
JV — CHECKED BY:
GF, AS — DESIGNED BY:
FS — ESTIMATED BY:
BT — IN CHARGE OF:

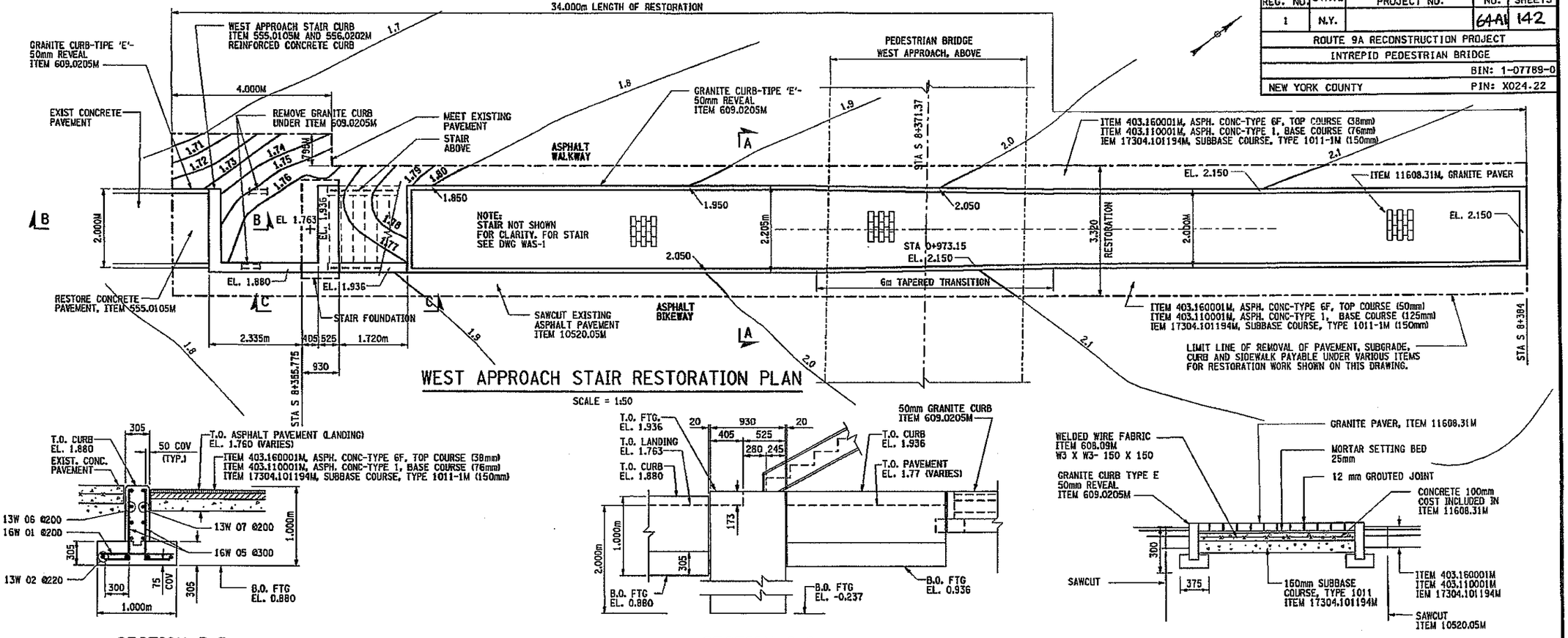
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		64-A1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22



WEST APPROACH STAIR RESTORATION PLAN

SCALE = 1:50

SECTION B-B

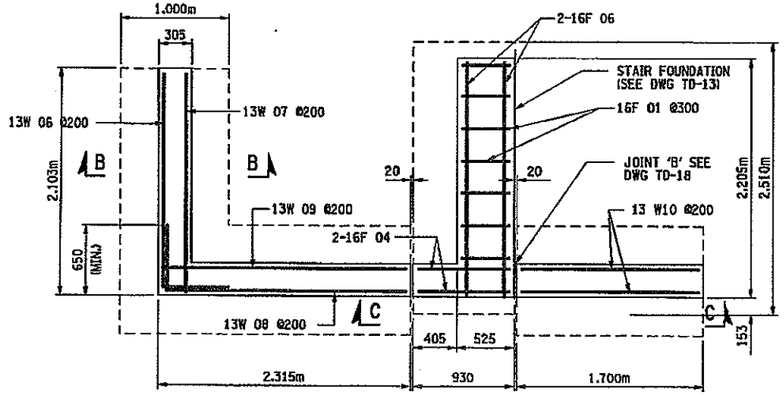
SCALE = 1:25

SECTION C-C

SCALE = 1:25

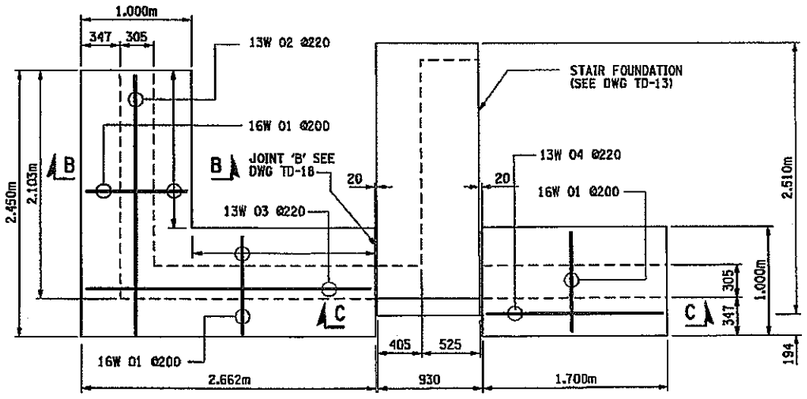
SECTION A-A

SCALE = 1:25



WEST APPROACH STAIR CURB PLAN

SCALE = 1:25



WEST APPROACH STAIR CURB FOOTING PLAN

SCALE = 1:25

NOTES:

1. SITE DATA SHOWN IS BASED ON SEGMENT 7 CONTRACT DOCUMENTS
2. GRANITE PAVER, ITEM 11608.31M, COLOR CARNELIAN, SIZE 600mm X 600mm, TO MATCH PAVERS AT EXISTING ADJACENT STEPOUT.

AS-BUILT REVISIONS

SIGNATURE — DATE

WEST APPROACH STAIR RESTORATION PLAN AND DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
WAS-2	DEC. 2000	AS SHOWN

BARBARA THAYER, P.C.
220 WEST 42ND STREET NEW YORK, NEW YORK

EARTH TECH

DESIGNED BY: GF, AS — DRAFTED BY: EL, RM, JV — CHECKED BY: JV — ESTIMATED BY: FS — CHECKED BY: JV, FS — IN CHARGE OF: BT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	65	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

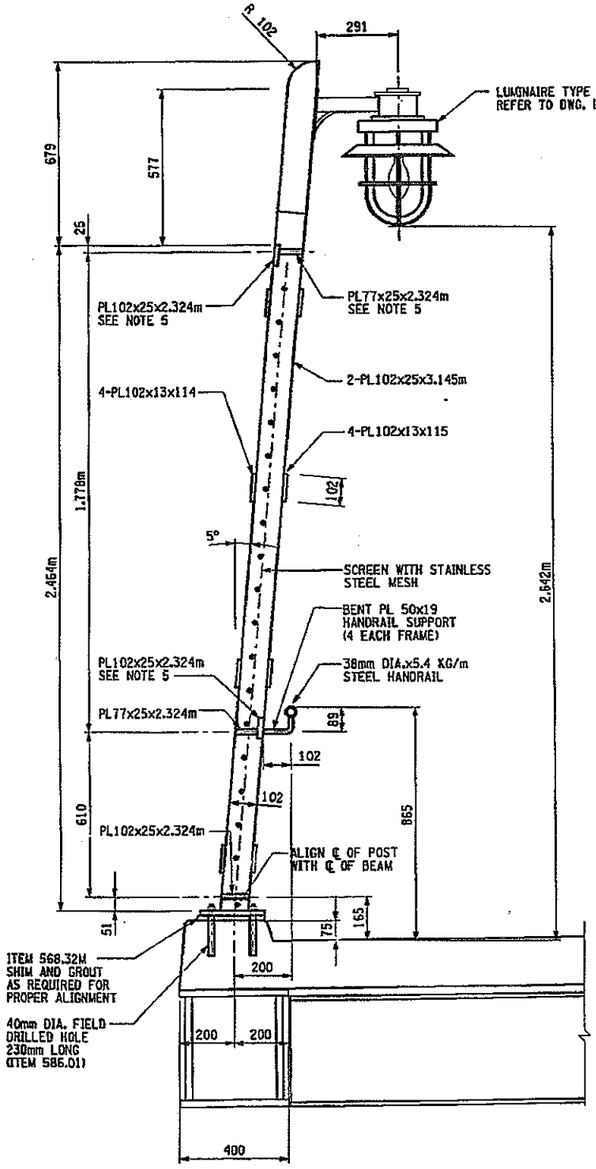
NEW YORK COUNTY PIN: X024.22

DESIGNED BY: CF, AS CHECKED BY: JV

DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS

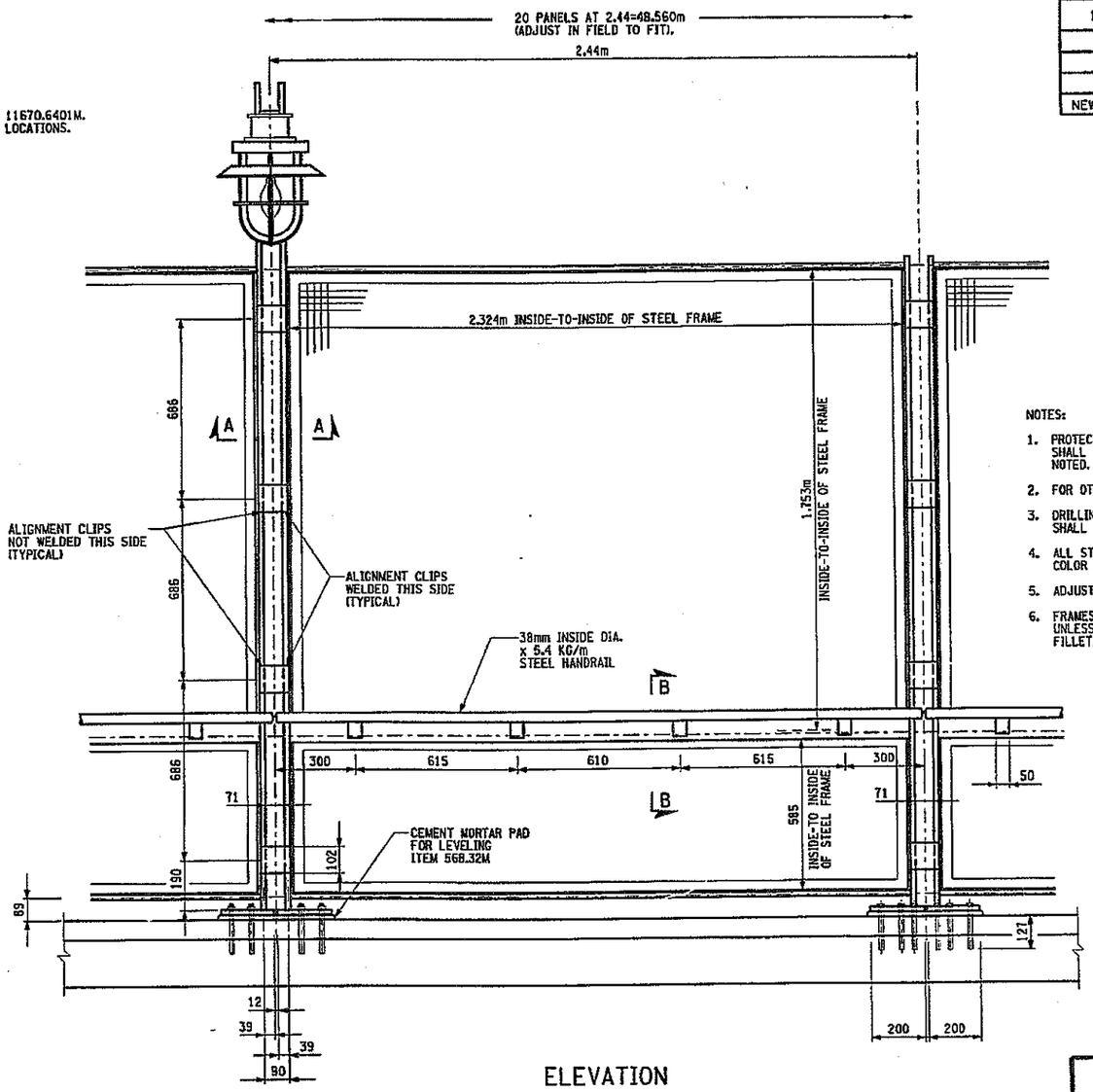
ESTIMATED BY: FS CHECKED BY: JV, FS

IN CHARGE OF: BT



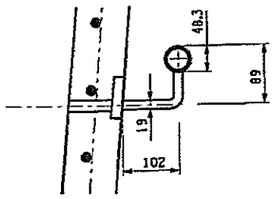
SECTION AT SCREENING

SCALE 1:10



ELEVATION

SCALE 1:10



SECTION B-B

SCALE 1:5

NOTES:

1. PROTECTIVE SCREENING WORK SHOWN ON THIS DRAWING SHALL BE PAID UNDER ITEM 11607.9902M UNLESS OTHERWISE NOTED.
2. FOR OTHER DETAILS AND SECTIONS, SEE DWG. R-2.
3. DRILLING AND GROUTING ANCHOR BOLTS IN CONCRETE SHALL BE PAID FOR UNDER ITEM 586.01.
4. ALL STEEL FRAMING SHALL BE PAINTED FEDERAL STANDARD COLOR 25240 PAYABLE UNDER ITEM 11607.9902M.
5. ADJUST EXACT LENGTH TO FIT.
6. FRAMES AND HANDRAIL SECTIONS TO BE ALL WELDED CONSTRUCTION UNLESS OTHERWISE NOTED. ALL WELDS TO BE CONTINUOUS 8 mm FILLET, U.O.N.

AS-BUILT REVISIONS

SIGNATURE DATE

PROTECTIVE SCREENING
DETAILS 1

BARBARA THAYER, P.C.
560 WEST 43RD STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
R-1	DEC. 2000	AS SHOWN	

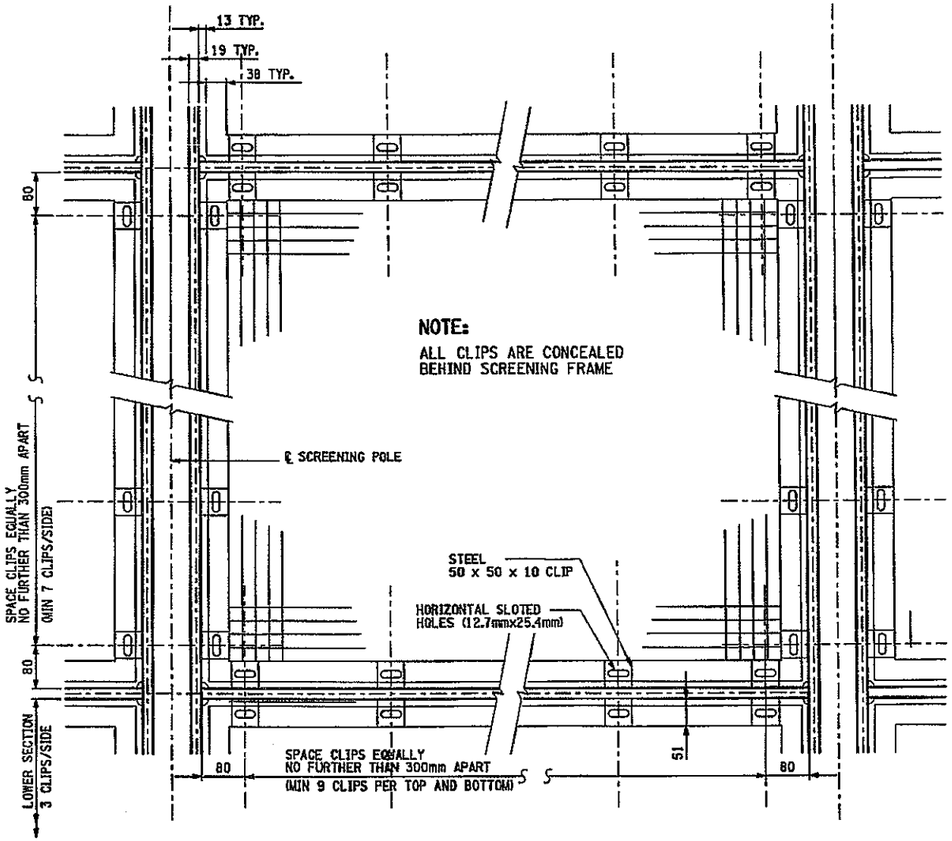
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	66	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

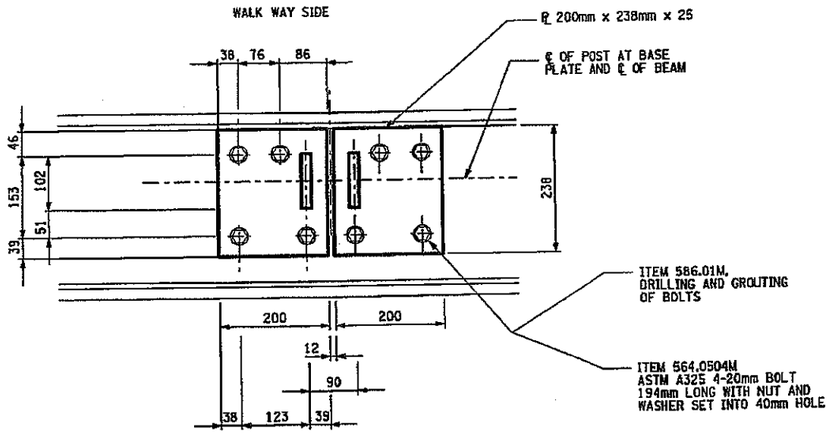
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22



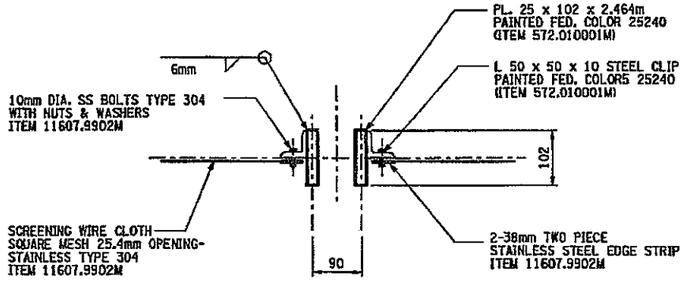
PARTIAL ELEVATION - SCREENING ATTACHMENT

SCALE 1:5



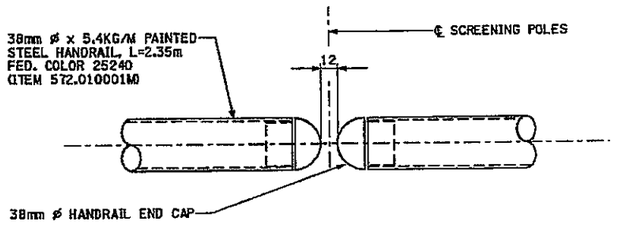
BRIDGE SCREENING & BASE PLATE DETAIL

SCALE 1:5



SECTION A-A

SCALE 1:5



DETAIL OF HANDRAIL END CAP

SCALE 1:2

NOTES:

1. ALL ITEMS SHOWN FOR BRIDGE SCREENING SHALL BE PAID UNDER ITEM - 11607.9902M UNLESS OTHERWISE NOTED.
2. DRILLING AND GROUTING ANCHOR BOLTS IN CONCRETE SHALL BE PAID FOR UNDER ITEM 586.01M.
3. CEMENT MORTAR PADS PAYABLE UNDER ITEM 568.32N.
4. FOR ADDITIONAL NOTES, SEE DWG. R-1.

AS-BUILT REVISIONS

SIGNATURE DATE

PROTECTIVE SCREENING DETAILS 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
R-2	DEC. 2000	AS SHOWN

BARBARA THAYER, P.C.
260 WEST 42ND STREET NEW YORK, NEW YORK

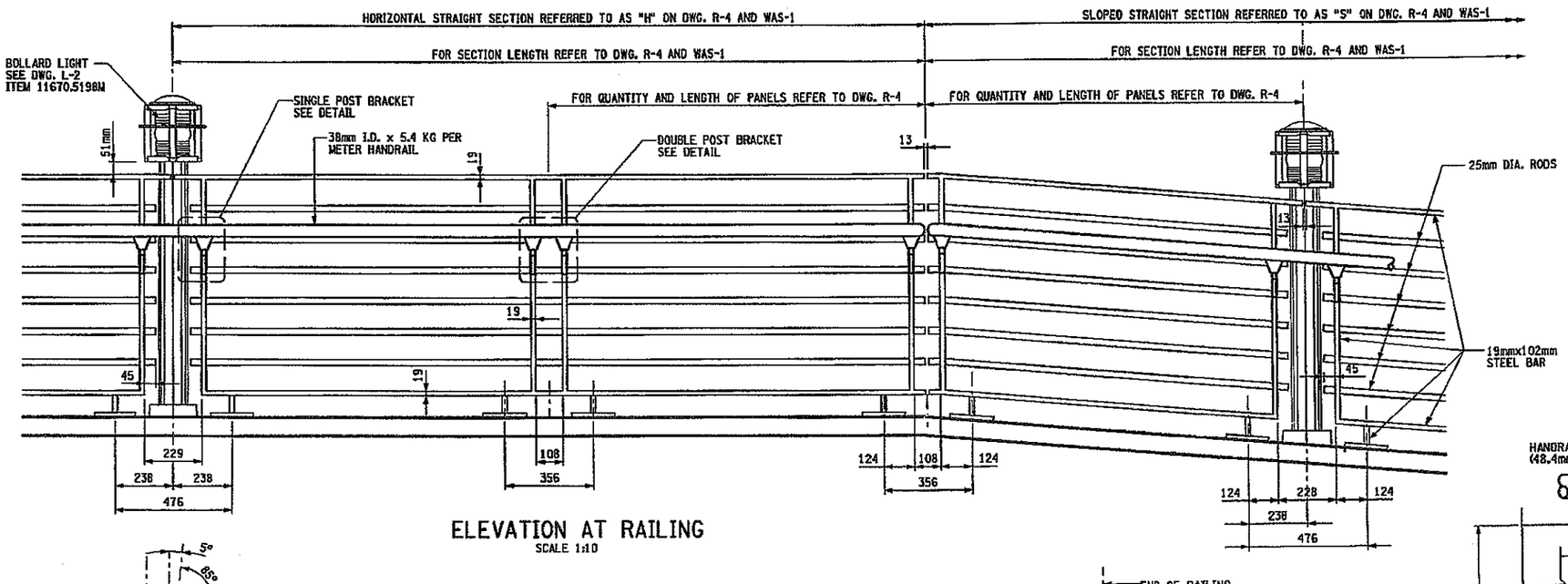
EARTH TECH

DESIGNED BY: GF, AS — CHECKED BY: JV, FS — DRAFTED BY: EL, RM, JV — CHECKED BY: JV — ESTIMATED BY: FS — IN CHARGE OF: BT

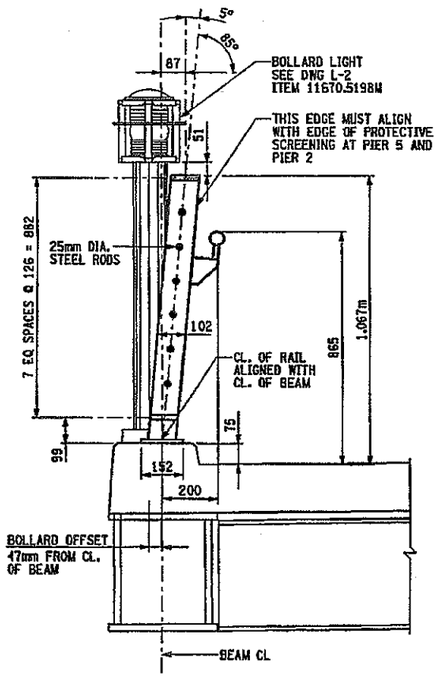
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	67	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

NOTES:

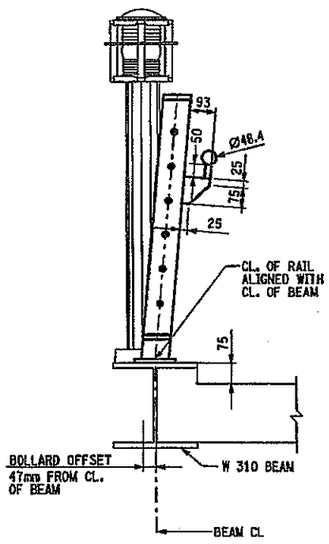
1. ALL RAILING WORK SHOWN ON THIS SHEET SHALL BE PAID UNDER ITEM 11615.8099M, INCLUDING ANCHORAGE ON STEEL AND HANDRAIL, UNLESS OTHERWISE NOTED
2. RAILING, HANDRAIL AND BASE SHALL BE PAINTED FEDERAL STANDARD COLOR 25240 INCLUDED IN ITEM 11615.8099M
3. ALL MEMBERS SHALL BE JOINED USING CONTINUOUS 8mm FILLET WELDS, GROUND SMOOTH, U.O.N.
4. ALL BARS AND PLATES TO BE SOLID, ASTM A36 GRADE STEEL.
5. ROUND ALL SQUARE EDGES AND BURRS BY GRINDING OR FILING SMOOTH.
6. FRAMES AND HANDRAILS TO BE ALL WELDED CONSTRUCTION UNLESS OTHERWISE NOTED. ALL WELDS TO BE CONTINUOUS 8mm FILLET, U.O.N.
7. ALL CORNERS ARE TO BE 45° MITERED



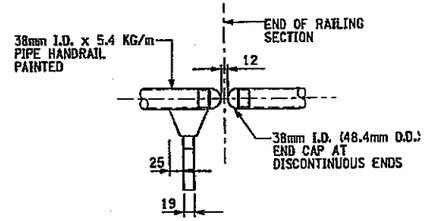
ELEVATION AT RAILING
SCALE 1:10



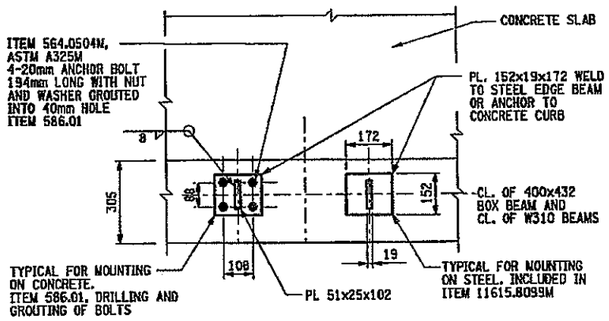
SECTION THRU CONCRETE CURB
SCALE 1:10



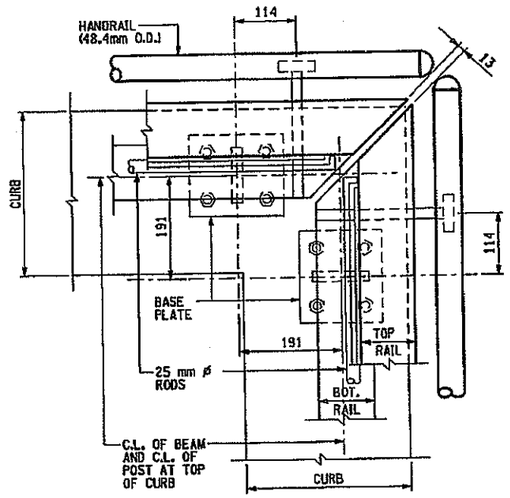
SECTION THRU STEEL FLANGE CURB
SCALE 1:10



SINGLE POST
HANDRAIL BRACKET DETAIL
SCALE 1:5



TYPICAL BASE CONNECTION PLAN
SCALE 1:10



PLAN
EXTERNAL CORNER
(INTERNAL CORNER SIMILAR)
SCALE 1:5

AS-BUILT REVISIONS

SIGNATURE DATE

DECORATIVE RAILING DETAILS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
R-3	DEC. 2000	AS SHOWN

BARBARA THAYER, P.C.
880 WEST 42ND STREET
NEW YORK, NEW YORK

EARTH TECH

IN CHARGE OF: BT
DESIGNED BY: GF, AS
CHECKED BY: JV
DRAFTED BY: EL, RM, JV
CHECKED BY: JV, FS
ESTIMATED BY: FS
CHECKED BY: JV, FS

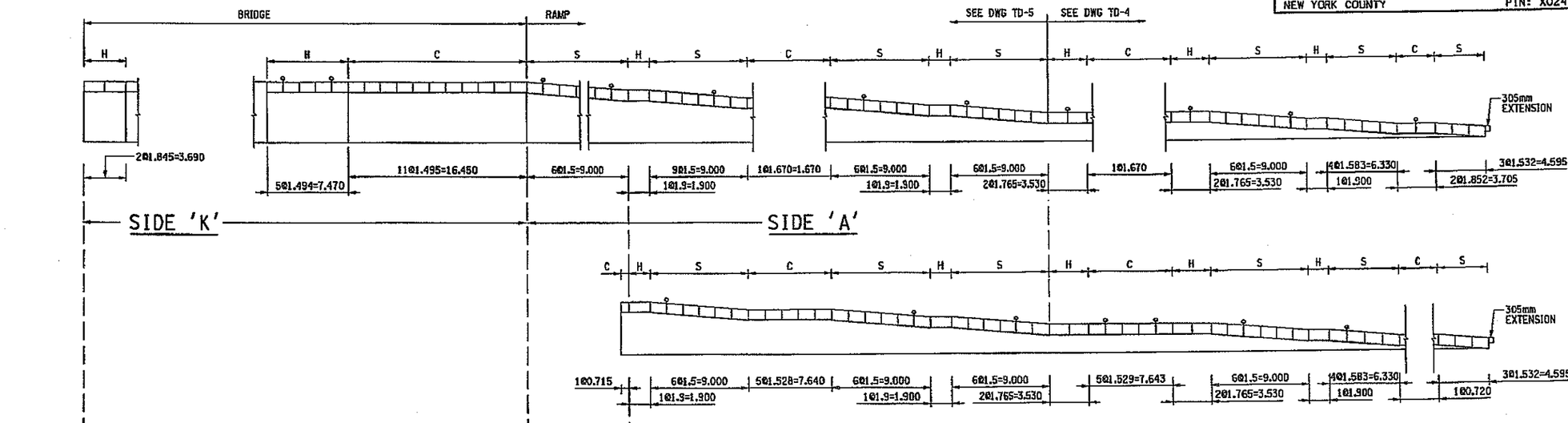
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	68	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22



LEGEND:

S = SLOPED, STRAIGHT SECTION
C = HORIZONTAL, CURVED SECTION
H = HORIZONTAL, STRAIGHT SECTION

† = BOLLARD LIGHT

NOTES:

1. FOR RAILINGS LOCATIONS SEE DRAWINGS TD-4, TD-5 AND WAS-1
2. SEE DRAWING WAS-1 FOR DEVELOPED ELEVATIONS FOR WEST APPROACH
3. VERTICAL LINES DEPICTED ON RAILING ELEVATIONS REPRESENT CENTERLINE BETWEEN ADJACENT POST BASE PLATES. LENGTHS OF RAILING ARE MEASURED ALONG THE TOP OF CURB AT CENTERLINE OF BASE PLATES. CONTRACTOR SHALL FABRICATE SECTIONS OF RAILING WITH MAXIMUM NUMBER OF PANELS.

AS-BUILT REVISIONS

SIGNATURE — DATE

DECORATIVE RAILING DEVELOPED ELEVATIONS - EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
R-4	DEC. 2000	1:200

BARBARA THAYER, P.C.
220 WEST 42ND STREET
NEW YORK, NEW YORK

EARTH TECH

DESIGNED BY: GF, AS
DRAFTED BY: EL, RM, IV
ESTIMATED BY: FS
CHECKED BY: JV
CHECKED BY: JV, FS
CHECKED BY: JV, FS
IN CHARGE OF: BT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	69	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

DESIGNED BY: GF, AS CHECKED BY: JV, FS

DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS

ESTIMATED BY: FS CHECKED BY: JV, FS

IN CHARGE OF: BT

PHYSICAL BULKHEAD

PIER 86

PROPOSED INTREPID MUSEUM VISITOR'S CENTER

W 46 STREET

PLANTED MEDIAN

0+950 0+970 0+990 1+010

ASPHALT WALKWAY

ASPHALT BIKEWAY

GRANITE PAVER STRIPOUT

WEST STAIR

ROUTE 9A SOUTHBOUND

ROUTE 9A NORTHBOUND

TYPE D

UPPER LEVEL LIGHTING PLAN

GROUND LEVEL LIGHTING PLAN

TYPE	DESCRIPTION	LAMP	QUANTITY	SPEC. ITEM
A	BOLLARD TYPE WITH JELLY JAR FIXTURE	100 W METAL HALIDE	31	11670.5198M
B	DECORATIVE FIXTURE MOUNTED ON SCREEN POST	50 W METAL HALIDE	10	11670.6401M
B'	DECORATIVE FIXTUE STEM MOUNTED		1	11670.6401M
C DOWN C' (UP)	COLUMN MOUNTED CYLINDER	770, 70W METAL HALIDE	8	11670.5146M
D	POLE MOUNTED LUMINAIRES	175 W METAL HALIDE	1	11670.1501M
E	SURFACE MOUNTED VANDAL RESISTANT	4 BIAXIAL 40 W	2	11670.5145M

NOTES:

1. FOR FIXTURE TYPE A REFER TO DWG NO. L-2
2. FOR FIXTURE TYPE B AND B' REFER TO DWG NO. L-3
3. FOR FIXTURE TYPE C AND C' REFER TO DWG NO. L-4
4. FOR FIXTURE TYPE D REFER TO DWG NO. L-5

AS-BUILT REVISIONS

SIGNATURE DATE

LIGHTING PLAN - BRIDGE AND EAST TOUCHDOWN

BARBARA THAYER, P.C.
800 WEST 42ND STREET
NEW YORK, NEW YORK

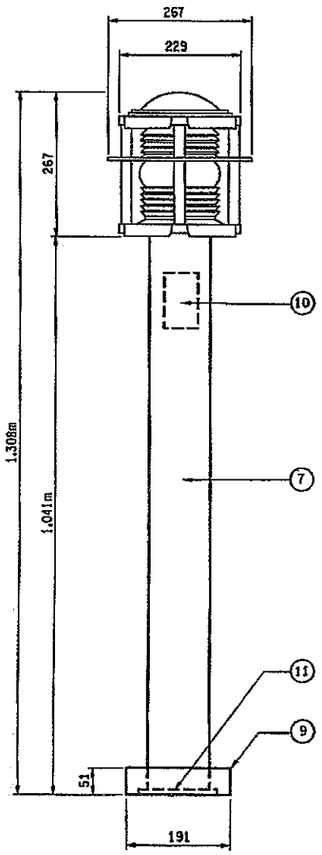
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
L-1	DEC. 2000	1:200	EARTH TECH

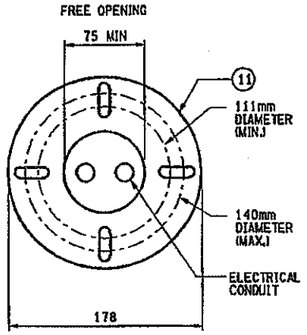
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	70	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY
PIN: X024.22

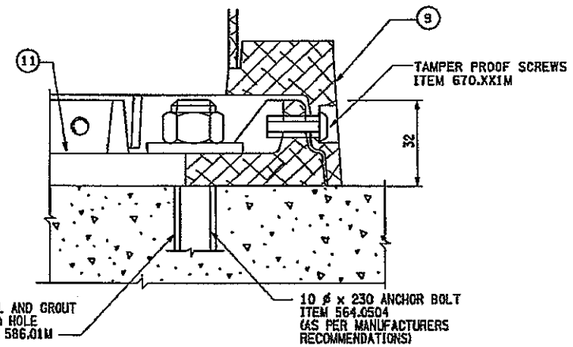
DESIGNED BY: GF, AS CHECKED BY: JV DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS
ESTIMATED BY: FS CHECKED BY: JV, FS IN CHARGE OF: BT



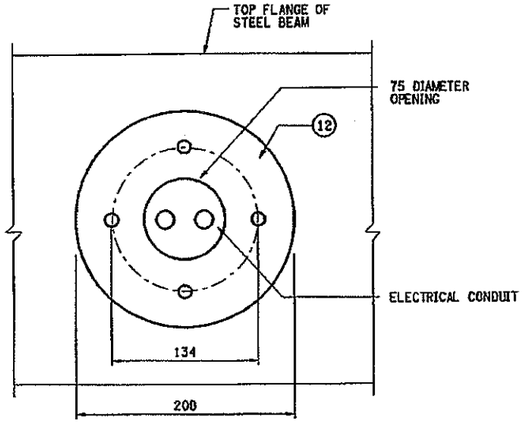
ELEVATION
SCALE 1 : 5



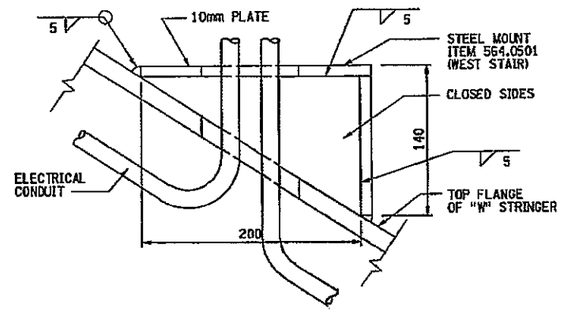
MANUFACTURERS ANCHOR PLATE
SCALE 1 : 2.5
NOTE: ANCHOR PLATE SHOP WELDED TO BOLLARD



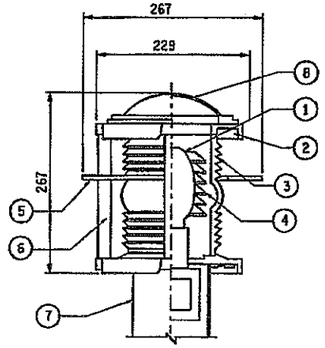
MOUNTING DETAIL*1 FOR FLAT CONCRETE SURFACES
SCALE 1 : 1



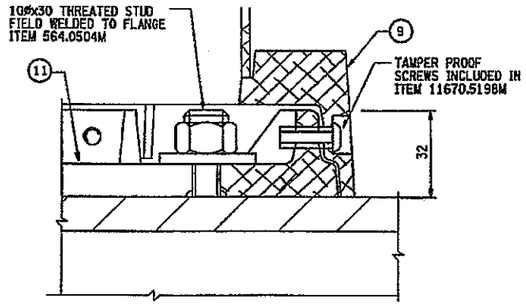
BASE PLATE ASSEMBLY DETAIL
ITEM 564.0501M
SCALE 1 : 2.5



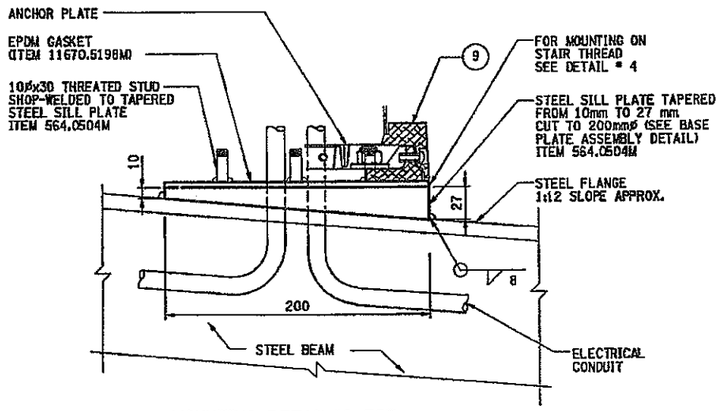
MOUNTING DETAIL*4 FOR MOUNTING ON SLOPED STAIR THREAD
NOT TO SCALE



ELEVATION
NOT TO SCALE



MOUNTING DETAIL*3 FOR FLAT STEEL SURFACES
SCALE 1 : 1



MOUNTING DETAIL*2 FOR SLOPED STEEL SURFACES
NOT TO SCALE

LUMINAIRE

COMPONENT	DESCRIPTION	ITEM
1	LAMP - 100W METAL HALIDE	11670.5198M
2	MECHANICALLY FASTENED CAST ALUMINUM UPPER HOUSING	11670.5198M
3	FRESNEL-TYPE BOROSILICATE LENS	11670.5198M
4	HOUSE SIDE SHIELD (INSTALL ROADWAY SIDE)	11670.5198M
5	CAST-ALUMINUM DISK, 6mm THICK	11670.5198M
6	GUARD: MECHANICALLY FASTENED ALUMINUM RODS 21mm O.D.	11670.5198M
7	BOLLARD: EXTRUDED ALUMINUM POLE, OUTSIDE DIA. 114 mm AND WALL THICKNESS 3mm.	11670.5198M
8	MECHANICALLY FASTENED CAST ALUMINUM DOME	11670.5198M
9	CAST-ALUMINUM BASE COVER. MECHANICALLY FASTENED.	11670.5198M
10	BALLAST -34C° LAMP-STARTING CAPACITY, POWER FACTOR 90% MIN.	11670.5198M
11	CAST-ALUMINUM BASE PLATE, 19mm THICK	11670.5198M
12	TAPERED SILL PLATE - FOR SLOPED STEEL SURFACES	564.0504M

NOTE:

1. BOLLARD AND BALLAST SHALL BE UL APPROVED.
2. ALL ALUMINUM SHALL BE A POLYESTER POWDER COAT PAINT FINISH, ELECTROSTATICALLY APPLIED. COLOR SHALL BE FEDERAL STANDARD COLOR 25240
3. ALL WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 11670.5198M, U.O.N.

AS-BUILT REVISIONS

SIGNATURE DATE

LIGHTING FIXTURE DETAILS
FIXTURE TYPE A

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
666 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE
L-2	DEC. 2000	AS SHOWN

EARTH TECH

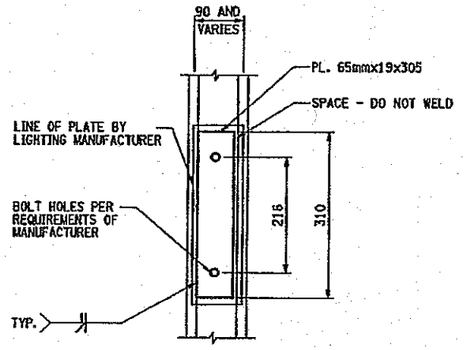
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	71	142

ROUTE 9A RECONSTRUCTION PROJECT

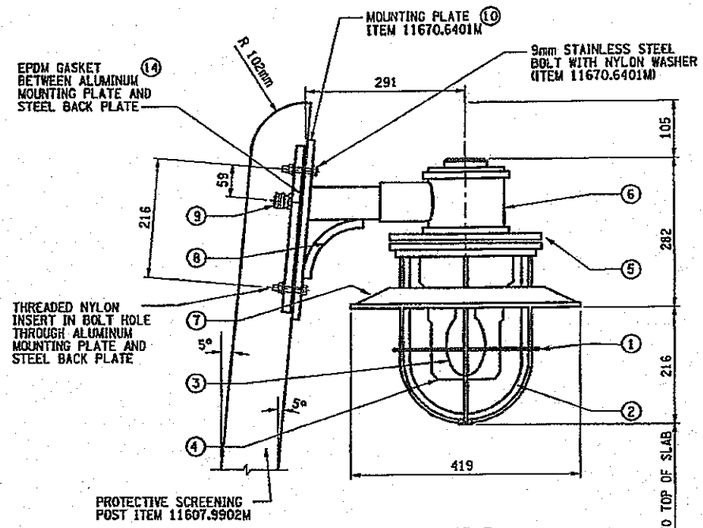
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



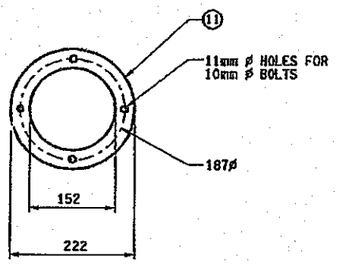
ELEVATION AT BACK PLATE
ITEM 11607.6401
SCALE: 1:5



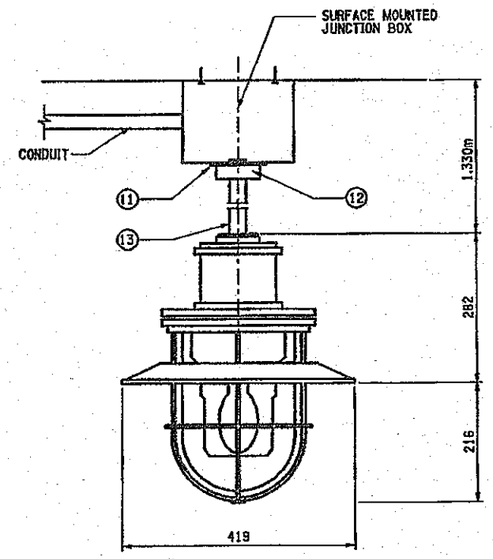
TYPE B
BRACKET ON PROTECTIVE SCREEN
SCALE: 1:5

BRACKET/LUMINAIRE

COMPONENT	DESCRIPTION	ITEM
1	DECORATIVE GUARD: 10mm O.D. ALUMINUM RODS. ATTACHED TO THE LOCKING SYSTEN.	11670.6401M
2	GLOBE: POLYCARBONATE. WITH INTERIOR ETCHED FINISH.	11670.6401M
3	LAMP: 50 WATT. METAL HALIDE.	11670.6401M
4	REFLECTOR: SPUN ALUMINUM. MECHANICALLY SECURED.	11670.6401M
5	LOCKING SYSTEN: CAST ALUMINUM. QUARTER TURN SYSTEM WITH 3 INDEPENDENT PRESSURE POINTS. FOR ANCHORAGE.	11670.6401M
6	BALLAST: HIGH POWER FACTOR OF 90%. -30nC LAMP STARTING CAPACITY. PRIMARY VOLTAGE 277 VOLT. WITH DISCONNECT PLUG.	11670.6401M
7	HOUSING: CAST ALUMINUM. MECHANICALLY ATTACHED.	11670.6401M
8	DECORATIVE ROD: BENT ALUMINUM. 16mm O.D., WELDED TO THE ARM.	11670.6401M
9	CONNECTOR: WATERTIGHT CONNECTOR TO ACCEPT A CABLE HAVING A DIAMETER OF 7.8mm - 14.2mm.	11670.6401M
10	CAST ALUMINUM MOUNTING PLATE - 13mm THICK 90mm WIDE BY 330mm LONG	11670.6401M
11	CAST ALUMINUM MOUNTING PLATE 13mm THICK WELDED TO CYLINDER	11670.6401M
12	ALUMINUM CYLINDER WELDED TO STEN	11670.6401M
13	EXTRUDED ALUMINUM STEM 60mm DIAMETER. WELDED TO CYLINDER	11670.6401M
14	EPDN GASKET	11670.6401M



CAST ALUMINUM
MOUNTING PLATE DETAIL
SCALE: 1:5



TYPE B'
PENDANT HUNG ITEM 11670.6401M
SCALE: 1:5

NOTES:

1. WIRING: PROVIDE WATERPROOF EXTENSION FROM LUMINAIRE TO THE WALL BRACKET
2. MEMORY RETENTIVE HOLLOW SILICONE GASKETING
3. ALL EXPOSED SCREWS STAINLESS STEEL.
4. ALL ALUMINUM SHALL HAVE A THERMOSETTING POLYESTER POWDER COAT. TEXTURED PAINT FINISH, ELECTROSTATICALLY APPLIED. COLOR SHALL BE FEDERAL STANDARD COLOR 25240

AS-BUILT REVISIONS

SIGNATURE DATE

LIGHTING FIXTURE DETAILS
FIXTURE TYPE B AND B'

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
L-3	DEC. 2000	AS SHOWN	

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JW, FS ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, JV CHECKED BY: JW, FS

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583 12		142

ROUTE 9A RECONSTRUCTION PROJECT

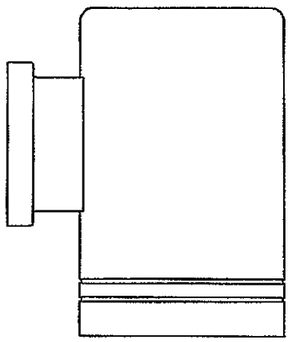
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY

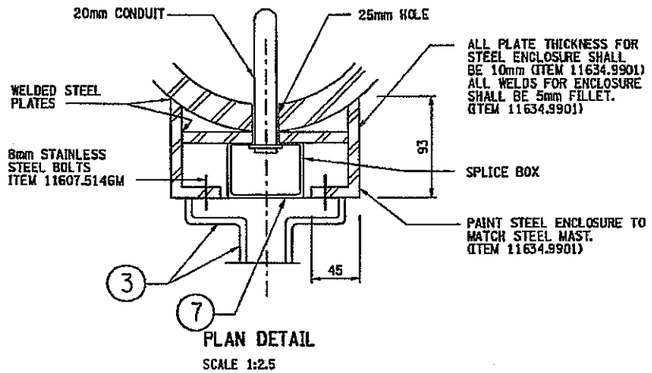
PIN: X024.22

DESIGNED BY: OF, AS CHECKED BY: JV
DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS
ESTIMATED BY: FS
IN CHARGE OF: BT



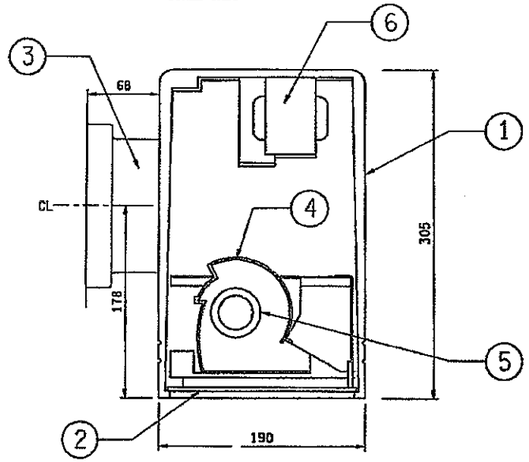
ELEVATION

SCALE 1:2.5



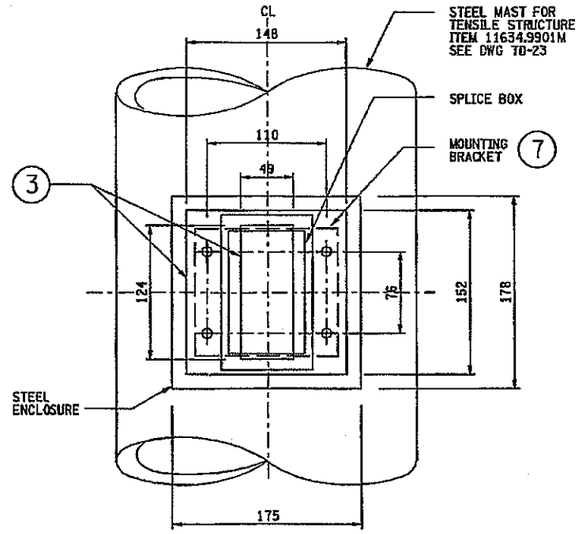
PLAN DETAIL

SCALE 1:2.5



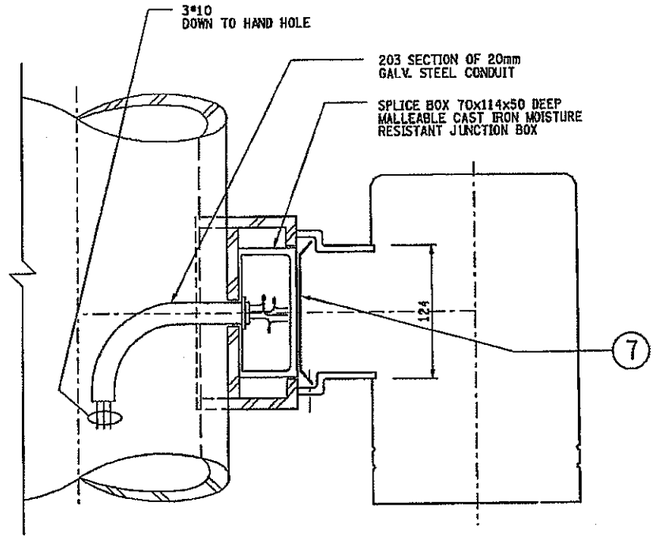
SECTION

SCALE 1:2.5



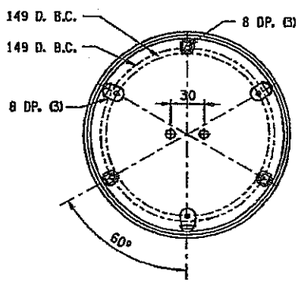
ELEVATION

SCALE 1:2.5



SECTION

SCALE 1:2.5



BRACKET/LUMINAIRE		
COMPONENT	DESCRIPTION	ITEM
1	HOUSING: SINGLE-PIECE DIE CAST ALUMINUM.	11670.5146M
2	LENS: CLEAR - TEMPERED 5mm THICK GLASS LENS.	11670.5146M
3	WALL BRACKET: CAST ALUMINUM CANOPY WITH INTEGRATED ALUMINUM ARM SECURED TO HOUSING WITH (4) 8mm BOLTS.	11670.5146M
4	REFLECTOR: SPECULAR EXTRUDED AND FACETED ALZAC ALUMINUM. ELECTRO POLISHED ANODIZED AND SEALED. FORWARD THROW OPTICS.	11670.5146M
5	LAMP 70W METAL HALIDE T-6 BASE.	11670.5146M
6	INTERNAL CORE AND COIL BALLAST DESIGNED FOR THE 70W METAL HALIDE LAMP.	11670.5146M
7	MOUNTING BRACKET. 2mm THICK GALVANIZED STEEL.	11670.5146M

NOTES:

1. WIRING: PROVIDE WATERPROOF EXTENSION FROM LUMINAIRE TO THE WALL BRACKET
2. PROVIDE GASKETING AT MOUNTING BRACKET
3. ALL EXPOSED HARDWARE STAINLESS STEEL.
4. ALL ALUMINUM SHALL HAVE A THERMOSETTING POLYESTER POWDER COAT, TEXTURED PAINT FINISH. ELECTROSTATICALLY APPLIED. COLOR SHALL BE FEDERAL STANDARD COLOR 36628 INCLUDED IN ITEM 11670.5146M
5. UPLIGHT (C') SIMILAR, MOUNTED WITH LIGHT SOURCE DIRECTED UP.
6. FOR MOUNTING HEIGHTS REFER TO DWG TD-23

AS-BUILT REVISIONS

SIGNATURE DATE

LIGHTING FIXTURE DETAILS FIXTURE TYPE C AND C'

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
660 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE	
L-4	DEC. 2000	AS SHOWN	EARTH TECH

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258373	73	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

DRAFTED BY: EL, RM, IV — CHECKED BY: JV, FS

DESIGNED BY: GF, AS — CHECKED BY: JV — ESTIMATED BY: FS

IN CHARGE OF: BT

LUMINAIRE

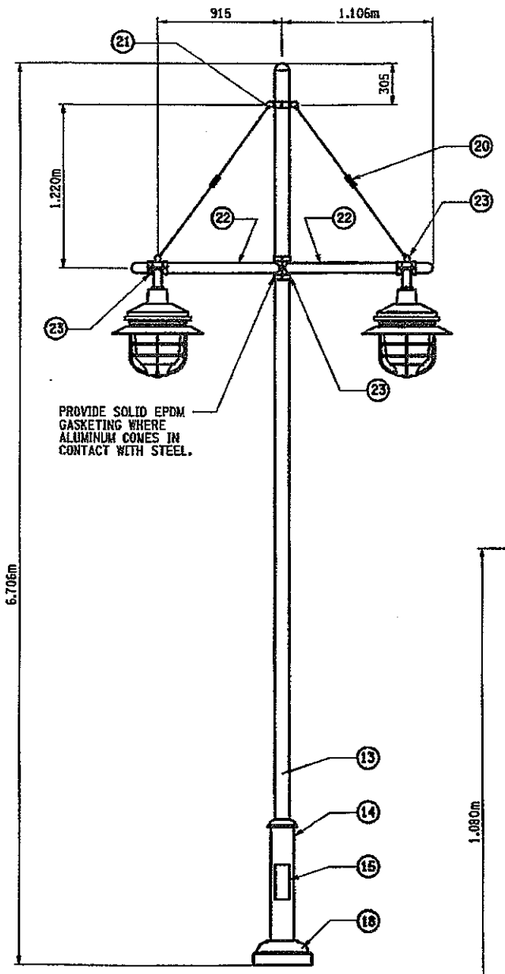
COMPONENT	DESCRIPTION	ITEM
1	DECORATIVE CLEAR GLASS LENS.	11670.1501M
2	CAST ALUMINUM COVER, REMOVABLE FOR RELAMPING	11670.1501M
3	CONSTANT PRESSURE QUARTER TURN LOCKING MECHANISM	11670.1501M
4	INJECTION MOULDED PRISMATIC ACRYLIC REFRACTOR. DISTRIBUTION PATTERN IES TYPE III	11670.1501M
5	LAMP 175 METAL HALIDE.	11670.1501M
6	MEDIUM BASE HEAT RESISTANT PULSE RATED SOCKET	11670.1501M
7	SPUN REFLECTOR WITH CAST ALUMINUM DECORATIVE STRUCTURE	11670.1501M
8	JUNCTION RING IN CAST ALUMINUM, BALLAST MOUNTING, OPENING ON INTEGRAL MOULDED HINGES AND LOCKING SCREW	11670.1501M
9	BALLAST AUTO-TRANSFORMER. CONSTANT WATTAGE HIGH POWER FACTOR	11670.1501M
10	CAST ALUMINUM TOP, HEAT DISSIPATING FINS	11670.1501M
11	ALUMINUM SUSPENDING TENON, ATTACHED TO MECHANICAL CLAMPING DEVICE	11670.1501M
12	INTERNAL PRISM REFRACTOR	11670.1501M

NOTE
1. ALL ALUMINUM SHALL HAVE POLYESTER POWDER COATING HIGH RESISTANCE FINISH. COLOR SHALL BE FEDERAL STANDARD COLOR 35183
2. HARDWARE: STAINLESS STEEL.

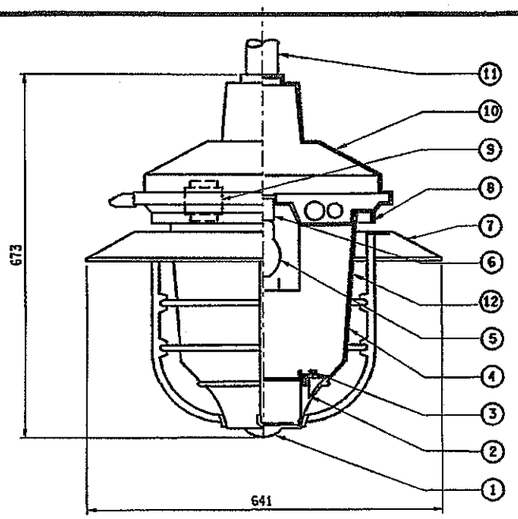
POLE/BASE

COMPONENT	DESCRIPTION	ITEM
13	SHAFT - STRAIGHT STEEL SHAFT, UPPER SECTION 127mm DIAMETER, 3.8mm THICK.	11670.1501M
14	CAST ALUMINUM JOINT COVER, MECHANICALLY FASTENED	11670.1501M
15	STEEL DOOR, 102mm BY 254mm OPENING, FULLY GASKETED PERIMETER, FOR WEATHERPROOFING. WITH SET SCREW ACCESS.	11670.1501M
16	STEEL BASE PLATE - 19mm THICK	11670.1501M
17	ANCHOR BOLTS, NUTS AND WASHERS, GALVANIZED STEEL.	564.0504M
18	TWO PIECE DECORATIVE STEEL BASE-COVER MECHANICALLY FASTENED.	11670.1501M
19	STEEL MUFFLER 168mm DIAMETER, 5mm WALL THICKNESS	11670.1501M
20	CABLE AND TURNBUCKLE. TYPE 316 STAINLESS STEEL.	11670.1501M
21	BOLTED CAST ALUMINUM COLLAR CLAMP.	11670.1501M
22	STRAIGHT EXTRUDED ALUMINUM ARM. 75mm DIAMETER	11670.1501M
23	CAST ALUMINUM CLAMP.	11670.1501M

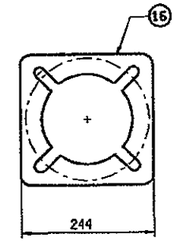
NOTE
1. POLYESTER POWDER COATING, POLE AND BASE TEXTURED FINISH. COLOR SHALL BE FEDERAL STANDARD 25240
2. HARDWARE: STAINLESS STEEL.
3. ALL STEEL COMPONENTS FOR POLE AND BASE SHALL CONFORM TO ASTM A500
4. ALL ALUMINUM COMPONENTS FOR LIGHT FIXTURE SHALL MEET THE REQUIREMENTS OF ASTM B-221
5. PROVIDE THREADED EXPANDABLE STAINLESS STEEL INSERTS AT ALL MECHANICALLY SECURED JOINTS OF STAINLESS STEEL CABLE
6. STAINLESS STEEL CABLE SHALL MEET REQUIREMENTS OF CSA-64 STANDARD



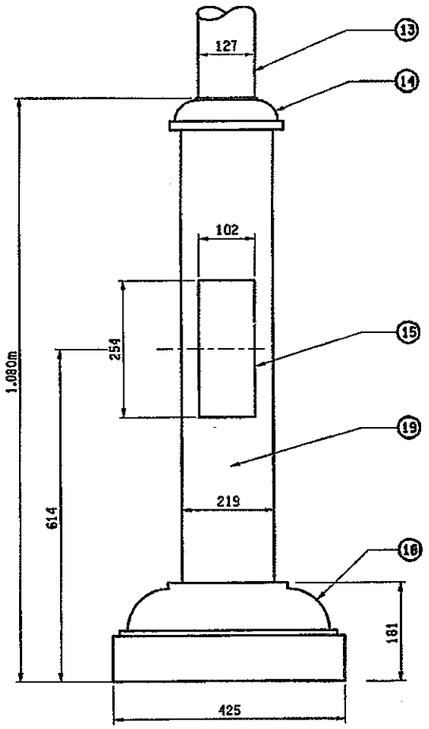
ELEVATION
SCALE 1:20



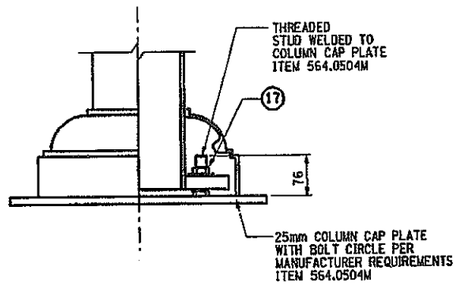
ELEVATION/SECTION
SCALE 1:5



PLAN DETAIL AT ANCHOR PLATE
SCALE 1:5



ELEVATION POLE BASE
SCALE 1:5



ELEVATION/SECTION AT POLE BASE
SCALE 1:5

AS-BUILT REVISIONS

SIGNATURE — DATE

LIGHTING FIXTURE DETAILS
FIXTURE TYPE D

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
800 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE	EARTH TECH
L-5	DEC. 2000	AS SHOWN	

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	74	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

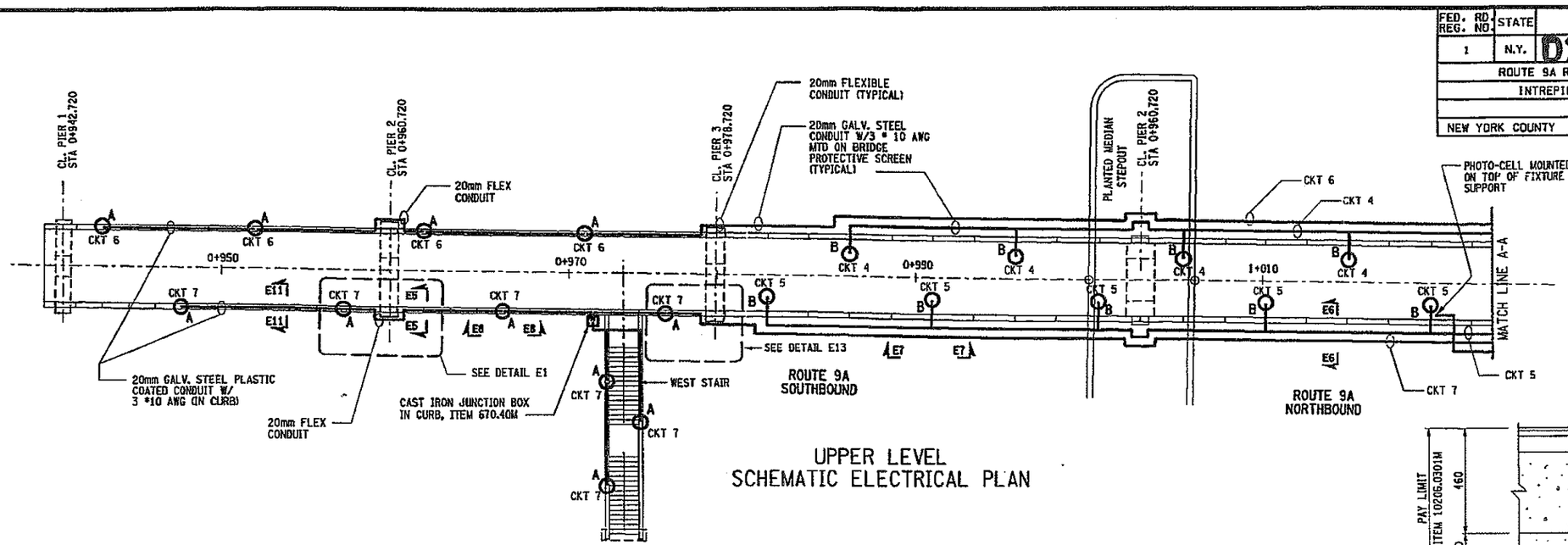
NEW YORK COUNTY PIN: X024.22

DESIGNED BY: GF, AS CHECKED BY: JV

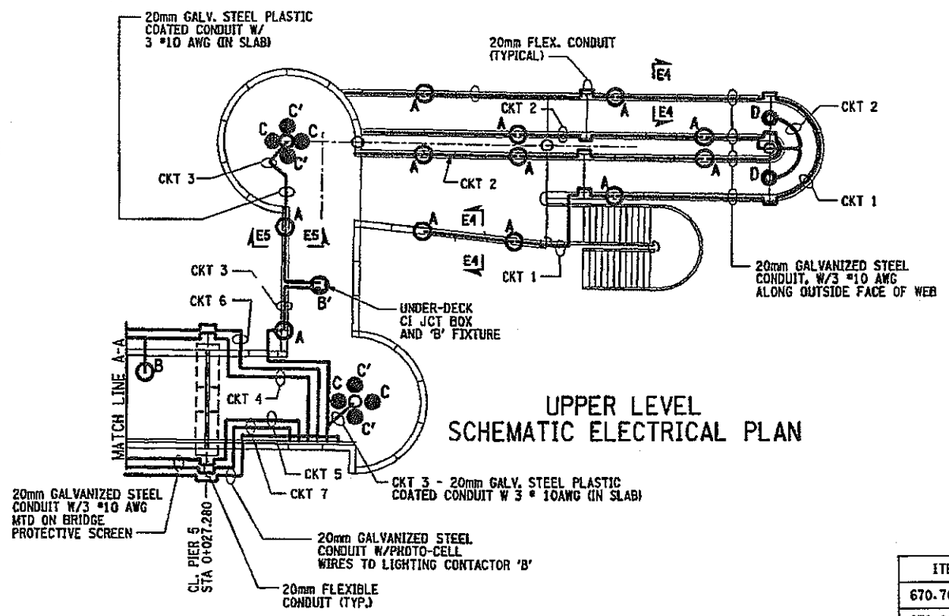
ESTIMATED BY: FS CHECKED BY: JV, FS

DRAFTED BY: EL, RM, JV CHECKED BY: JV

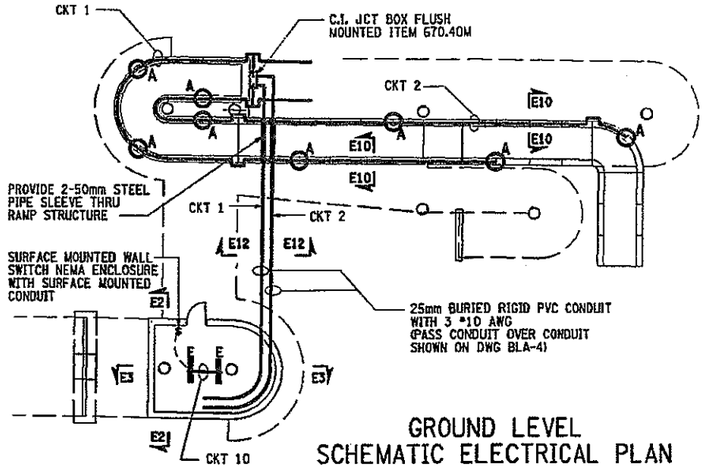
IN CHARGE OF: BT



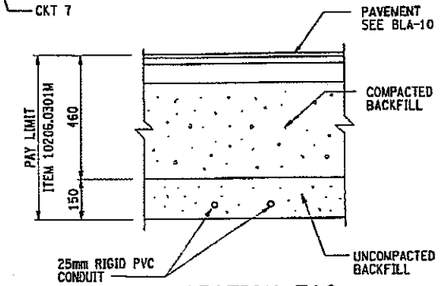
UPPER LEVEL SCHEMATIC ELECTRICAL PLAN



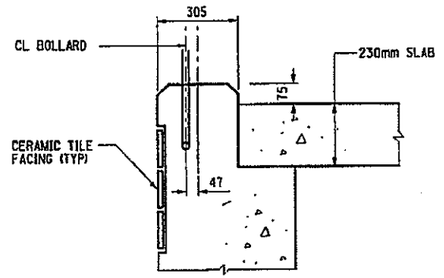
UPPER LEVEL SCHEMATIC ELECTRICAL PLAN



GROUND LEVEL SCHEMATIC ELECTRICAL PLAN



SECTION E12



SECTION E10

ITEM	DESCRIPTION	UNIT	QUANTITY
670.7006M	SINGLE CONDUCTOR CABLE #10	M	2200
670.60M	PHOTOELECTRIC CONTROL	EA	1
670.40M	CAST IRON JUNCT BOXES	EA	6
670.2601M	25mm RIGID PLASTIC CONDUIT	M	52
670.2501M	20mm FLEXIBLE CONDUIT	M	46
670.2301M	20mm GALV. STEEL PLASTIC COATED CONDUIT	M	125
670.2001M	20mm GALV. STEEL CONDUIT	M	495

AS-BUILT REVISIONS

SIGNATURE DATE

ELECTRICAL DETAILS 1

BARBARA THAYER, P.C.
660 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
L-6	DEC. 2000	N.T.S.	EARTH TECH

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	75	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

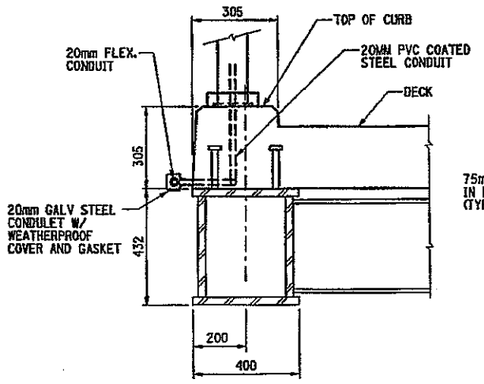
NEW YORK COUNTY PIN: X024.22

DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS

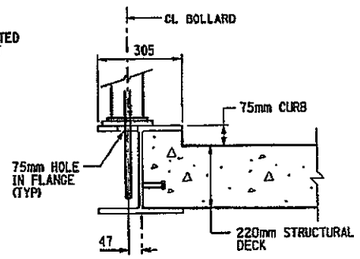
ESTIMATED BY: FS CHECKED BY: JV

DESIGNED BY: GF, AS CHECKED BY: JV, FS

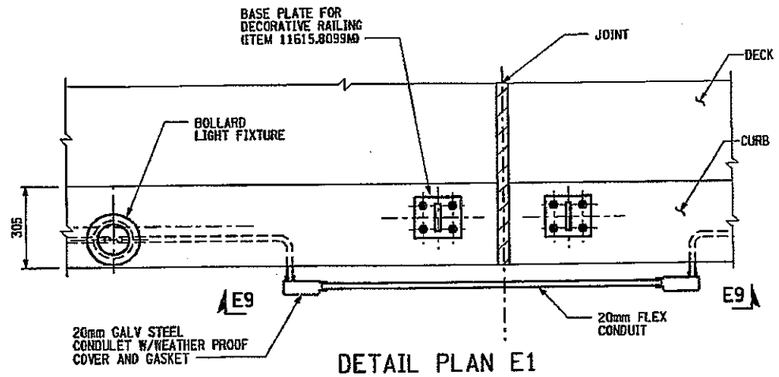
IN CHARGE OF: BT



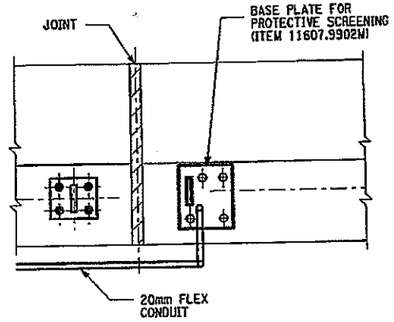
SECTION E5 - E5



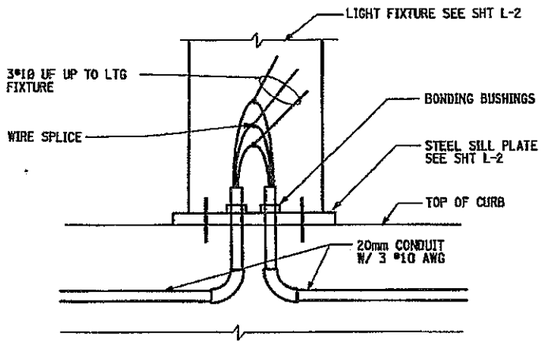
SECTION E4 - E4



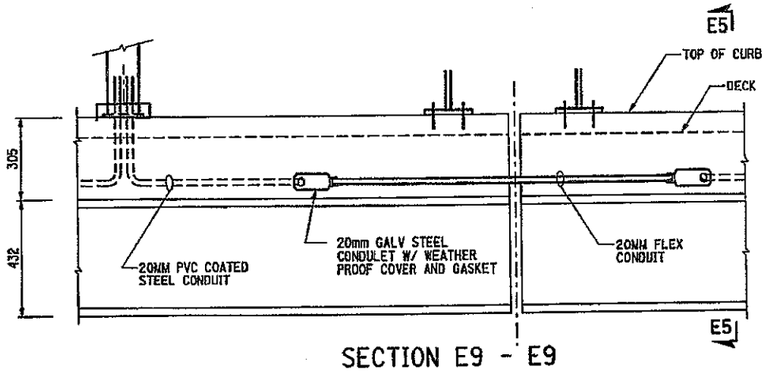
DETAIL PLAN E1



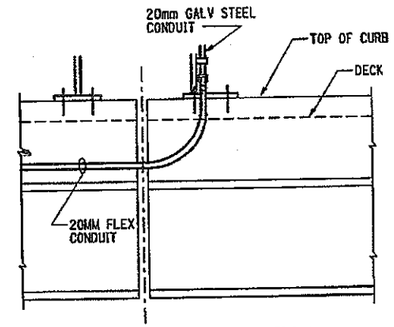
DETAIL PLAN E13



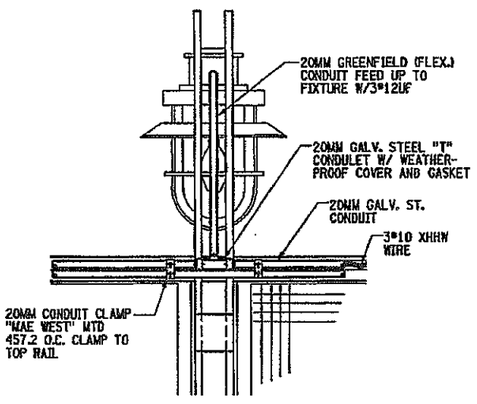
SECTION E8 - E8



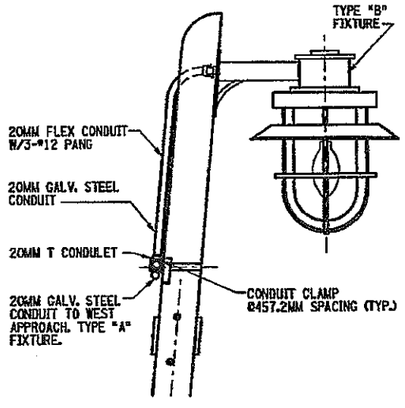
SECTION E9 - E9



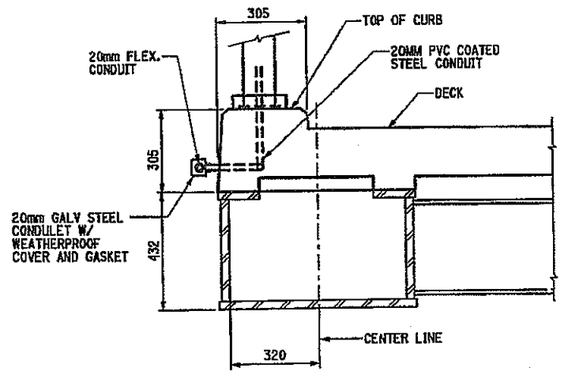
SECTION E14 - E14



SECTION E7 - E7



SECTION E6 - E6



SECTION E11 - E11

AS-BUILT REVISIONS

SIGNATURE DATE

ELECTRICAL DETAILS 2

BARBARA THAYER, P.C.
250 WEST 43RD STREET
NEW YORK, NEW YORK

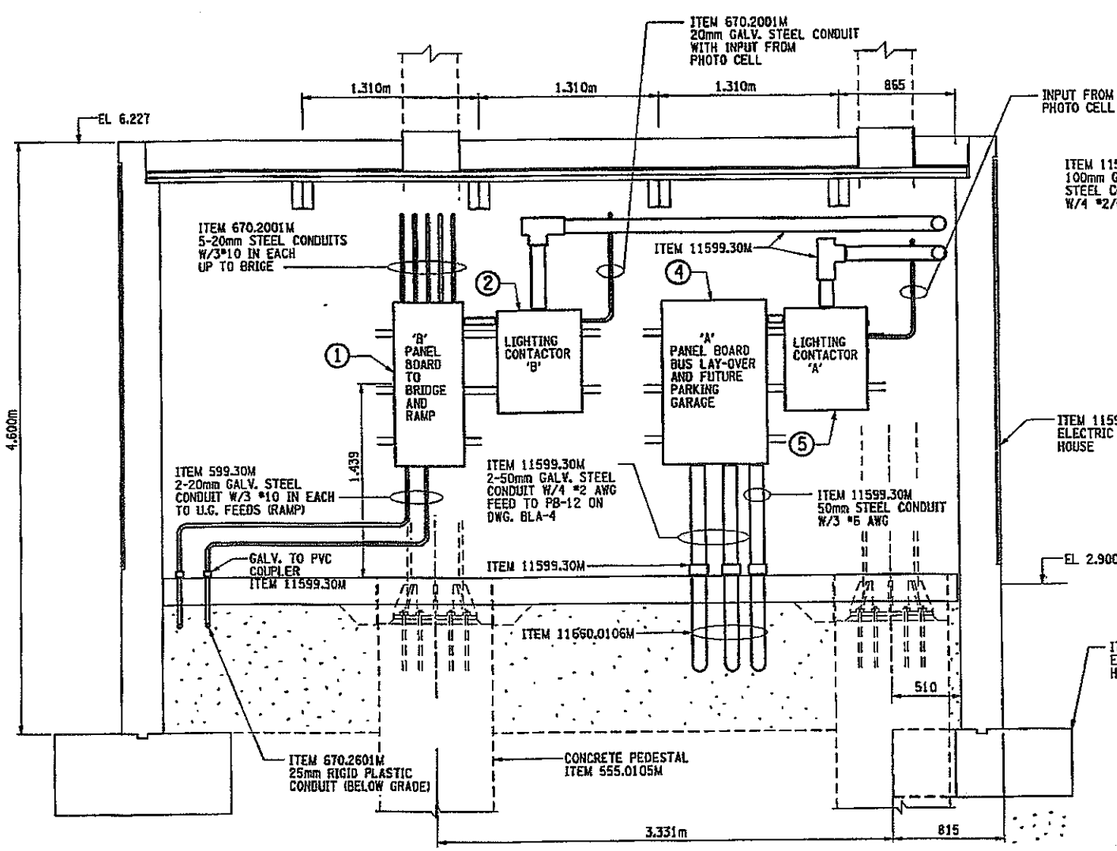
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
L-7	DEC. 2000	N.T.S	

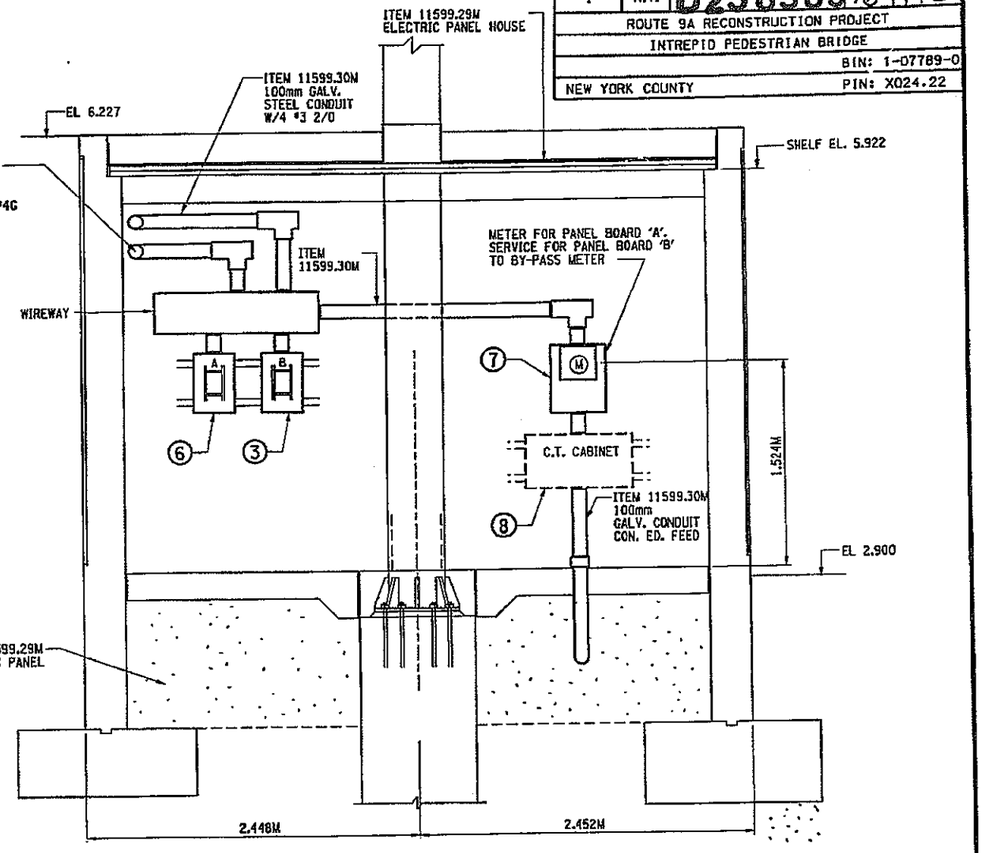
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	76	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY
PIN: X024.22

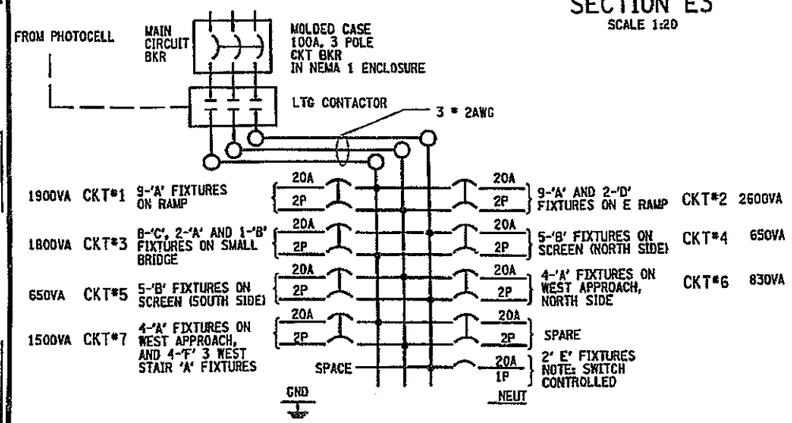
ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS DESIGNED BY: CF, AS CHECKED BY: BT IN CHARGE OF: BT



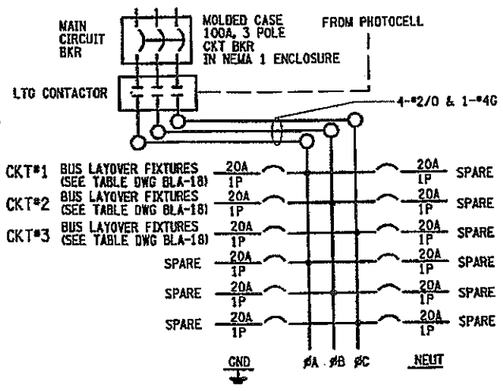
SECTION E3
SCALE 1:20



SECTION E2
SCALE 1:20



'B' PANEL BOARD AND LOADS
NOT TO SCALE



'A' PANEL BOARD
NOT TO SCALE

SERVICE EQUIPMENT (ITEM 11599.30M)

1- PANEL BOARD - 3 PHASE - 4 WIRE - COPPER BUS
- 120/208 VOLT - BOLT ON BKR'S
- 100 AMP MAIN LUGS ONLY
- 6 EA - 20 AMP 2 POLE CKT BKR'S
- COPPER GROUND AND NEUTRAL
- NEMA 1 INDOOR ENCLOSURE
- SURFACE MOUNTED
TYPES: WESTINGHOUSE
SQD
CROUSE HINDS

2 AND 5 - LIGHTING CONTACTOR
3 PHASE
100 AMP
TYPES: ASCO 920

3 AND 6 - 100 AMP, 3 PHASE, MOLDED CASE MAIN CKT BREAKER WITH NEMA 1 ENCLOSURE

4- SAME AS NO. 1 EXCEPT:
12 EA - 20 AMP 1 POLE CKT BKR'S

7- 200 AMP METER TO BE SUBMITTED TO UTILITY COMPANY FOR APPROVAL

8- C.T. CABINET. SUBJECT TO UTILITY COMPANY APPROVAL

WORK SHALL BE PAID UNDER ITEMS AS SHOWN

AS-BUILT REVISIONS

SIGNATURE DATE

INTERIOR WALL ELEVATIONS AND ELECTRICAL SERVICE EQUIPMENT

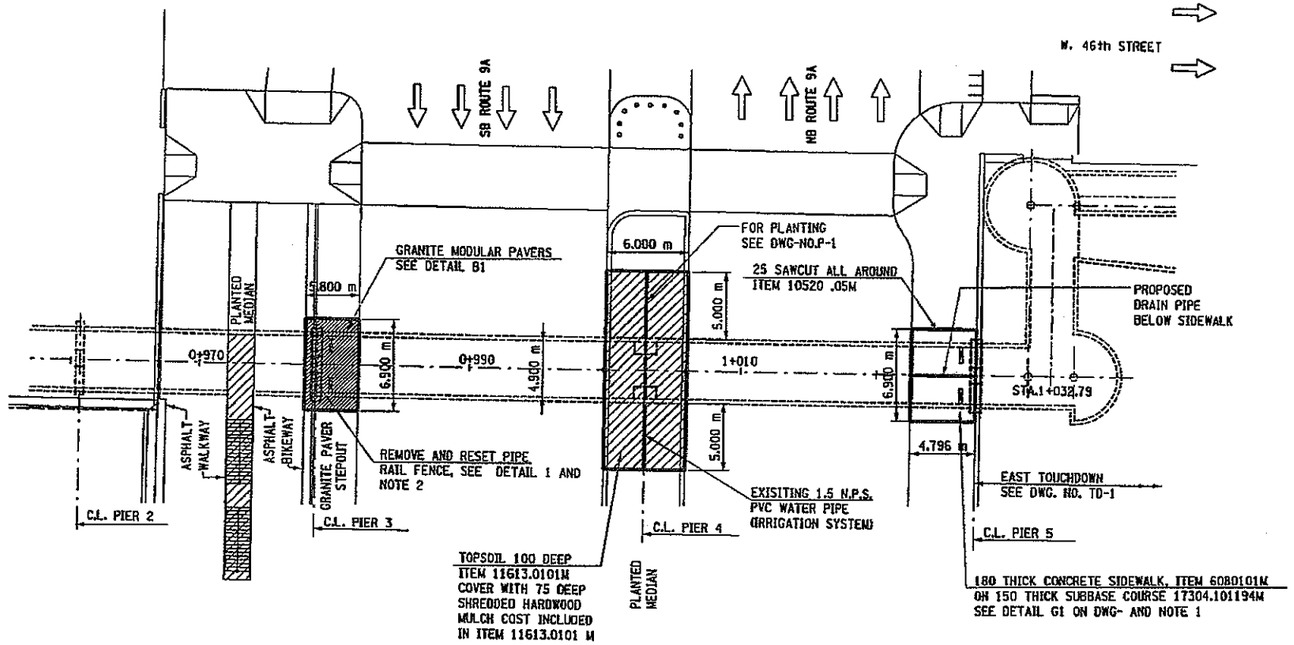
BARBARA THAYER, P.C.
880 WEST END STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
L-8	DEC. 2000	AS SHOWN	EARTH TECH

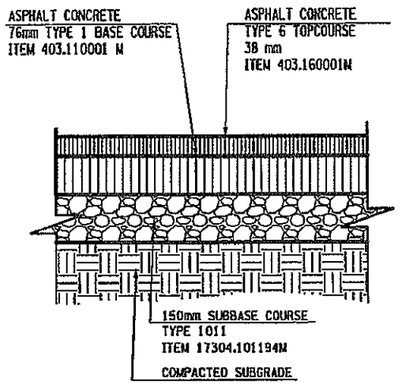
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	77	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22

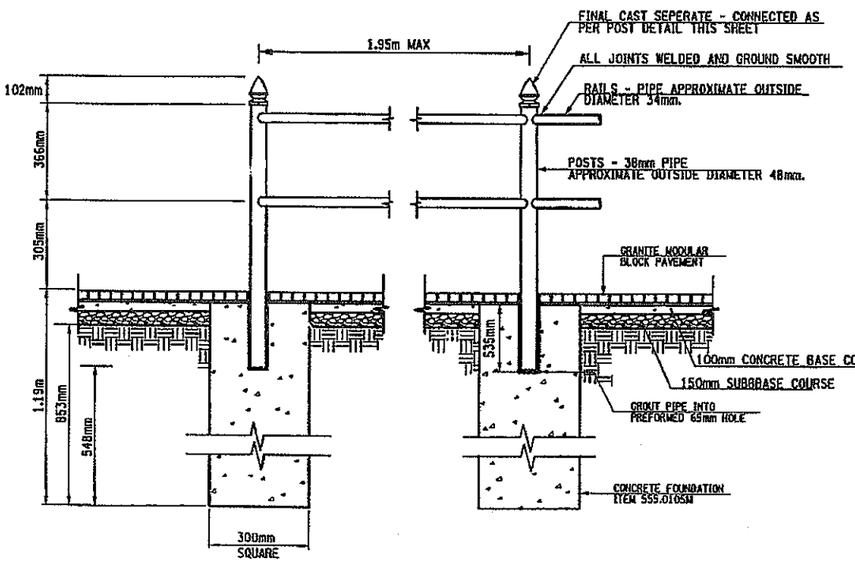


PLAN

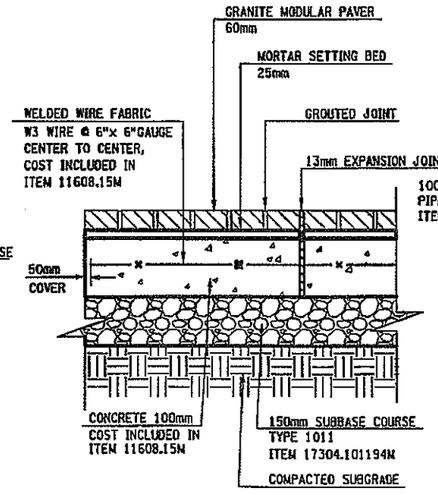
NOTES:
1. MATCH EXISTING SIDEWALK SCORING
2. COST FOR REMOVING AND RESETTING PIPE RAIL FENCE TO BE INCLUDED IN THE VARIOUS BID ITEMS.



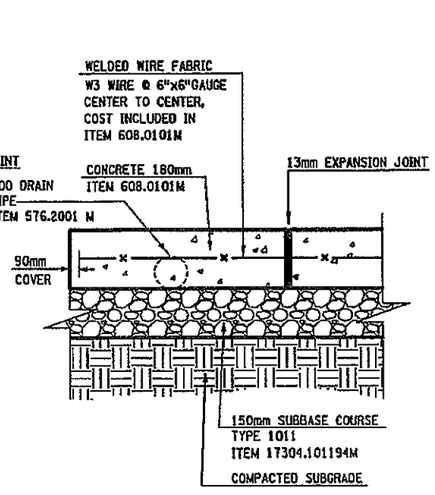
DETAIL J1



DETAIL 1



DETAIL B1



DETAIL G1

AS-BUILT REVISIONS

SIGNATURE DATE

RESTORATION PLAN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
RP-1	DEC. 2000	1:200	EARTH TECH

CHECKED BY:
DRAFTED BY:
CHECKED BY:
ESTIMATED BY:
CHECKED BY:
DESIGNED BY:
IN CHARGE OF:

PSHEET
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FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	78	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

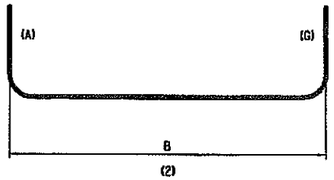
NEW YORK COUNTY — PIN: X024.22

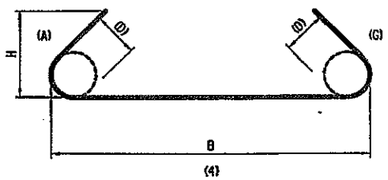
MARK	SIZE	LENGTH (M)	NO RQ.	TYPE	DETAIL DIMENSIONS													REMARKS
					A	B	C	D	E	F	G	H	I	J	K	K1	K2	
PIER 1 FOUNDATION																		WEIGHT (KG)
19F1	19	4.245	7	2	560	3125					560							66
19F2	19	2.805	11	2	540	1725					540							69
19F3	19	2.700	2	3	1050	1650												12
19F4	19	3.800	2	3	1050	2750												17
13F5	13	0.930	12	4	165	600		50			165	150						11
19F6	19	2.805	11	2	540	1725					540							69
19F7	19	4.245	7	2	560	3125					560							66
13P1	13	1.080	22	5		870	212					150			150			23.6
13P2	13	2.770	14	2	585	1640					585							38.5
PIER 2 FOUNDATION																		
19F1	19	4.245	15	2	560	3125					560							142
19F2	19	3.355	11	2	540	2275					540							83
19F3	19	3.250	2	3	1050	2200												15
19F4	19	3.800	2	3	1050	2750												17
13F5	13	0.930	12	4	165	600		50			165	150						11
19F6	19	3.355	11	2	540	2275					540							83
19F7	19	4.245	8	2	560	3125					560							76
13P1	13	0.580	24	5		370	212					150			150			13.8
13P2	13	3.050	8	2	725	1640					725							24.3

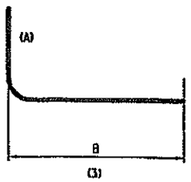
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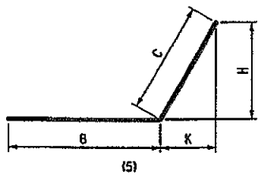
NIC

BAR TYPES









NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED

AS-BUILT REVISIONS

SIGNATURE — DATE

BAR LIST - PIERS 1 AND 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BL-1	DEC. 2000	N.T.S.	

J.M. CHECKED BY: J.B. DRAFTED BY: A.K. CHECKED BY: J.B. ESTIMATED BY: J.D. CHECKED BY: J.B. DESIGNED BY: N.S. IN CHARGE OF:

BJORKMAN
12 DEC 2000 - 12:22
C:\BENTLEY\PROGRAM\MICROSTATION\PLOTDRV\PRINTER.PLT
C:\CADD\INTREPID-BRIDGE\ADP\X024226A.LID

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	79	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

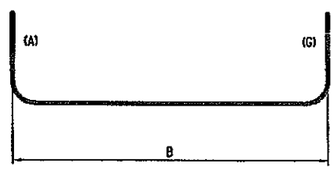
NEW YORK COUNTY — PIN: X024.22

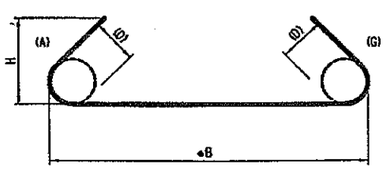
MARK	SIZE	LENGTH (M)	NO RQ.	TYPE	DETAIL DIMENSIONS A	B	C	D	E	F	G	H	I	J	K	K1	K2	REMARKS
TOWER FOUNDATION (PIER 4)																		WT (KG)
19F1	19	5.680	37	2	715	4.25m					715							495
19F2	19	6.980	14	2	715	5.55m					715							230
29F3	29	5.620	37	2	685	4.25m					685							1052
22F4	22	6.970	29	2	710	5.55m					710							615
13F5	13	1.830	30	4	165	1.50m		50			165	150						52
19F6	19	5.550	4	STR		5.550m												40
19F7	19	4.250	4	STR		4.250m												38
13P1	13	3.150	14	2	985	1.220m					985							43.8
13P2	13	1.335	7	5		840	498					475			150			9.3
13P3	13	1.035	7	5		840	196					130			150			7.2
PIER 3 FOUNDATION																		
19F1	19	3.530	13	2	390	2.750m					390							108
19F2	19	4.530	16	2	390	3.750m					390							171
19F3	19	3.530	13	2	390	2.750m					390							108
22F4	22	4.520	16	2	385	3.750m					385							227
13F5	13	1.180	12	4	165	850		50			165	150						11
19F6	19	3.750	4	STR		3.750m												35
19F7	19	2.750	4	STR		2.750m												35
13P1	13	0.680	22	5		470	212					150			150			14.9
13P2	13	2.770	8	2	585	1640					585							22.0

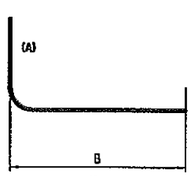
NIC

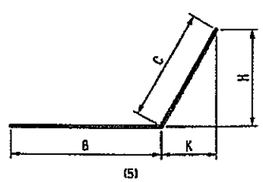
NIC

BAR TYPES









NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST - PIERS 3 AND 4

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BL-2	DEC. 2000	N.T.S.	

J.M. CHECKED BY: R.L. DRAFTED BY: J.M. CHECKED BY: A.K. ESTIMATED BY: R.H. CHECKED BY: R.H. DESIGNED BY: N.S. IN CHARGE OF:

PROMIS
121180
L:\WORK\22822\Cad\INTREPID-BRIDGE\ADP\X024222CA.L10
C:\BENTLEY\MICROSTATION\PLOTDRV\PRINTER.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	80	142

ROUTE 9A RECONSTRUCTION PROJECT

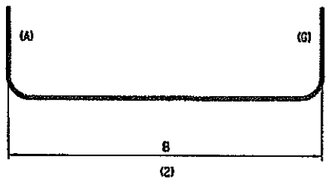
INTREPID PEDESTRIAN BRIDGE

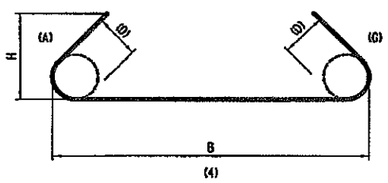
BIN: 1-07789-0

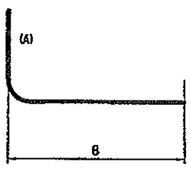
NEW YORK COUNTY PIN: X024.22

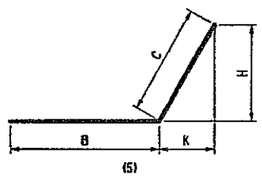
MARK	SIZE	LENGTH (M)	NO RQ.	TYPE	DETAIL DIMENSIONS													REMARKS
					A	B	C	D	E	F	G	H	I	J	K	K1	K2	
(PIER 5)																		WT (KG)
19F1	19	6.910	12	2	1300	4350					1800							185.3
19F2	19	3.350	15	STR														112.3
19F3	19	3.350	15	STR														112.3
19F4	19	7.910	12	2	1800	4350					1800							212.1
19F5	19	3.350	4	STR														29.9
19F6	19	4.350	4	STR														38.9
13F7	13	3.280	20	4	115	3050		50			115	80						65.2
13P1	13	0.910	22	5		700	212					150			150			19.9
13P2	13	2.770	12	2	585	1640					585							33.0

BAR TYPES









NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST - PIER 5

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

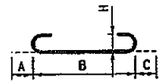
DWG. NO.	DATE	SCALE	EARTH TECH
BL-3	DEC. 2000	N.T.S.	

J.M. CHECKED BY: A.K. DRAFTED BY: J.M. CHECKED BY: A.K. ESTIMATED BY:

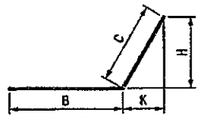
IN CHARGE OF: N.S. DESIGNED BY: R.H. CHECKED BY: A.K. ESTIMATED BY:

PGAMELL
12/18/00
L:\WORK\32022\CADD\INTREPID-BRIDGE\ADP\X024220A.L1D
L:\WORK\32022\MICROSPACE\SYSTEM\PLOTDRV\PRINTER4.PLT

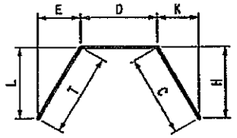
MARK	NO.	LENGTH	TYPE	WEIGHT	A	B	C	D	E	F	G	H	J	K	L	R	S	T
MAINSPAN																		
16SB201	440	4830	STR	3298.3														
13SB202	33	13050	STR	428.2														
13SB203	99	8290	STR	816.1														
13SB204	33	12550	STR	414.8														
16STE205	440	5325	1	3636.3	175	4830	175					130						
13STE206	33	12550	STR	411.8														
13STE207	99	8490	STR	835.8														
13STE208	33	13250	STR	434.8														
13SC209	4	12550	STR	49.9														
13SC210	12	8290	STR	98.9														
13SC211	4	13050	STR	51.9														
13SE212	880	670	3	586.1			212	255	18			205		55	205			206
13SE213	16	965	STR	15.3														
13S213	16	965	STR	15.3														
13SE214	48	500	2	23.9		315	190					135		135				
13SE215	4	4830	STR	19.2														
13SE216	16	1140	2	18.1		845	300					210		210				
13S216	16	1140	2	18.1		845	300					210		210				
TOTAL WEIGHT UNCOATED BARS = 5191.5 KG																		
TOTAL WEIGHT EPOXY COATED BARS = 5981.3 KG																		
WEST RAMP																		
13S301	10	6570	1	65.3	830	4790	830					107						
13SE302	120	6540	1	780.1	830	4790	830					55						
13S303	15	8730	STR	130.2														
13S304	15	18000	STR	268.4														
13S305	15	13060	STR	194.7														
13SE306	15	3030	2	45.2		2860	173					120		125				
13SE307	15	1780	1	26.5	300	1060	300					107						
13S308	16	12000	STR	190.8														
13SE309	3	16030	STR	47.8														
13SE310	3	16970	STR	50.6														
13SE311	3	4570	STR	13.6														
13SE312	3	16080	STR	48														
13SE313	3	18000	STR	53.7														
13SE314	3	6060	STR	18.1														
13SE315	132	4550	STR	597														
13SE316	15	13850	STR	206.5														
13SE317	15	18000	STR	268.4														
13SE318	15	6860	STR	102.3														
13SE319	32	12000	STR	381.7														
13SE320	2	1795	4	3.6		800	235	800										
13SE321	130	555	3	71.7			170	240	16			170		30	174			175
13SE322	124	555	3	68.4			170	240	16			170		30	174			175
13SE323	1	1795	4	1.8		800	235	800										
13SE324	1	1795	4	1.8		800	235	800										
13SE325	1	1795	4	1.8		800	235	800										
13SE326	1	1795	4	1.8		800	235	800										
13SE327	24	500	2	11.9		315	190					135		135				
13SE328	2	4800	STR	19.2														
TOTAL WEIGHT UNCOATED BARS = 849.4 KG																		
TOTAL WEIGHT EPOXY COATED BARS = 2821.5 KG																		



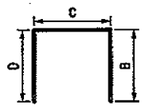
TYPE 1



TYPE 2



TYPE 3



TYPE 4

BAR BENDING DIAGRAMS

ALL BAR DIMENSIONS OUT TO OUT UNLESS OTHERWISE INDICATED

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	81	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07769-0

NEW YORK COUNTY PIN: X024.22

AS-BUILT REVISIONS

SIGNATURE DATE

BARLIST - WEST APPROACH AND MAIN SPAN DECK SLABS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BL-4	DEC. 2000	N.T.S.	

DESIGNED BY: J.S./R.H. CHECKED BY: J.D./R.H. ESTIMATED BY: A.K. CHECKED BY: A.K. DRAFTED BY: J.M. CHECKED BY: N.S. IN CHARGE OF:

BJORKMAN
12 DEC 2000
C:\BENTLEY\PROJECTS\ADOLLAR\TREE1\D-BRIDGE\PSHEET\X024222EP.PLT0
C:\BENTLEY\PROJECTS\ADOLLAR\TREE1\D-BRIDGE\DGN\X024222EP.DGN

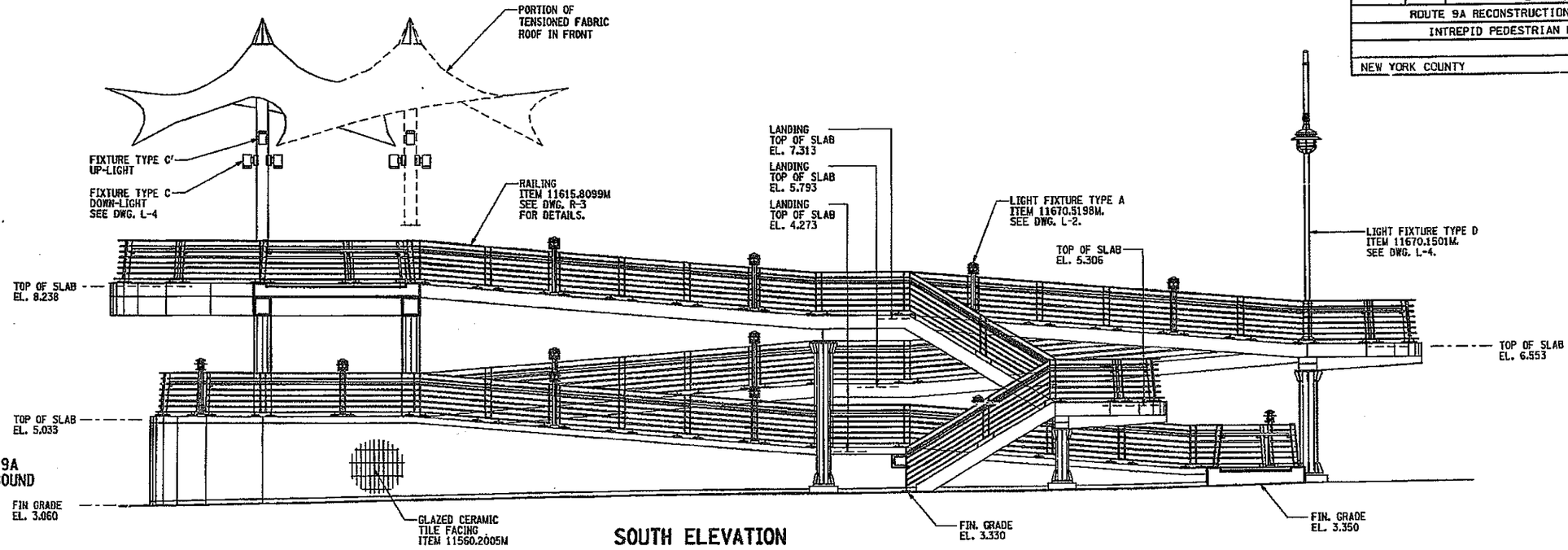
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583 82		142

ROUTE 9A RECONSTRUCTION PROJECT

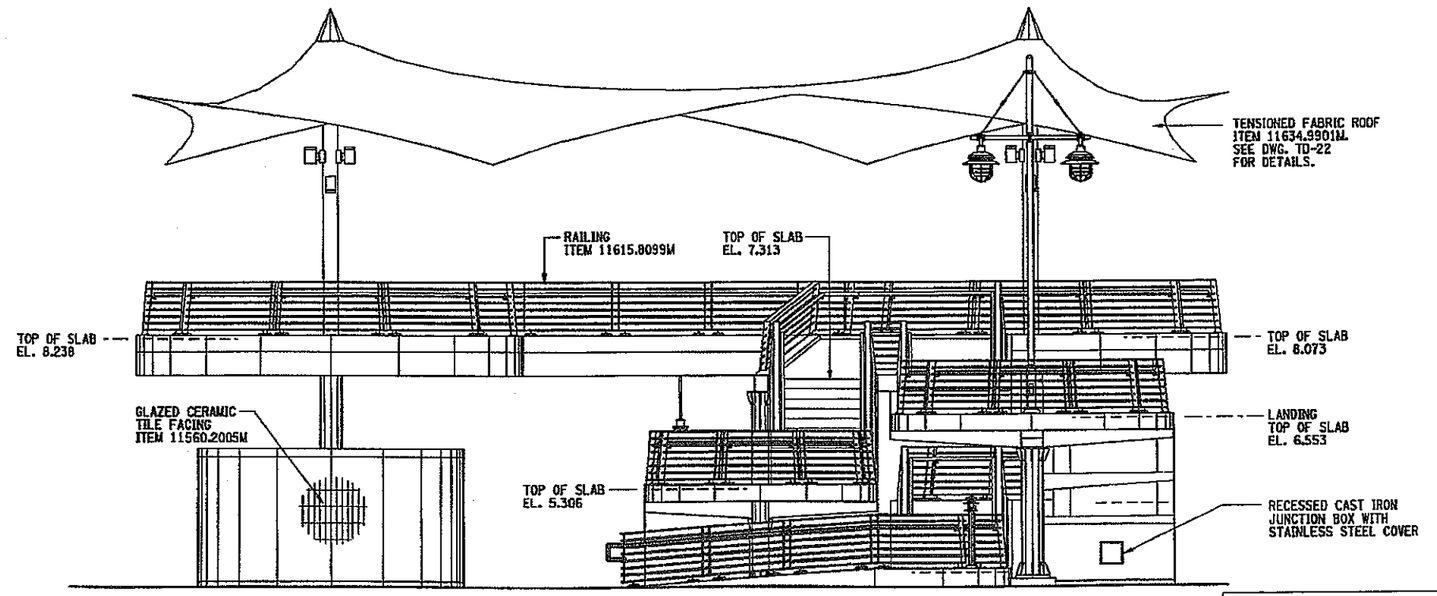
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



SOUTH ELEVATION



EAST ELEVATION

NOTES:

1. FOR CERAMIC TILE DETAILS, SEE DWG. TD-14
2. CERAMIC TILE COLOR TO MATCH FEDERAL STANDARD COLOR 27769

AS-BUILT REVISIONS

SIGNATURE DATE

ELEVATIONS 1
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-1	DEC. 2000	1 : 50

BARBARA THAYER, P.C.
350 WEST 42ND STREET
NEW YORK, NEW YORK

EARTH TECH

DESIGNED BY: OF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, IV CHECKED BY: JV
ESTIMATED BY: FS CHECKED BY: JV, FS
IN CHARGE OF: BT

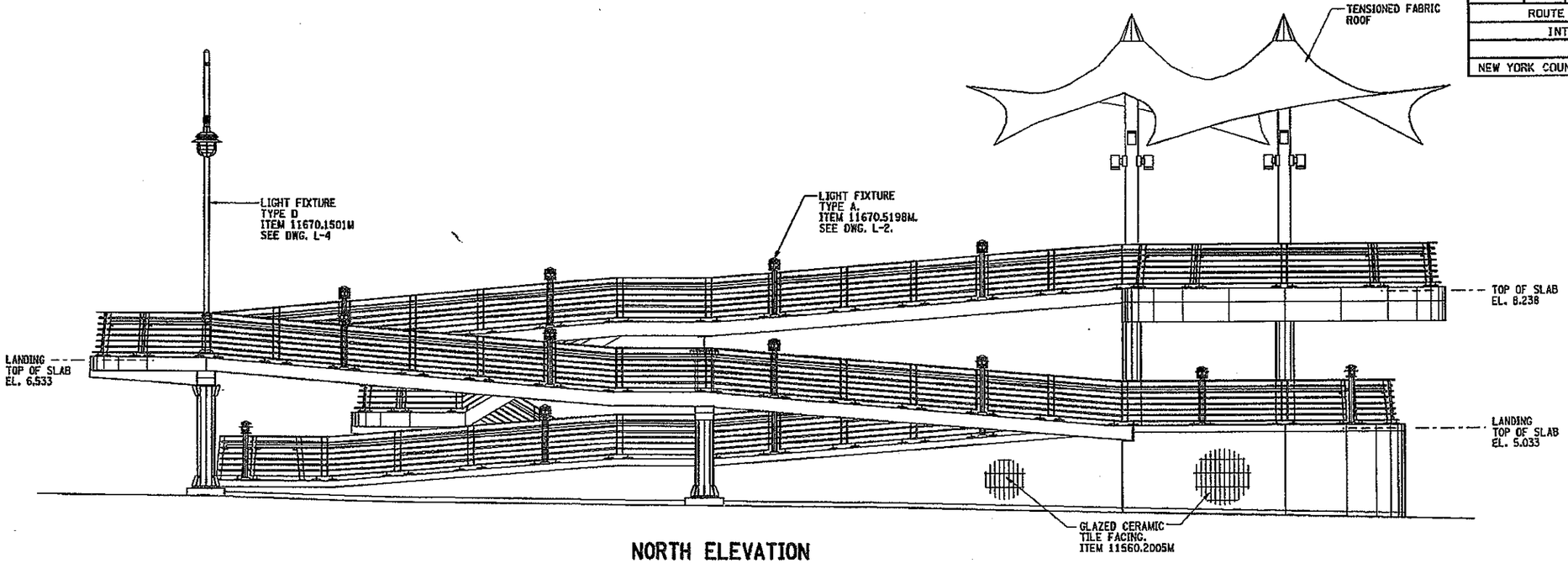
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	83	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

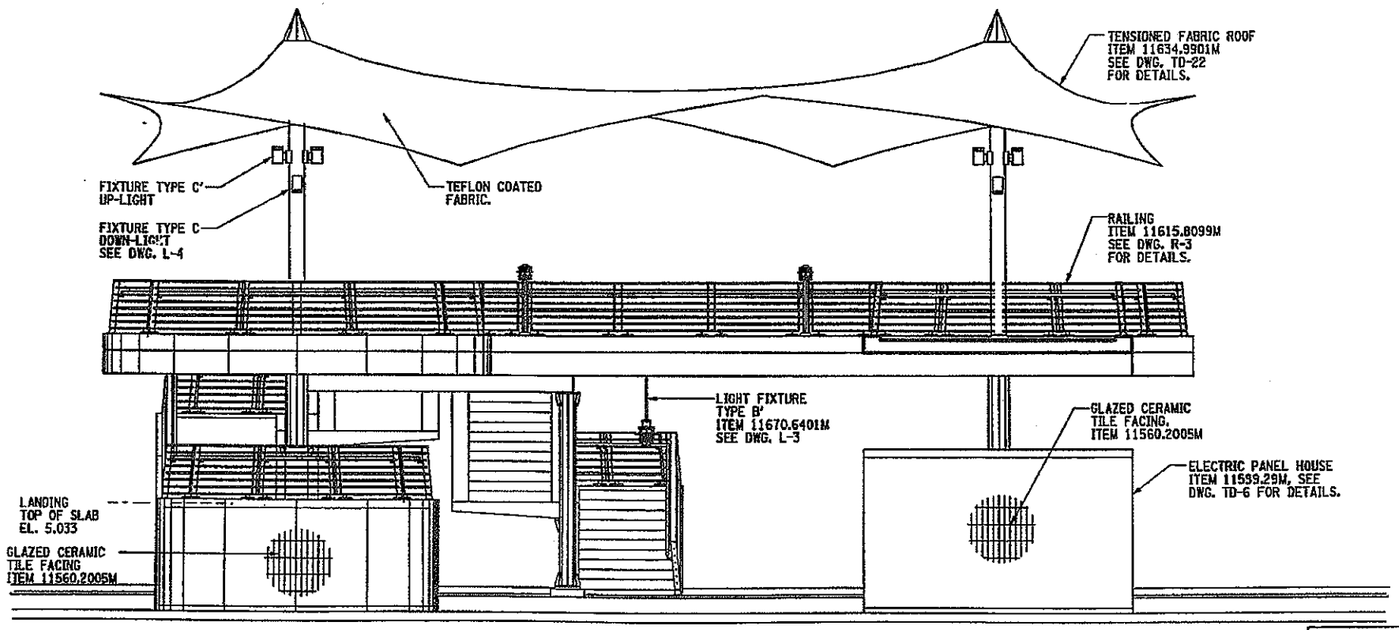
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



NORTH ELEVATION

ROUTE 9A
NORTHBOUND



WEST ELEVATION

AS-BUILT REVISIONS

SIGNATURE DATE

ELEVATIONS 2
EAST TOUCHDOWN

BARBARA THAYER, P.C.
200 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-2	DEC. 2000	1:50	EARTH TECH

DESIGNED BY: GF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV CHECKED BY: JV
ESTIMATED BY: FS CHECKED BY: JV, FS
IN CHARGE OF: BT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	84	142

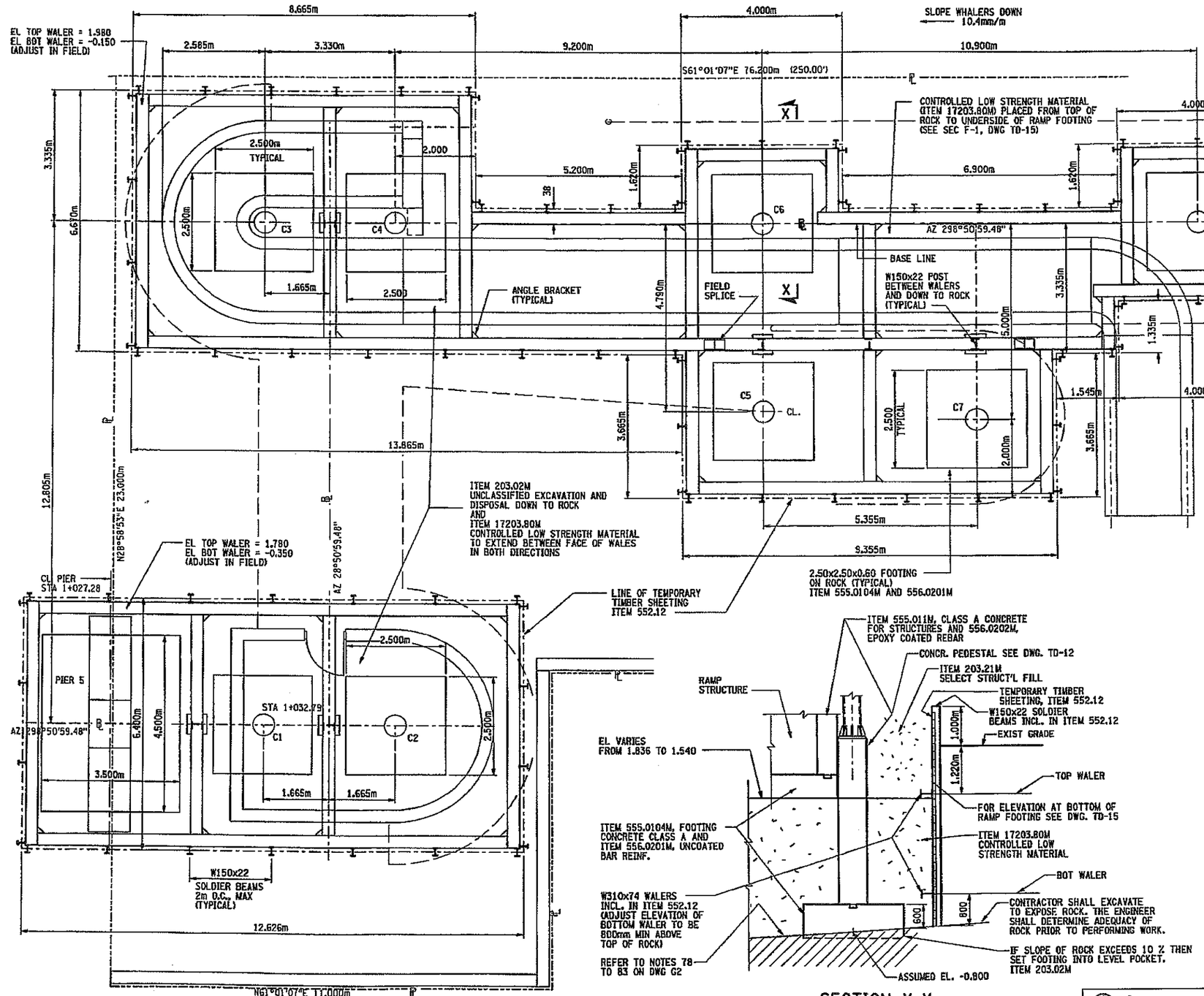
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

ASSUMED SOIL DATA	
FRICTION ANGLE	= 28°
UNIT WEIGHT	= 1900 KG/CU M
SURHARGED LOAD	= 6.25 KPA



SECTION X-X

DETAIL Z
SCALE 1:10

AS-BUILT REVISIONS

SIGNATURE DATE

DEEP FOOTINGS AND EXCAVATION PLAN

BARBARA THAYER, P.C.
880 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-3	DEC. 2000	1:50	EARTH TECH

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS ESTIMATED BY: FS DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	BS	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

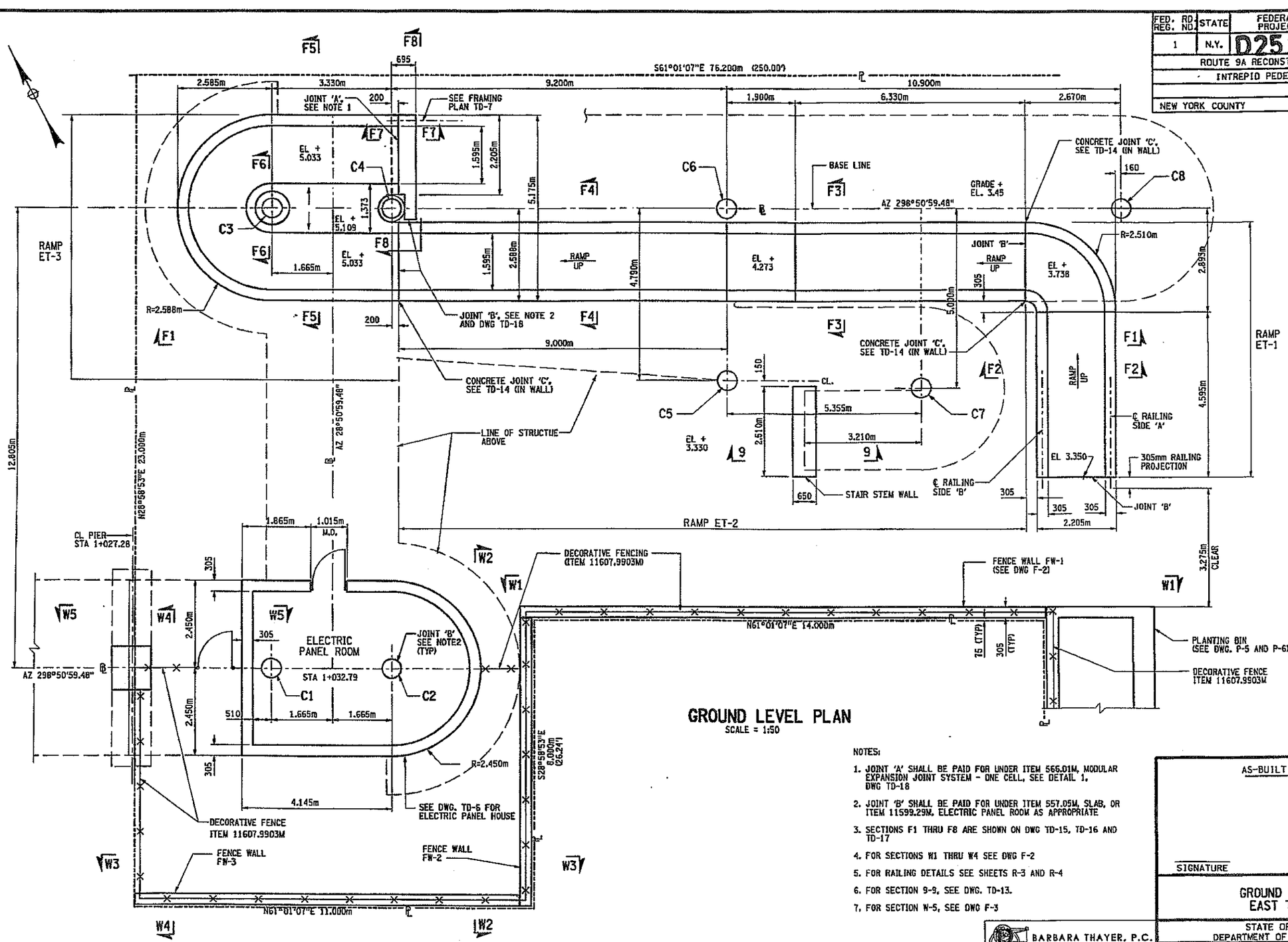
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024-22

DESIGNED BY: GF, AS — DRAFTED BY: EL, RM, IV — CHECKED BY: JV, FS

ESTIMATED BY: FS — CHECKED BY: JV — DRAFTED BY: JV, FS

IN CHARGE OF: BT



GROUND LEVEL PLAN

SCALE = 1:50

NOTES:

1. JOINT 'A' SHALL BE PAID FOR UNDER ITEM 566.01M, MODULAR EXPANSION JOINT SYSTEM - ONE CELL, SEE DETAIL 1, DWG TD-18
2. JOINT 'B' SHALL BE PAID FOR UNDER ITEM 557.05M, SLAB, OR ITEM 11599.29M, ELECTRIC PANEL ROOM AS APPROPRIATE
3. SECTIONS F1 THRU F8 ARE SHOWN ON DWG TD-15, TD-16 AND TD-17
4. FOR SECTIONS W1 THRU W4 SEE DWG F-2
5. FOR RAILING DETAILS SEE SHEETS R-3 AND R-4
6. FOR SECTION 9-9, SEE DWG. TD-13.
7. FOR SECTION W-5, SEE DWG F-3

AS-BUILT REVISIONS

SIGNATURE — DATE

GROUND LEVEL PLAN
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
660 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE	
TD-4	DEC. 2000	1:50	EARTH TECH

FED. RD REG. NO	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	85F1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

RAMP ET-4 — RAMP ET-5

9.000m — 1.900m — 9.000m

S61°01'07"E 76.200m (250.00')

℄ RAILING SIDE 'K' — ℄ RAILING SIDE 'B'

EL 8.121 — EL 8.121 — EL 8.073 — EL 8.067 — EL 8.114

RAMP UP — JOINT 'A' SEE NOTE 1 (TYP) — JOINT 'A' SEE NOTE 1 — JOINT 'A'

℄ RAILING SIDE 'A' — 305 NOMINAL — 765 — 200

1.595m — 2.205 — 3.145m — 4.790m — 1.900m

EL + 5.793 — EL + 7.313 — EL + 5.306 — EL + 3.30

RAMP UP — 1.595m — 5.000m — 2.588m — 5.175m

AZ 298° 50' 59.48" — EL. 6.553 — R=2.588m — RAMP ET-6

CL. RAILING SIDE 'B' — R=2.110m — RAILING SIDE 'F'

CL. RAILING SIDE 'C' — RAILING SIDE 'E'

R=3.530m — 13.884m — 12.805m — RAMP ET-9

℄ RAILING SIDE 'K' — N28°58'53"E 23.000m — 6.860m

305 — 3.120m — 305 — 5.175m

CL. RAILING SIDE 'K' — CL. RAILING SIDE 'D' — RAMP ET-8

CL PIER 5 STA. 1+027.28 — 200 — 200

AZ 28°50'59.48" — EL. 8.197 — EL. 8.210 — EL. 8.205

1.665m — 1.665m — R=3.530

N61°01'07"E 14.000m

EL. 8.238 — AZ 298°50'59.48" — EL 8.238 — STA 1+032.79 — EL. 8.238 — EL. 8.205

4.882 — 7.060m — S28°58'53"E 8.000m (26.24')

EL. 8.233 — EL. 8.266 — EL. 8.279 — ℄ RAILING SIDE 'D'

CL. PROTECTIVE SCREENING — 3.845m — 3.330m — 10.705m

5.355m — RAMP ET-7

'N61°01'07"E 11.000m

P L A N

SCALE = 1:75

CLOUDED AREA DENOTES CHANGES

NOTES:

1. JOINT 'A' SHALL BE PAID FOR UNDER ITEM 566.01M. MODULAR EXPANSION JOINT SYSTEM - ONE CELL.
2. FOR SECTIONS SEE DWGS TD-8 TO TD-13
3. FOR RAIL DEVELOPED ELEVATIONS AND CLASSIFICATIONS SEE DWG. R-4 AND WAS-1

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 86
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

SIGNATURE — DATE

UPPER LEVEL PLAN
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-5	OCT. 10, 2001	AS SHOWN

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

EARTH TECH

ESTIMATED BY: FS — CHECKED BY: JV — DRAFTED BY: EL, RM, JV — CHECKED BY: JV, FS
IN CHARGE OF: BT — DESIGNED BY: GF, AS — CHECKED BY: JV, FS

SCHANDA
11/08/01
L:\WORK\46090\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\OCTOBER 15-18 2001\X02422CA.H3F
L:_GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

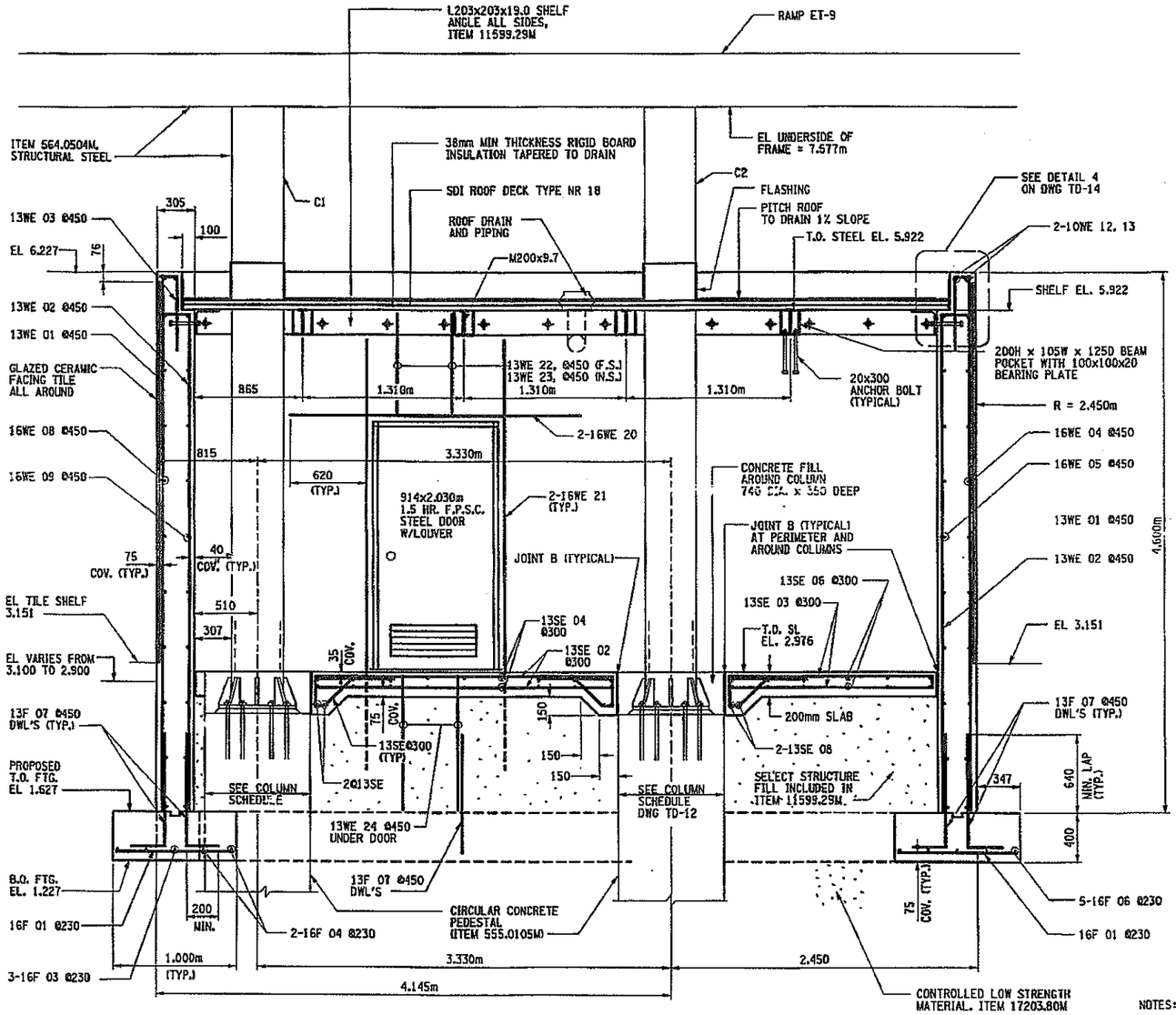
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583 87		142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

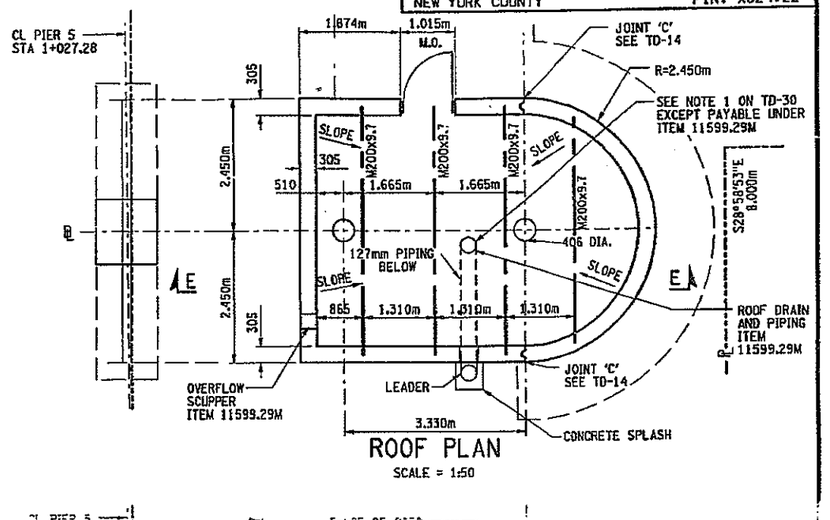
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



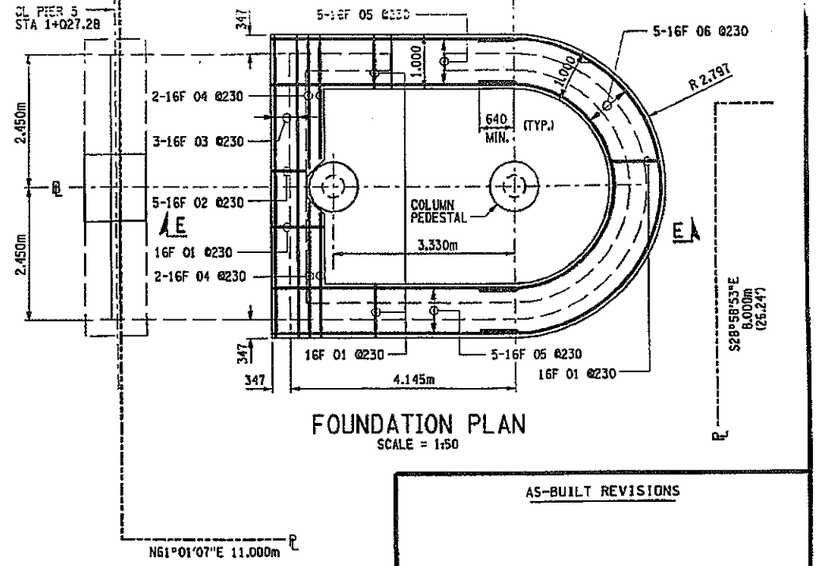
SECTION E-E

SCALE = 1:20



ROOF PLAN

SCALE = 1:50



FOUNDATION PLAN

SCALE = 1:50

NOTES:

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 11599.29M, UNLESS OTHERWISE INDICATED
2. SEE DRAWING TD-20 FOR REINFORCING PLAN OF SLAB-ON-GRADE
3. FOR JOINT 'B' SEE DWG TD-18
4. FOR FLASHING DETAILS SEE DWG TD-14

AS-BUILT REVISIONS

SIGNATURE DATE

ELECTRIC PANEL HOUSE
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-6	DEC. 2000	AS SHOWN

BARBARA THAYER, P.C.
250 WEST 49ND STREET
NEW YORK, NEW YORK

EARTH TECH

DESIGNED BY: CF, AS
CHECKED BY: JV
DRAFTED BY: EL, RM, IV
CHECKED BY: JV, FS
ESTIMATED BY: FS
IN CHARGE OF: BT

FED. RD REG. NO	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	88F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
				BIN: 1-07789-0
NEW YORK COUNTY				PIN: X024.22

BEAM SCHEDULE

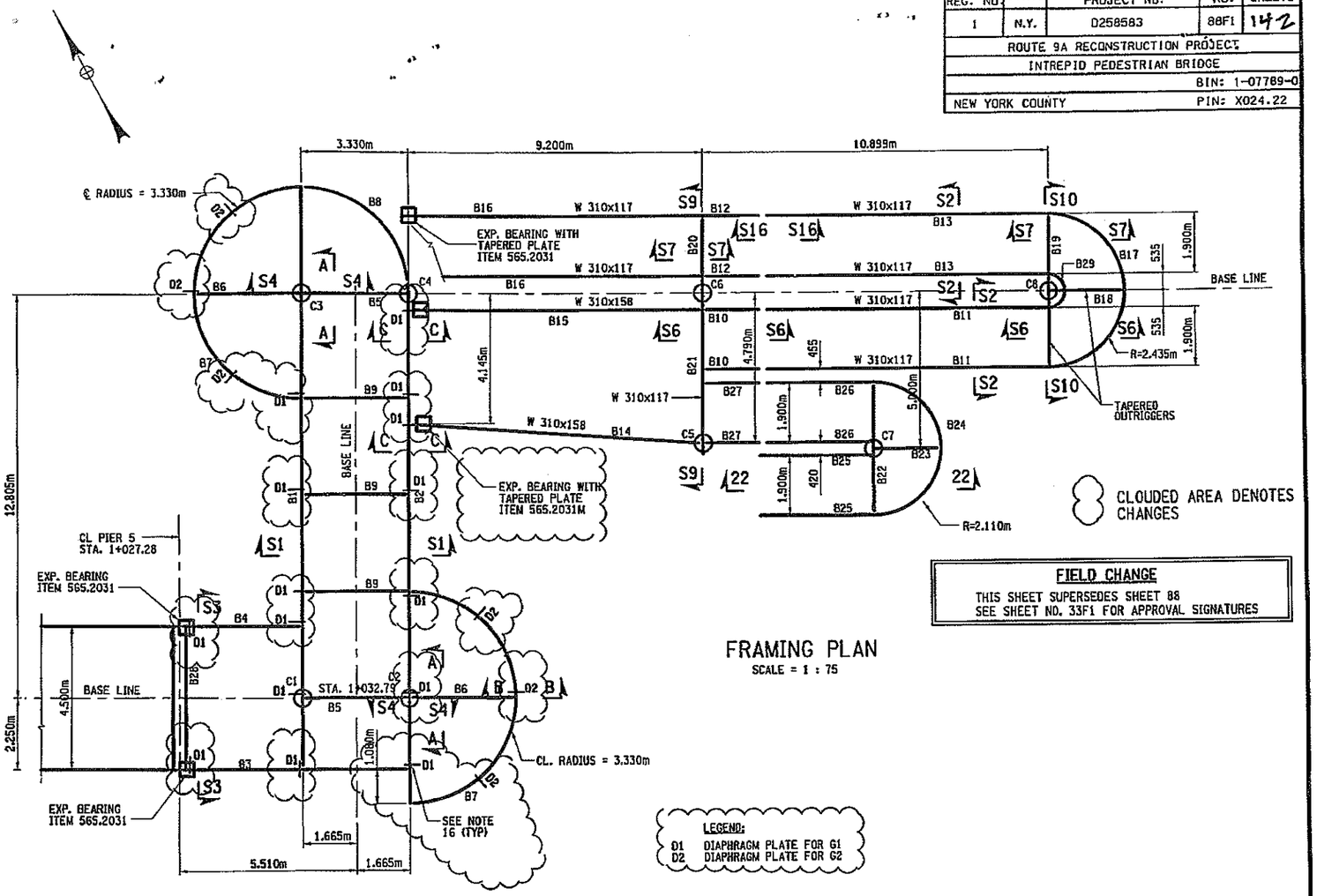
MARK	LENGTH *	COMMENT	SECTION	NOTE	QUANT	TENS. ZONES
B1	18.385	STRAIGHT	G1 (T*)	7	1	SEE SHT 88F2
B2	16.540	STRAIGHT	G1 (T*)	8	1	SEE SHT 88F2
B3	6.900	STRAIGHT	G1 (T*)	9	1	TFT
B4	3.570	STRAIGHT	G1 (T*)	9	1	BFT
B5	2.930	STRAIGHT	G1 (T*)	9	2	TFT
B6	2.925	STRAIGHT	G1 (T*)	7, 8	2	TFT
B7	10.060	CURVED	G2 (T*)	7, 8	2	TFT
B8	4.825	CURVED	G2 (T*)	9	1	TFT
B9	2.930	STRAIGHT	G2 (T*)	9	3	TFT
B10	1.900	HORIZONTAL	W310x117 (T)	10	2	-
B11	9.000	SLOPED	W310x117 (T)	10	2	-
B12	1.900	HORIZONTAL	W310x117 (T)	11	2	-
B13	9.032	SLOPED	W310x117 (T)	11	2	-
B14	9.065	SLOPED	W310x158 (T)		1	-
B15	9.030	SLOPED	W310x158 (T)		1	-
B16	9.030	SLOPED	W310x117 (T)		2	-
B17	7.650	CURVED	W310x117 (T)		1	-
B18	2.585	TAPERED	W360x134 (T)	3	1	-
B19	5.170	DOUBLE-TAPER	W360x134 (T)	3	1	-
B20	2.295	TAPERED	W360x134 (T)		1	-
B21	5.350	STRAIGHT	W310x117 (T)		1	-
B22	4.205	DOUBLE-TAPER	W360x134 (T)	15	1	-
B23	2.105	TAPERED	W360x134 (T)	15	1	-
B24	6.445	CURVED	W310x117 (T)		1	-
B25	3.950	SLOPED	W310x117 (T)		2	-
B26	3.950	SLOPED	W310x117 (T)		2	-
B27	1.900	STRAIGHT	W310x117 (T)		2	-
B28	4.14	STRAIGHT	G2 (T*)		1	BFT
B29	1.680	BUILT-UP	EQ W310x117 (T)	12	1	-
B30	5.010	SLOPED	W310x117 (T)	14	2**	-
B31	1.900	STRAIGHT	W310x117 (T)	14	2**	-
B32	5.340	SLOPED	W310x117 (T)	13	2**	-
B33	1.900	STRAIGHT	W310x117 (T)	13	2**	-
B34	2.200	STRAIGHT	W310x117 (T)		1**	-

ITEM 564.0504M

ITEM 564.0501M

NOTE: SUPPLEMENTARY REQUIREMENT FOR NOTCH TOUGHNESS SHALL APPLY FOR ALL COMPONENTS DESIGNATED (T)

LEGEND: TFT TOP FLANGE TENSION
BFT BOTTOM FLANGE TENSION
* REFER TO TENSION ZONES COLUMN
** SEE DRAWING WAS-1



FRAMING PLAN
SCALE = 1 : 75

FIELD CHANGE
THIS SHEET SUPERSEDES SHEET 88
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

LEGEND:
D1 DIAPHRAGM PLATE FOR G1
D2 DIAPHRAGM PLATE FOR G2

NOTES:

1. ALL STRUCTURAL STEEL FRAMING SHALL BE PAID FOR UNDER ITEM * 564.0504M U.O.N. INCL. CAP AND BASE ASSEMBLY, FASTENERS, PLATES, WELDING AND BOLTS.
2. FOR SECTIONS SEE DWGS TD-8 TO TD-13.
3. MEMBERS B18 AND B19 TO BE SHOP WELDED ASSEMBLY.
4. ADJUST LENGTH TO ALLOW FOR CLEARANCE OF MATING PIECES AND FOR ANGLE CUTS.
5. FOR ADDITIONAL FRAMING SEE WAS-1.
6. FOR BEARING DETAILS SEE DWG. TD-19.
7. MEMBERS B1, B6 AND B7 TO BE SHOP WELDED ASSEMBLY.
8. MEMBERS B2, B7 AND B6 TO BE SHOP WELDED ASSEMBLY.
9. MEMBERS B5 (2 PIECES), B4, B3, B9 (3 PIECES) AND B8 TO BE FIELD BOLTED.
10. MEMBERS B10 (HORIZONTAL) AND B11 (SLOPED) TO BE SHOP WELDED ASSEMBLY.
11. MEMBERS B13 (HORIZONTAL) AND B12 (SLOPED) TO BE SHOP WELDED ASSEMBLY.
12. FOR BUILT-UP EDGE BEAM, SEE SECTION S-10 AND S-15, DWG. TD-9.
13. STRINGERS B32 AND B33 TO BE SHOP WELDED ASSEMBLY.
14. STRINGERS B30 AND B31 TO BE SHOP WELDED ASSEMBLY.
15. MEMBERS B22 AND B23 TO BE SHOP WELDED ASSEMBLY.
16. DIAPHRAGM PLATES ADJACENT TO CONNECTIONS ARE LOCATED AT THE CENTERLINE OF THE INTERSECTING MEMBER.

AS-BUILT REVISIONS

SIGNATURE DATE

FRAMING PLAN AND DETAILS
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-7	OCT. 10, 2001	AS SHOWN

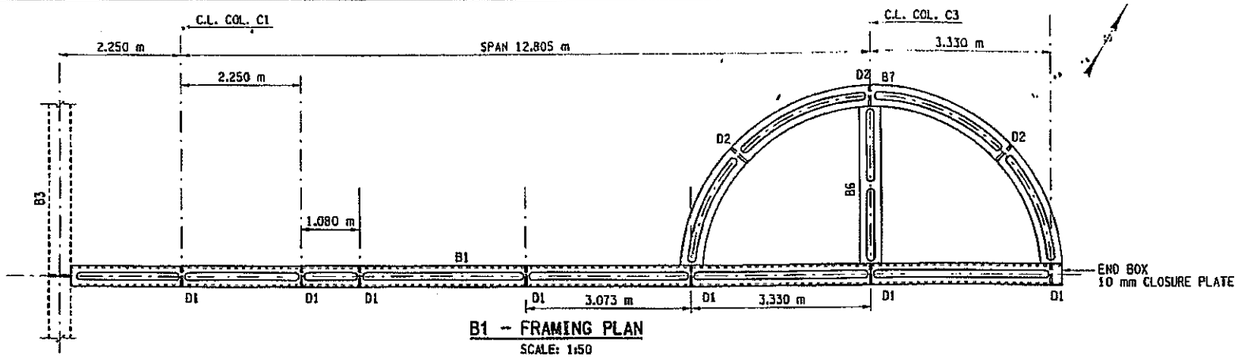
BARBARA THAYER, P.C.
ARCHITECT
NEW YORK, NEW YORK

EARTH TECH

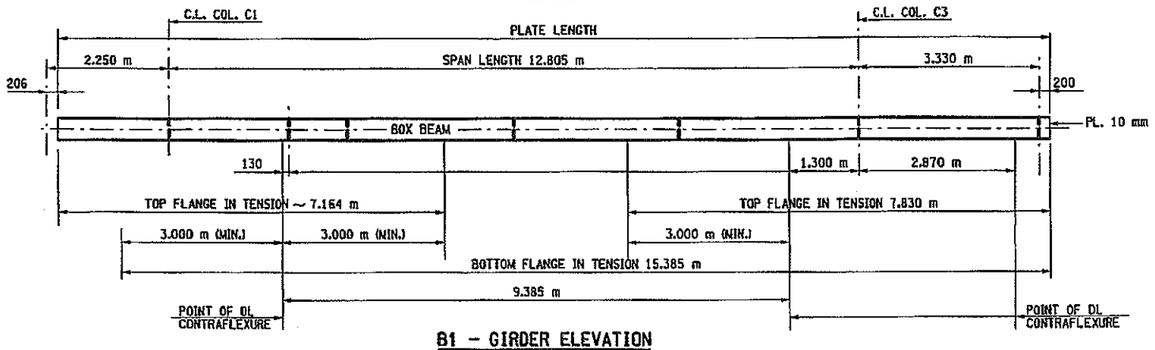
DESIGNED BY: CF, AS CHECKED BY: JV, FS
DRAFTED BY: EL RM, JV CHECKED BY: JV
CHECKED BY: FS ESTIMATED BY: JV, FS
IN CHARGE OF: BT

SCHANDA
L:\WORK\460900\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\OCTOBER 15-18 2001\X02422CA.F3A
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

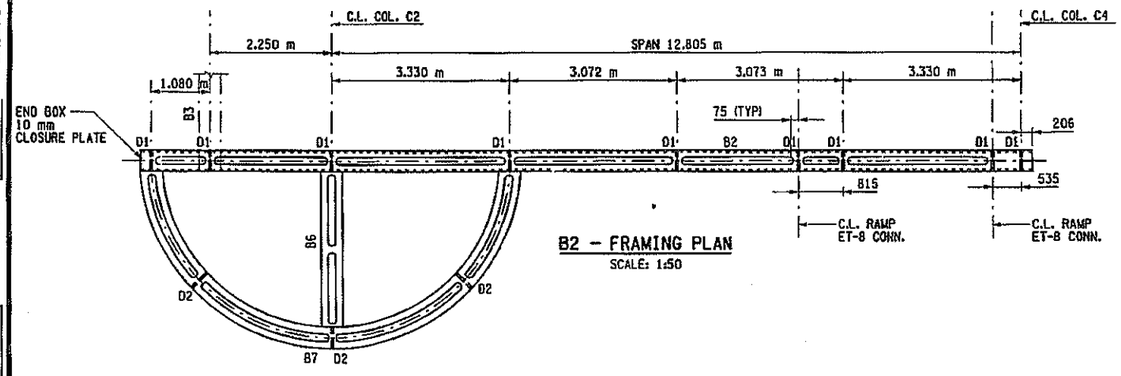
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	88F2	142
ROUTE 9A RECONSTRUCTION PROJECT,				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



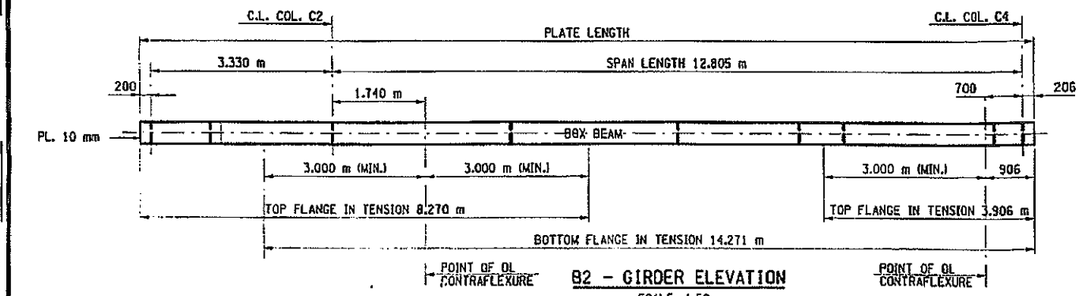
B1 - FRAMING PLAN
SCALE: 1:50



B1 - GIRDER ELEVATION
SCALE: 1:50



B2 - FRAMING PLAN
SCALE: 1:50



B2 - GIRDER ELEVATION
SCALE: 1:50

NOTES:

1. FOR BEAM SCHEDULE AND NOTES SEE DWG. TD-7.
2. LONGITUDINAL DIMENSIONS SHOWN ARE HORIZONTAL DIMENSIONS ALONG C.L. GIRDER AND REQUIRED ADJUSTMENTS FOR CAMBER AND FINISH GRADE.
3. ENDS OF GIRDER SHOULD BE FABRICATED SO THAT UNDER FULL DEAD LOAD THE ENDS ARE VERTICAL.
4. STIFFENERS AND DIAPHRAGM CONNECTION PLATES SHALL BE INSTALLED NORMAL TO THE GIRDER WEB AND FLANGES.
5. ALL UNITS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

FIELD CHANGE
THIS SHEET SUPPLEMENTS SHEET 88F1
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

SIGNATURE DATE

FRAMING PLAN AND DETAILS
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-7A	OCT. 2001	AS SHOWN

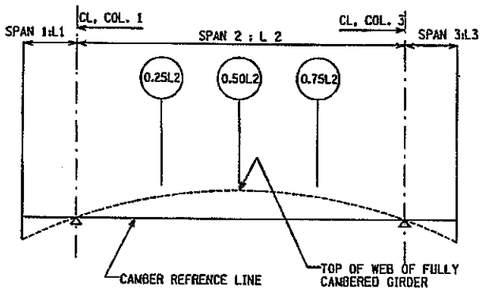
BARBARA THAYER, P.C.
330 WEST 42ND STREET NEW YORK, NEW YORK

EARTH TECH

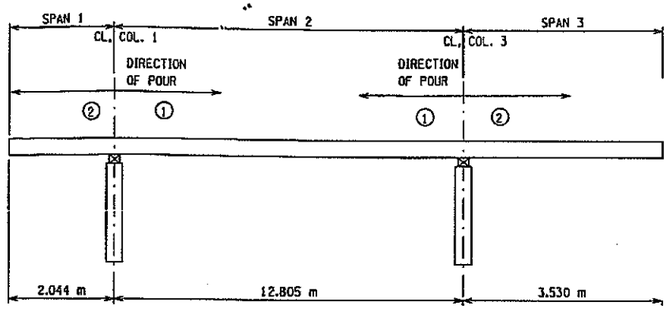
ESTIMATED BY: JM
CHECKED BY:
DRAFTED BY:
CHECKED BY:
CHECKED BY:
DESIGNED BY: JB/JD
IN CHARGE OF: NS

SECTION:
PROJECT:
U:\CAD\46980\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\88F2.DGN
U:\GENERAL\PLOTDRV\WYS DOT\WYSDOT11X17.PLT

CAMBERTABLE BEAM		BEGIN SPAN 1	CL COL. C1	0.25 L2	SPAN 2 0.50 L2	0.75 L2	CL COL. C3	END SPAN
B 1	STEEL D.L.	-0.001	0.000	0.002	0.003	0.003	0.000	-0.002
	CONCRETE D.L.	-0.003	0.000	0.007	0.010	0.008	0.000	-0.007
	SUPER IMPOSED D.L.	0.000	0.000	0.000	0.000	0.000	0.000	0.001
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	-0.004	0.000	0.009	0.013	0.011	0.000	-0.008



CAMBER DIAGRAM



BEAM 1

SUGGESTED CONCRETE PLACEMENT SEQUENCE

N.T.S.

① & ② =PLACEMENT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	88F3	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

CAMBER NOTES:

1. ALL CAMBERS ARE ASSUMED TO BE MEASURED VERTICALLY TO THE TOP OF FULLY CAMBERED WEB FROM A STRAIGHT REFERENCE LINE DRAWN FROM THE INTERSECTION OF TOP OF WEB AND CENTER LINE OF BEARING AT ONE END OF THE GIRDER TO THE INTERSECTION OF TOP OF WEB AND CENTER LINE OF BEARING AT THE OTHER END OF THE GIRDER.
2. THE CAMBER LABELED "VERTICAL CURVE" IN THE TABLE IS THE CAMBER REQUIRED IN THE GIRDER TO FOLLOW THE VERTICAL CURVE PROFILE GRADE.
3. CAMBERS LISTED IN THE TABLE AS POSITIVE ARE UPWARD CAMBERS.
4. THE CAMBERS ARE TABULATED IN METERS.

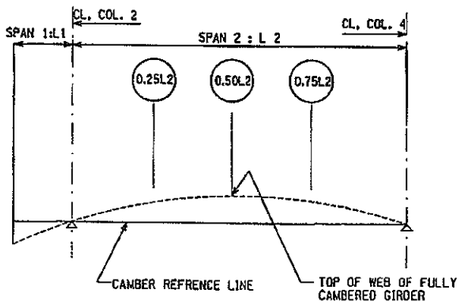
NOTE:

1. CONCRETE SHALL BE PLACED DURING A CONTINOUS WORK PERIOD.
2. SECTION ② CAN BE PLACED AFTER 50% OF PLACEMENT ① IS COMPLETE.

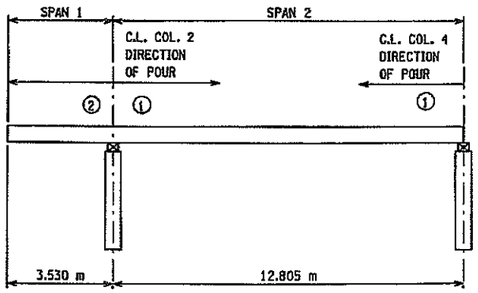
FIELD CHANGE

THIS SHEET SUPPLEMENTS SHEET 88F1
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

CAMBERTABLE BEAM		BEGIN SPAN 1	CL COL. C2	0.25 L2	SPAN 2 0.50 L2	0.75 L2	CL COL. C4
B 2	STEEL D.L.	-0.002	0.000	0.003	0.004	0.003	0.000
	CONCRETE D.L.	-0.007	0.000	0.008	0.011	0.009	0.000
	SUPER IMPOSED D.L.	0.001	0.000	0.000	0.000	0.000	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	-0.007	0.000	0.011	0.015	0.012	0.000



CAMBER DIAGRAM



BEAM 2

SUGGESTED CONCRETE PLACEMENT SEQUENCE

N.T.S.

① & ② =PLACEMENT

AS-BUILT REVISIONS

SIGNATURE DATE

CAMBER TABLES
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

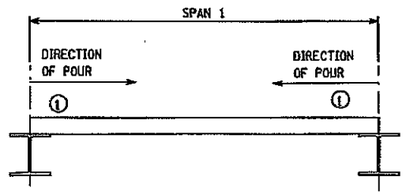
DWG. NO.	DATE	SCALE	
T0-78	OCT. 10, 2001	AS SHOWN	LARTH TECH

BARBARA THAYER, P.C.
2910 WEST 42ND STREET
NEW YORK, NEW YORK

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS ESTIMATED BY:
DRAFTED BY: EL, RM, JV CHECKED BY: JV
CHECKED BY: JV, FS
SCHANDA
11/08/01
L:\WORK\46090\CADD\FIELD_CHANGE_SHEETS\FIELDCHANGE\A1.DGN
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	88F4	142
ROUTE 9A RECONSTRUCTION"PROJECT				
INTREPID PEDESTRIAN BRIDGE				
				BIN: 1-07789-0
NEW YORK COUNTY				PIN: X024.22

CAMBERTABLE BEAM		BEGIN SPAN 1	0.25 L2	SPAN 1 0.50 L2	0.75 L2	END SPAN
B 10 + B 11	SPAN LENGTH (m.)	10.900				
	STEEL D.L.	0.000	0.002	0.003	0.002	0.000
	CONCRETE D.L.	0.000	0.009	0.012	0.010	0.000
	SUPER IMPOSED D.L.	0.000	0.004	0.005	0.004	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	0.000	0.015	0.019	0.016	0.000
B 12 + B 13	SPAN LENGTH (m.)	10.932				
	STEEL D.L.	0.000	0.002	0.003	0.002	0.000
	CONCRETE D.L.	0.000	0.009	0.012	0.010	0.000
	SUPER IMPOSED D.L.	0.000	0.003	0.005	0.004	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	0.000	0.014	0.019	0.016	0.000
B 14	SPAN LENGTH (m.)	9.065				
	STEEL D.L.	0.000	0.001	0.001	0.001	0.000
	CONCRETE D.L.	0.000	0.004	0.006	0.004	0.000
	SUPER IMPOSED D.L.	0.000	0.001	0.001	0.001	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	0.000	0.005	0.008	0.006	0.000
B 15	SPAN LENGTH (m.)	9.030				
	STEEL D.L.	0.000	0.000	0.001	0.001	0.000
	CONCRETE D.L.	0.000	0.002	0.004	0.003	0.000
	SUPER IMPOSED D.L.	0.000	0.000	0.001	0.001	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	0.000	0.003	0.006	0.004	0.000
B 16	SPAN LENGTH (m.)	9.030				
	STEEL D.L.	0.000	0.001	0.001	0.001	0.000
	CONCRETE D.L.	0.000	0.003	0.005	0.003	0.000
	SUPER IMPOSED D.L.	0.000	0.001	0.002	0.001	0.000
	VERTICAL CURVE	0.000	0.000	0.000	0.000	0.000
	TOTAL DEFLECTION	0.000	0.005	0.008	0.005	0.000

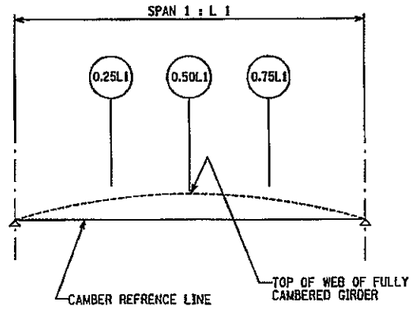


BEAM 10+11, BEAM 12+13,
BEAM 14, BEAM 15, BEAM 16

SUGGESTED CONCRETE PLACEMENT SEQUENCE

① =PLACEMENT

N.T.S.



CAMBER DIAGRAM

CAMBER NOTES:

1. ALL CAMBERS ARE ASSUMED TO BE MEASURED VERTICALLY TO THE TOP OF FULLY CAMBERED WEB FROM A STRAIGHT REFERENCE LINE DRAWN FROM THE INTERSECTION OF TOP OF WEB AND CENTER LINE OF BEARING AT ONE END OF THE GIRDER TO THE INTERSECTION OF TOP OF WEB AND CENTER LINE OF BEARING AT THE OTHER END OF THE GIRDER.
2. THE CAMBER LABELED "VERTICAL CURVE" IN THE TABLE IS THE CAMBER REQUIRED IN THE GIRDER TO FOLLOW THE VERTICAL CURVE PROFILE GRADE.
3. CAMBERS LISTED IN THE TABLE AS POSITIVE ARE UPWARD CAMBERS.
4. THE CAMBERS ARE TABULATED IN METERS.

NOTE:

1. CONCRETE SHALL BE PLACED DURING A CONTINOUS WORK PERIOD.

FIELD CHANGE

THIS SHEET SUPPLEMENTS SHEET 88F1
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

SIGNATURE DATE

CAMBER TABLES
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TO-7C	OCT. 10, 2001	AS SHOWN

BARBARA THAYER, P.C.
320 WEST 42ND STREET
NEW YORK, NEW YORK

EARTH TECH

DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS
CHECKED BY: JV
ESTIMATED BY: FS CHECKED BY:
DESIGNED BY: GF, AS CHECKED BY: JV, FS
IN CHARGE OF: BT

SCHANDA
11/08/01
L:\WORK\46090\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\A2.DGN
L:_GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

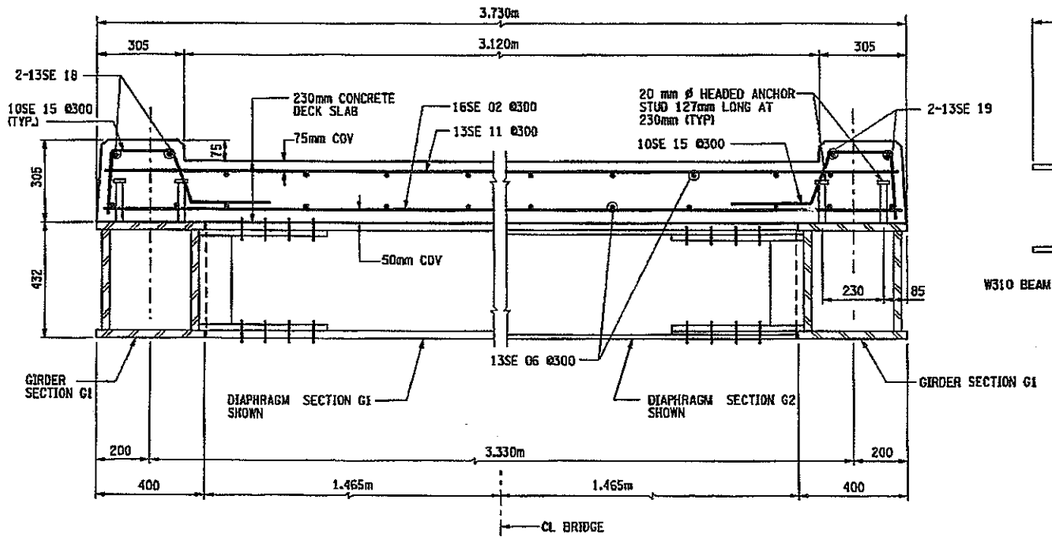
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	89	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

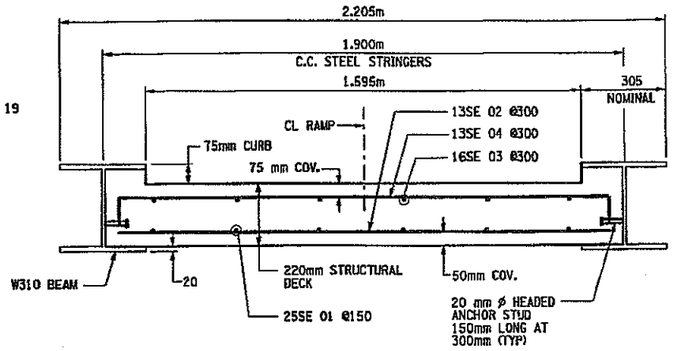
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



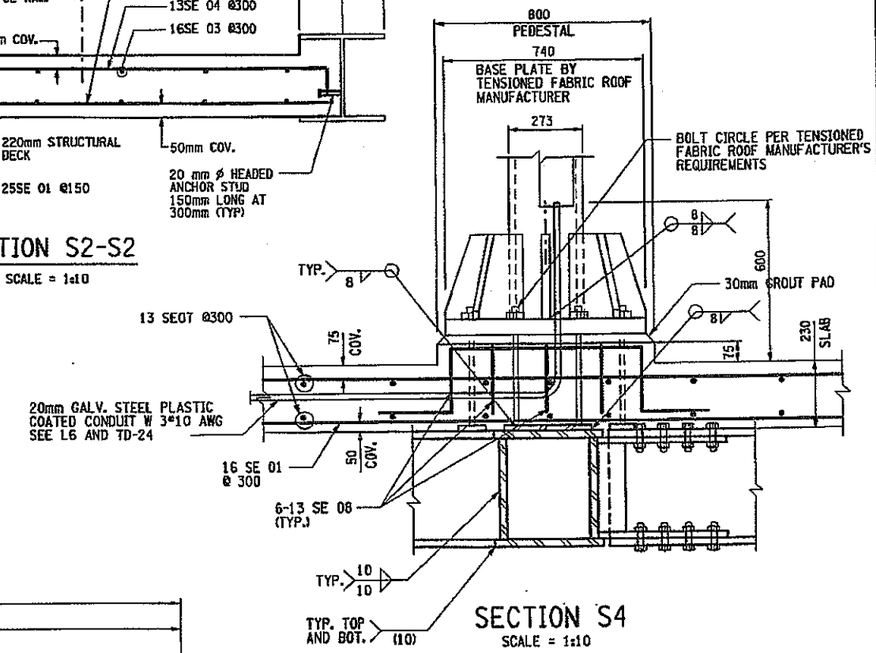
SECTION S1-S1

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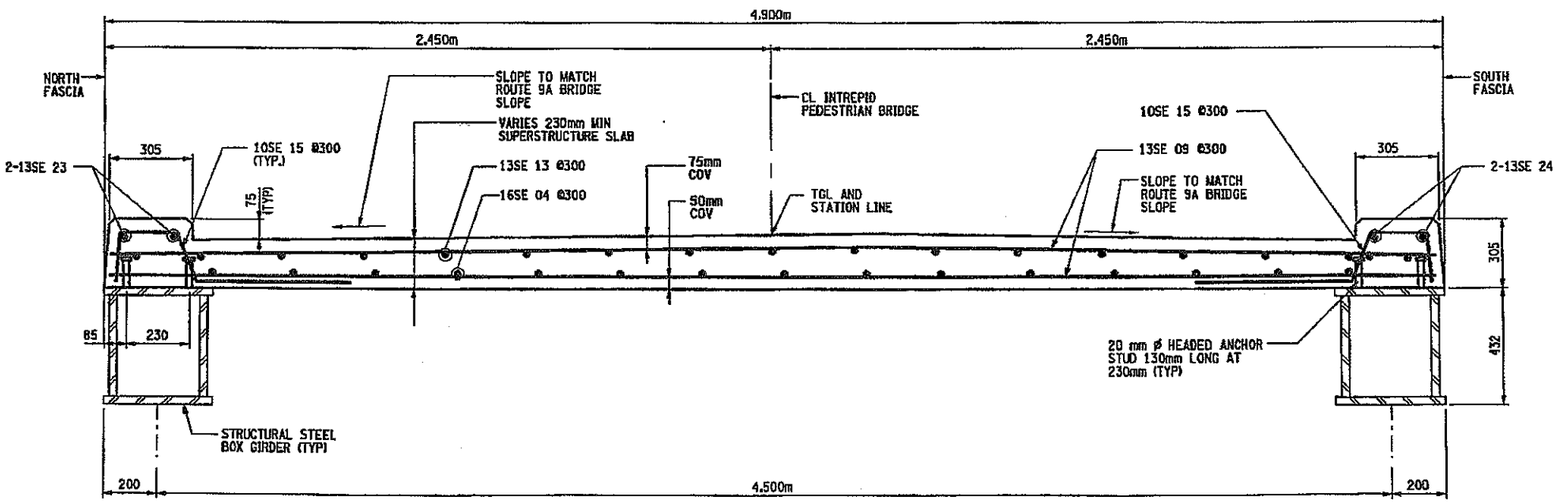
SECTION S2-S2

SCALE = 1:10



SECTION S4

SCALE = 1:10



SECTION S3-S3

SCALE = 1:10

NOTES:

1. STRUCTURAL STEEL SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 564.0504M
2. STUD SHEAR CONNECTORS SHALL BE PAID FOR UNDER ITEM 556.03M.
3. STRUCTURAL STEEL PAINTING SHALL BE PAID FOR UNDER ITEM 572.010001M, FEDERAL COLOR 36463
4. CONCRETE DECK SHALL BE PAID FOR UNDER ITEM 557.01M, SUPERSTRUCTURE SLAB WITH INTEGRAL WEARING SURFACE, BOTTOM FORMWORK REQUIRED. PAY ITEM INCLUDES EPOXY COATED REBAR
5. FOR TENSIONED FABRIC ROOF DETAILS, SEE DWG TD-24

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 1
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

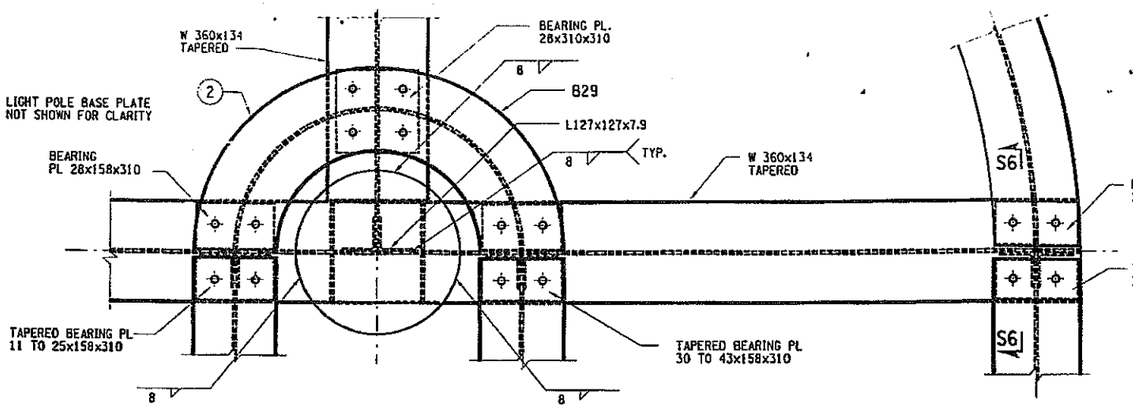
DWG. NO.	DATE	SCALE
TD-8	DEC. 2000	1 : 10

BARBARA THAYER, P.C.
500 WEST 43RD STREET
NEW YORK, NEW YORK

EARTH TECH

DESIGNED BY: GF, AS CHECKED BY: JV, FS DRAFTED BY: EL, RM, IV CHECKED BY: JV ESTIMATED BY: FS IN CHARGE OF: BT

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	90F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



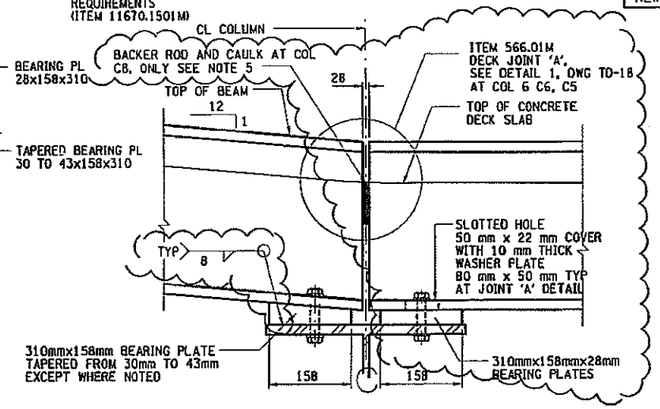
SECTION S15-S15

SCALE = 1:10

(1) 12mm x 276mm BENT WEB PLATE

(2) 19mm x 307mm CUT FLANGE PLATE

(3) THREADED STUD WELDED TO CAP PLATE PER LIGHT POLE MANUFACTURERS REQUIREMENTS (ITEM 11670.1501M)



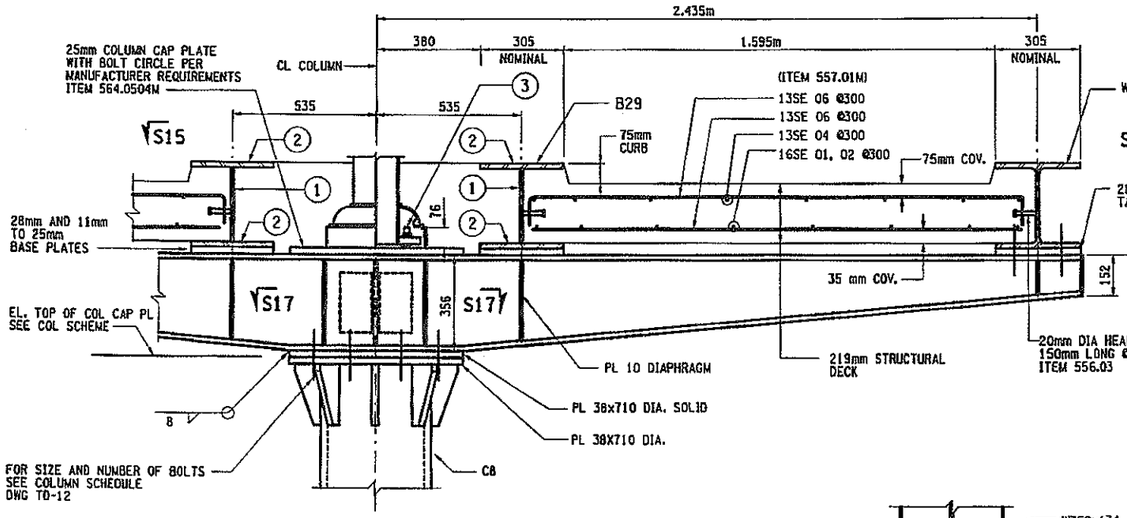
SECTION S6-S6

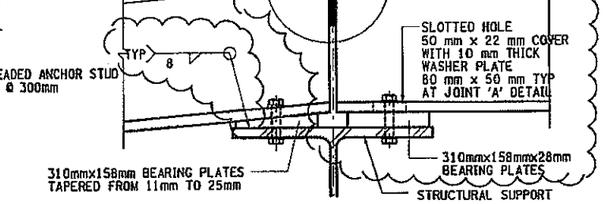
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CLOUDED AREA DENOTES CHANGES

FIELD CHANGE

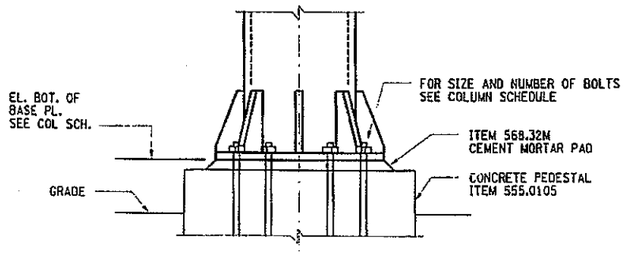
THIS SHEET SUPERSEDES SHEET 90
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES





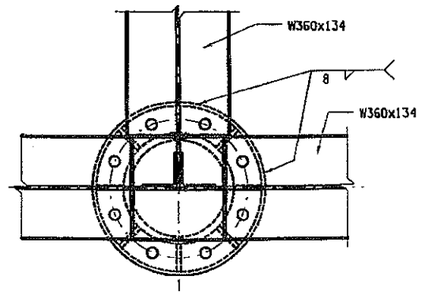
SECTION S7-S7

SCALE = 1:5



SECTION S10-S10

SCALE = 1:10



SECTION S17-S17

SCALE = 1:10

NOTES:

1. ALL WORK SHOWN ON THIS DRAWING EXCEPT LIGHT POLE SHALL BE PAID FOR UNDER ITEM 564.0504M, STRUCTURAL STEEL, TYPE 4, U.O.N.
2. FOR COLUMN CAP DETAILS SEE COLUMN SCHEDULE DWG TD-12
3. CONCRETE DECK SHALL BE PAID UNDER ITEM 557.01M, SUPERSTRUCTURE SLAB
4. ALL WELDS TO BE 6mm FILLET, UNLESS OTHERWISE NOTED
5. CAULK SHALL CONFORM TO SECTION 705.03. THE COST FOR INSTALLING BACKER ROD AND CAULK SHALL BE INCLUDED IN ITEM 557.01M

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 2
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
320 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE	
TD-9	OCT. 10, 2001	AS SHOWN	LARTH TECH

DESIGNED BY: OF, AS
DRAFTED BY: EL, RM, JV
CHECKED BY: JV
ESTIMATED BY: FS
CHECKED BY: JV, FS
IN CHARGE OF: BT

SCHAUDA
11/08/01
E:\WORK\48090\CADD\FIELD CHANGE SHEETS\FIELDCHANGE-OCTOBER 15-18 2001\X02422CA.P3A
E:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT
X02422CA.P3A

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	91	142

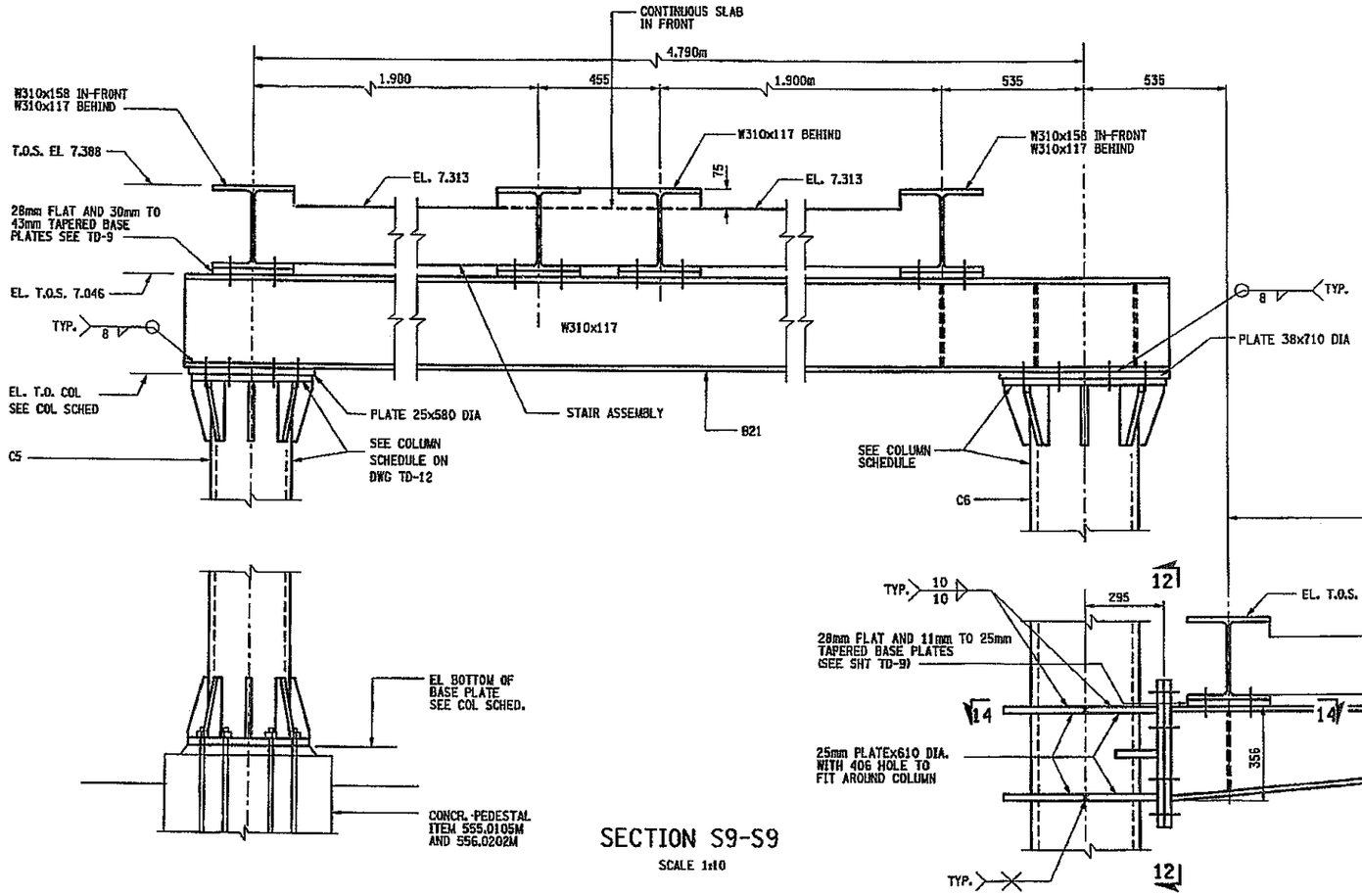
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

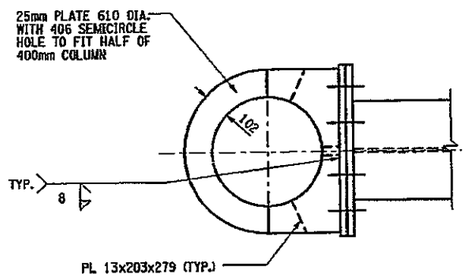
BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

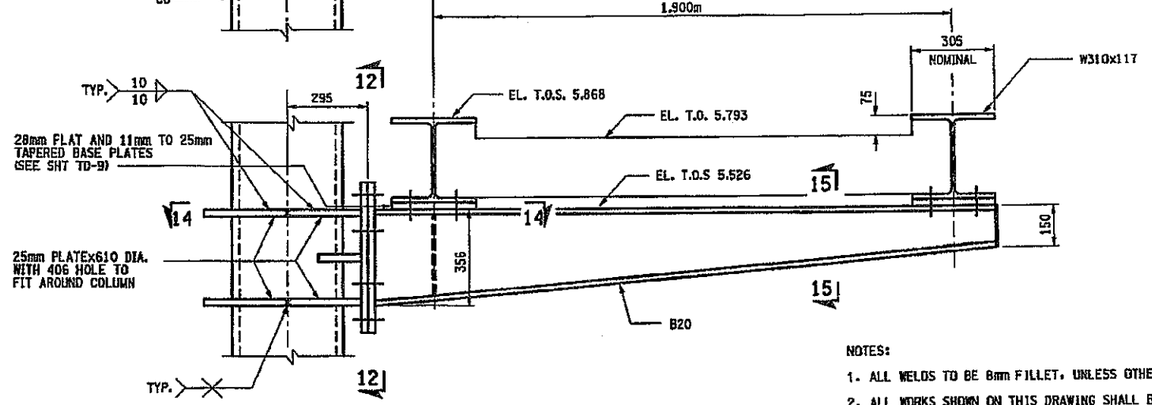
DESIGNED BY: CF, AS CHECKED BY: JV
DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS
ESTIMATED BY: FS CHECKED BY: JV, FS
IN CHARGE OF: BT

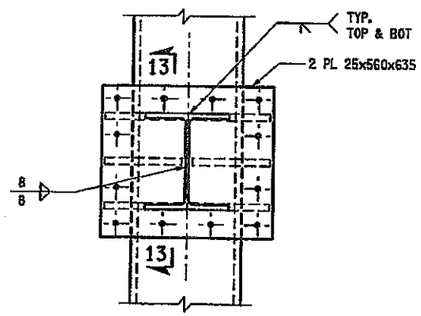


SECTION S9-S9
SCALE 1:10

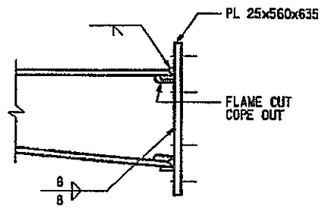


SECTION 14-14
SCALE 1:10

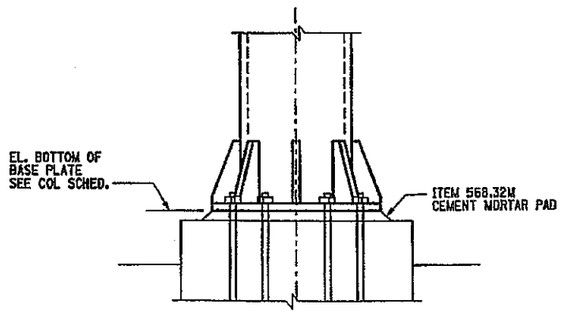


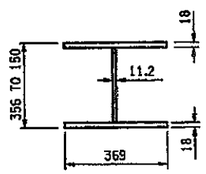


SECTION 12-12
SCALE 1:10



SECTION 13-13
SCALE 1:10





SECTION 15-15
SCALE 1:10

NOTES:

1. ALL WELDS TO BE 8mm FILLET, UNLESS OTHERWISE NOTED
2. ALL WORKS SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING

   ITEM 564.0504M, STRUCTURAL STEEL, TYPE 4

   ITEM 572.010001M, STRUCTURAL STEEL PAINTING, FEDERAL COLOR 36463

   ITEM 557.01M, SUPERSTRUCTURE SLAB

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 3 EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE	
TD-10	DEC. 2000	1:10	EARTH TECH

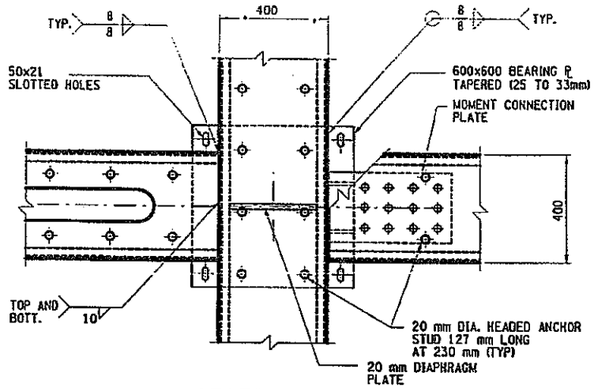
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	92F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

NOTES:

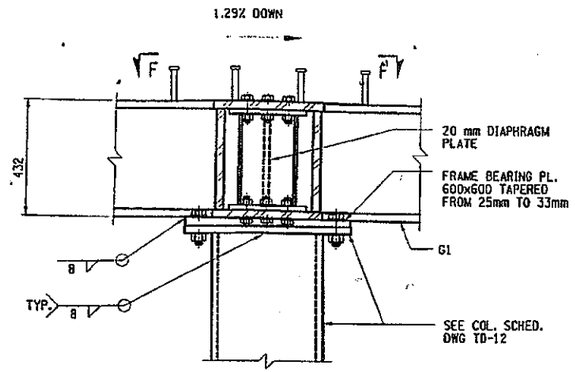
1. STRUCTURAL STEEL SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 564.0504M, INCLUDING WELDING, FASTENERS, PLATES AND STIFFENERS.
2. STRUCTURAL STEEL SHALL BE PAINTED UNDER ITEM 572.010001M.
3. CONCRETE DECK NOT SHOWN IN ALL SECTIONS FOR CLARITY.
4. ALL WELDS TO BE 8mm FILLET, UNLESS OTHERWISE NOTED.
5. FILL SPACE WITH TWO COMPONENT EPOXY.

FIELD CHANGE

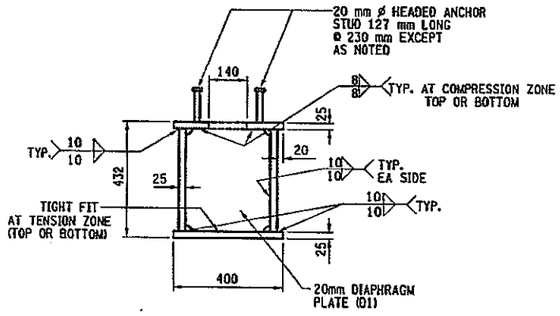
THIS SHEET SUPERSEDES SHEET 92 IN ITS ENTIRETY
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES



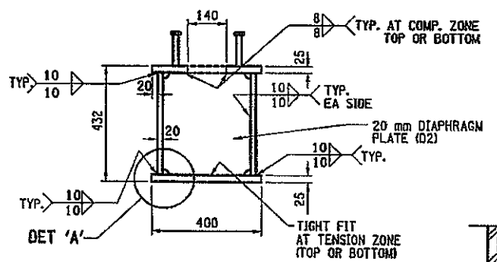
SECTION F-F



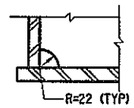
SECTION A-A



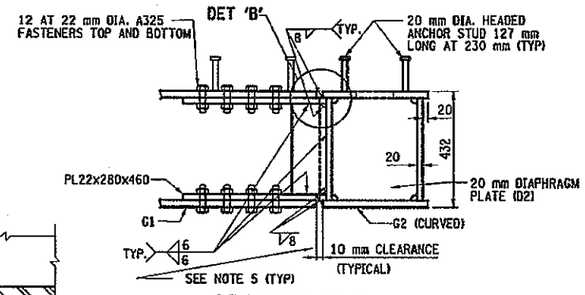
GIRDER SECTION G1



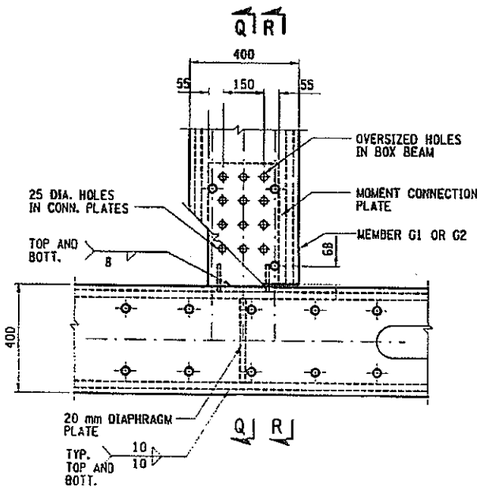
GIRDER SECTION G2



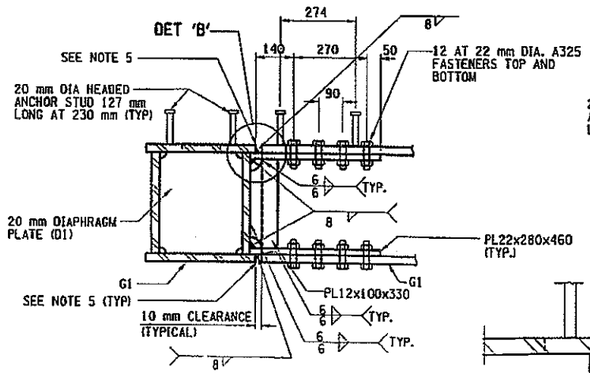
DETAIL 'A'
N.T.S



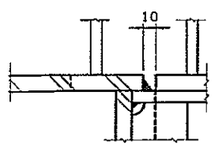
SECTION B-B



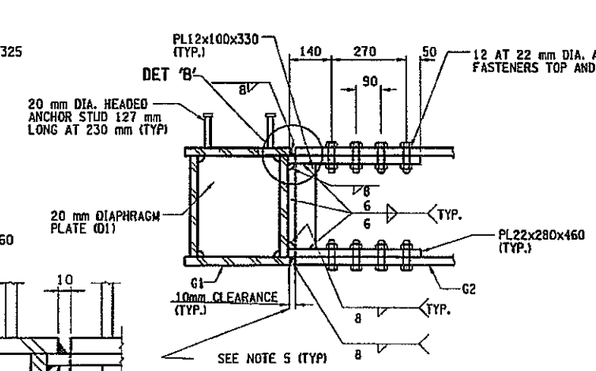
TYPICAL CONNECTION DETAIL



SECTION Q-Q



DETAIL 'B'
(TYPICAL FOR SECTIONS B-B, Q-Q, R-R)
TOP AND BOTTOM
N.T.S



SECTION R-R

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 4
EAST TOUCHDOWN (1 OF 2)

BARBARA THAYER, P.C.
330 WEST 42ND STREET NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-11	OCT. 10, 2001	1:10	EARTH TECH

ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS DESIGNED BY: GF, AS CHECKED BY: JV, FS IN CHARGE OF: BT

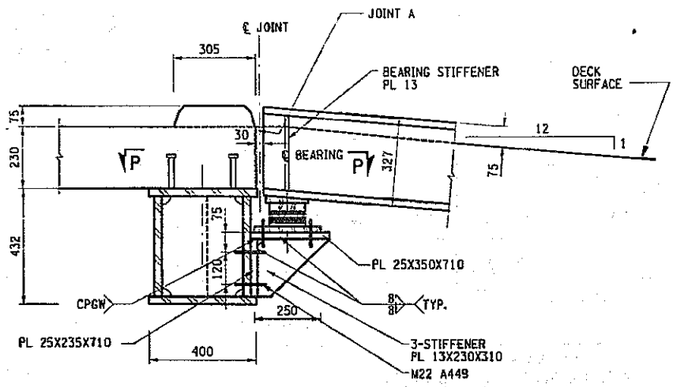
SCHAADA
E:\CAD\X02422CA\460R9A\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\OCTOBER 15-18 2001\X02422CA_P3C
L:\GENERAL\PLOTDRV\NYSDOT11X17.PLT

D258583

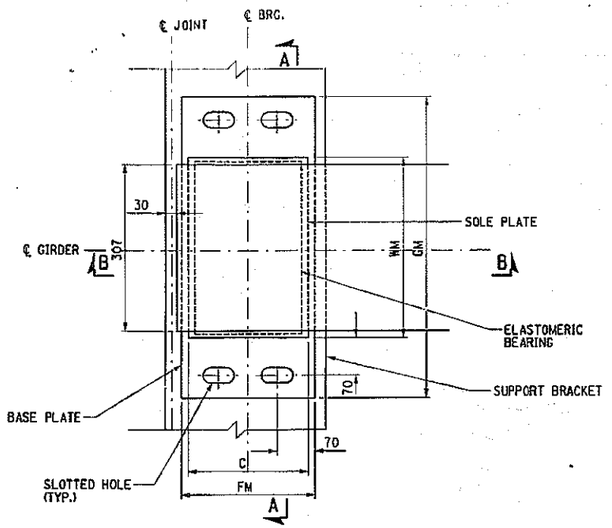
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	0258583	92F2	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

NOTES:

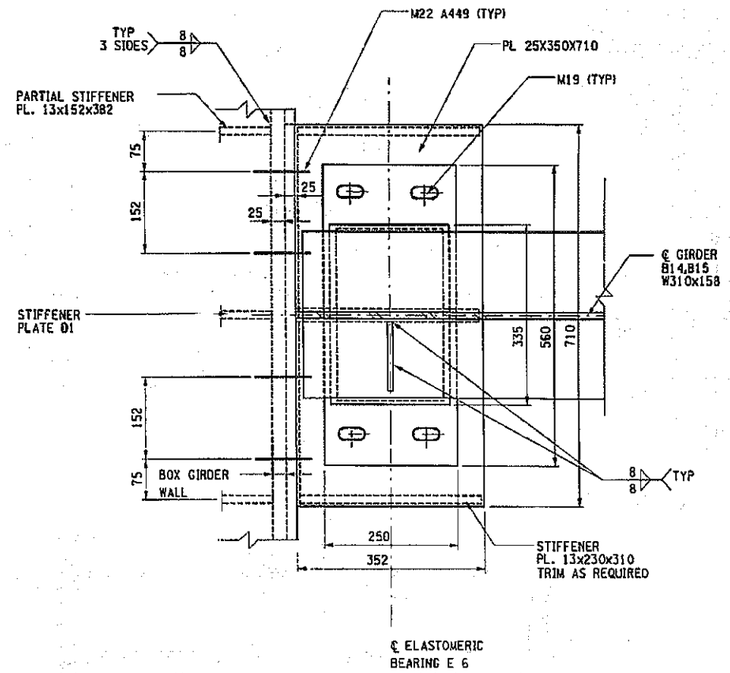
1. FOR ELASTOMERIC BEARING DETAILS SEE SHEET TD-19.
2. FOR SECTION C-C SEE SHEET TD-7.



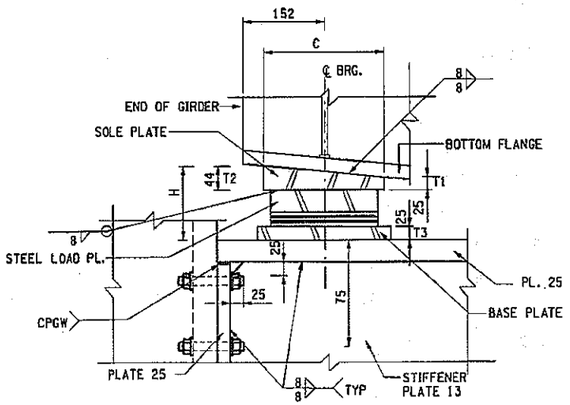
SECTION C-C
SCALE 1:10



PLAN
STEEL LAMINATED
ELASTOMERIC EXPANSION BEARING AT RAMP
SCALE 1:5



PLAN P-P
SCALE 1:5



SECTION AT RAMP
SCALE 1:5

FIELD CHANGE
THIS SHEET SUPPLEMENTS SHEET 92F1
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 4
EAST TOUCHDOWN (2 OF 2)

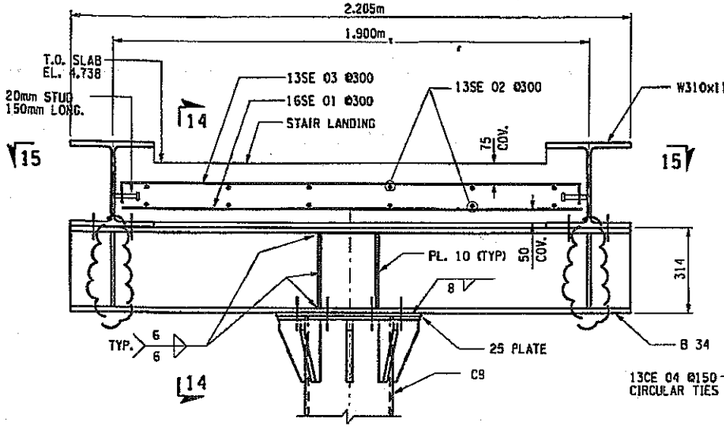
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-11A	OCT. 10, 2001	AS SHOWN

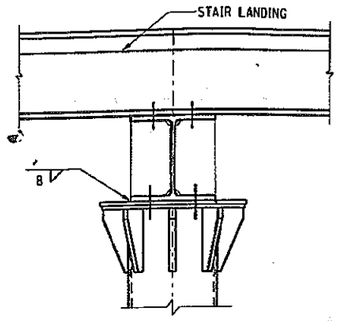
BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

LAFH TECH

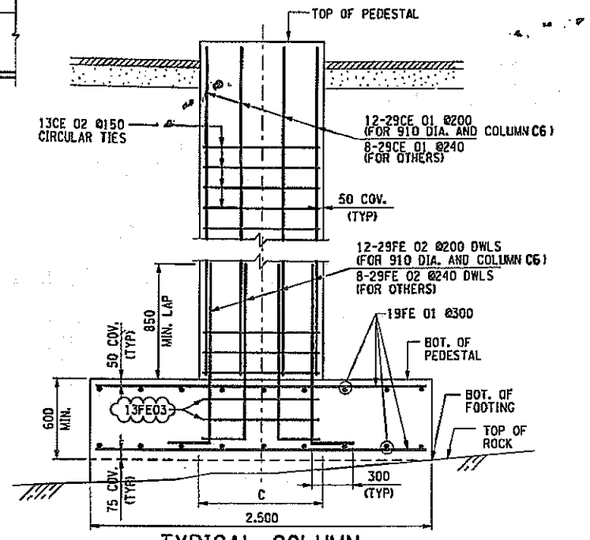
IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS ESTIMATED BY: FS
DRAFTED BY: EL, RM, JV CHECKED BY: JV
SCHEMA
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L:\...\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT



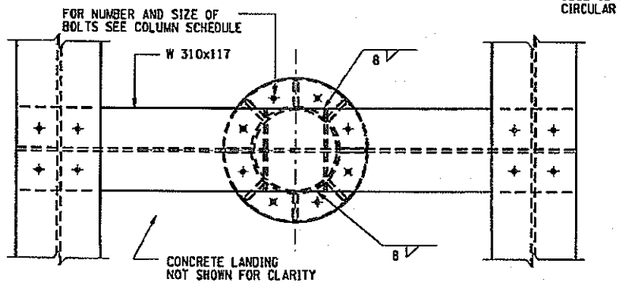
SECTION 13-13
SCALE 1:10



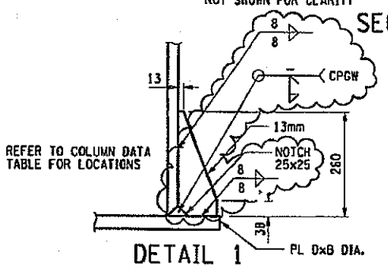
SECTION 14-14
SCALE 1:10



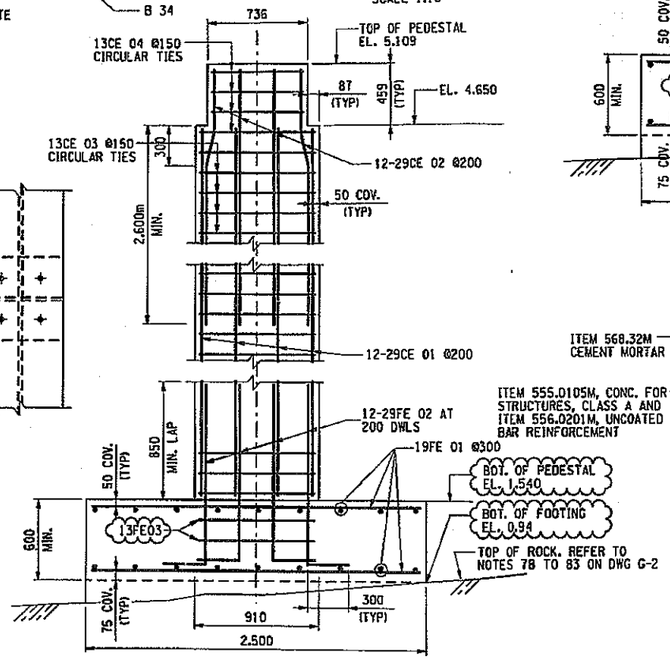
TYPICAL COLUMN PEDESTAL/FOOTING
SCALE 1:20



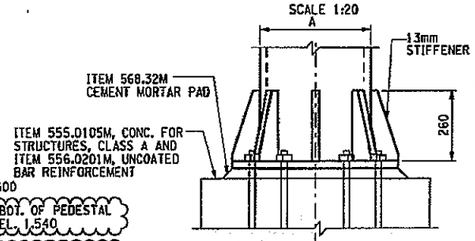
SECTION 15-15
SCALE 1:10



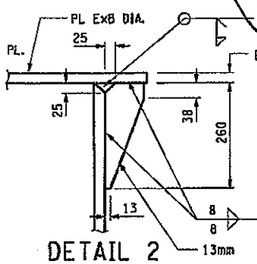
DETAIL 1
BASE STIFFENER
NOT TO SCALE



COLUMN C4 PEDESTAL/FOOTING
SCALE 1:20

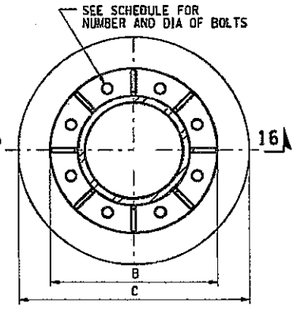


SECTION 16-16
SCALE 1:10



DETAIL 2
CAP STIFFENER
NOT TO SCALE

REFER TO COLUMN DATA TABLE FOR LOCATIONS



TYPICAL COLUMN DETAILS
SCALE 1:10

COLUMN DATA

MARK	(A) NOM. SIZE	O.D.	I.D.	EL BOT OF BASE PL.	EL TOP OF CAP PL.	(B) BASE PL DIA.	(D) BASE PL THICKNESS	BASE PL. BOLTS	CAP PL.	(E) CAP PL. THICKNESS	CAP PL. BOLTS	CAP PL. SHAPE	DETAIL NOTE 5	(C) CONCRETE PEDESTAL DIA.	ELEVATION TOP OF PED	ELEVATION BOT OF PED	ELEVATION B.O. FTG.
C1, C2	400	406	325	2.710	7.547	710	44	12@38	606x606	25	4@32	RECTANGLE	1, SEC A-A	910	2.630	1.177	0.600, 1.020
C3, C4	400	406	325	5.149	7.382	710	44	12@38	606x606	25	4@32	RECTANGLE	1, SEC A-A	910	5.109	1.540	0.940
C5	310	324	305	3.500	6.707	580	25	8@32	580	25	8@32	CIRCLE	1, 2	760	3.460	-0.200	0.630
C6	400	406	354	3.500	6.707	660	38	8@38	710	38	8@38	CIRCLE	1, 2	736	3.460	-0.200	0.880
C7	310	324	305	3.490	4.695	580	25	8@32	580	25	8@32	CIRCLE	1, 2	760	3.450	-0.250	0.850
C8	400	406	354	3.720	5.905	710	38	8@38	710	38	8@38	CIRCLE	1, 2	910	3.680	-0.050	-0.560
C9 *	310	324	305	2.020	4.160	580	25	8@32	580	25	8@32	CIRCLE	1, 2	* 760	2.050	-1.650	-0.700

* COLUMN C9 SHALL BE PAID FOR UNDER ITEM 564.0501 (WEST STAIR)

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	93F2	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22

FIELD CHANGE
THIS SHEET SUPERSEDES SHEET 93F1

THESE SIGNATURES APPROVE SHEETS 93F2, 93F3, 96F1, 97F1, 97F2, 97F3 AND 108F1.

APPROVED
DATE: Sept. 6, 2002
Jack J. Hartkorn
DEPUTY CHIEF ENGINEER (STRUCTURES)

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
APPROVED DATE: 9-9-02
JAMES F. FYNAN, P.E. ACTING IN HIS CAPACITY AS DEPUTY CHIEF ENGINEER (CONSTRUCTION)

REVISIONS ONLY
EARTH TECH
A TETRA TECH INTERNATIONAL LTD. COMPANY

CLOUDED AREA DENOTES CHANGES ON JANUARY 2002

CLOUDED AREA DENOTES CHANGES ON JULY 2002 BASED ON FIELD DATA

NOTES:

1. STRUCTURAL STEEL SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 564.0504M, INCLUDING WELDING, FASTENERS, PLATES AND STIFFENERS, EXCEPT THAT COLUMN C9, SHALL BE PAID FOR UNDER ITEM 564.0501 (WEST STAIR)
2. STRUCTURAL STEEL SHALL BE PAINTED UNDER PAY ITEM 572.010001M, FEDERAL COLOR 36463
3. COLUMNS SHALL BE A53 GRADE B OR A501 SEAMLESS OR ELECTRIC WELD (S OR E) MINIMUM YIELD OF 240 MPA
4. ALL WELDS TO BE 8mm FILLET, UNLESS OTHERWISE NOTED
5. FOR SECTION A-A SEE DWG TO-11. FOR DETAIL 1 AND 2 SEE THIS SHEET.

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS EAST TOUCHDOWN AND WEST STAIR

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

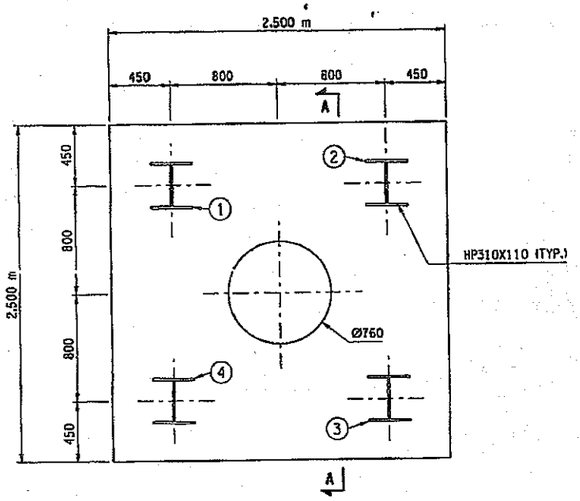
DWG. NO.	DATE	SCALE	
TO-12F2	JAN. 2002	AS SHOWN	EARTH TECH

BARBARA THAYER, P.C.
330 WEST 42ND STREET NEW YORK, NEW YORK

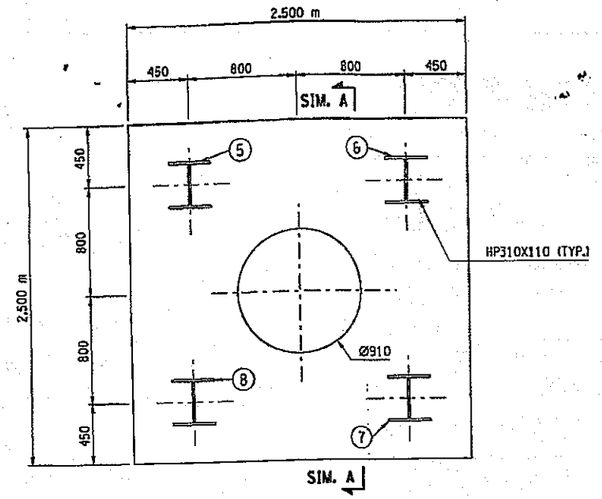
DESIGNED BY: GF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV CHECKED BY: JV
ESTIMATED BY: FS CHECKED BY: JV, FS
IN CHARGE OF: BT

M. YE
07/18/2002
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L:_GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

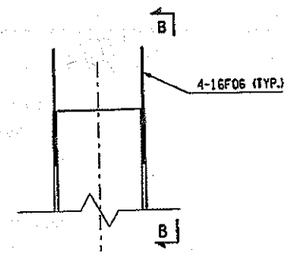
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	93F3	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



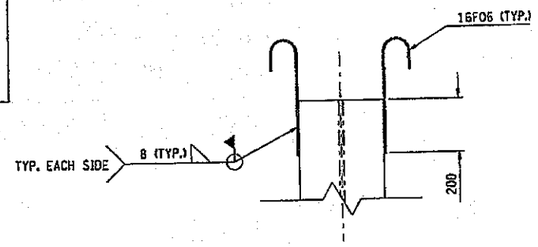
PLAN VIEW OF FOOTING FOR C7
SCALE 1:20



PLAN VIEW OF FOOTING FOR C8
SCALE 1:20



DETAIL 1
SCALE 1:10

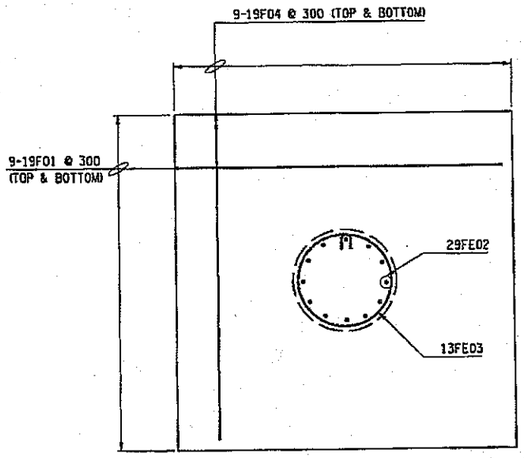


SECTION B-B
SCALE 1:10

PILE LENGTHS	
PILE NO.	LENGTH (M)
1	XX
2	XX
3	XX
4	XX
5	XX
6	XX
7	XX
8	XX

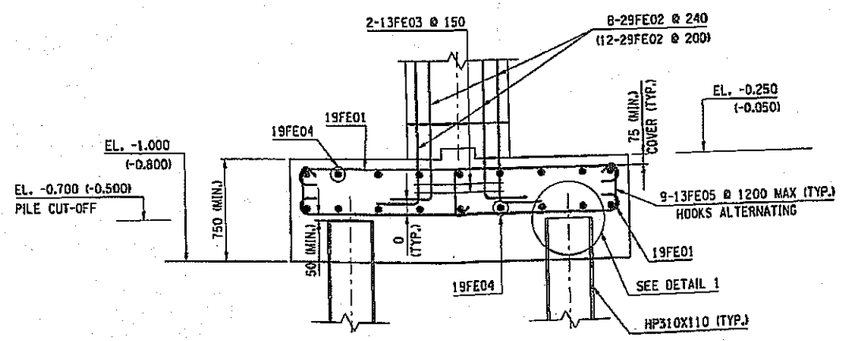
NOTES

1. FOR PILE INSTALLATION AND PROCEDURES REFER TO GEOTECHNICAL ENGINEERING BUREAU
2. FOR PILE SPLICE AND SHOE DETAILS SEE SHEET 97F3



REINFORCEMENT PLAN OF FOOTING FOR C7 & C8
SCALE 1:20
COLUMN 7 SHOWN
COLUMN 8 SIMILAR

* FOR REMAINING COLUMN REINFORCEMENT SEE SHEET NO. 93



SECTION A-A
SCALE 1:20
INSIDE ( ) FOR C8

LEGEND:

(##) - PILE NUMBERS

FIELD CHANGE

THIS SHEET SUPPLEMENTS SHEET 93F2.
SEE SHEET 93F2 FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

SIGNATURE DATE

PILE LAYOUT PLAN AND REINFORCEMENT FOR C7 & C8

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

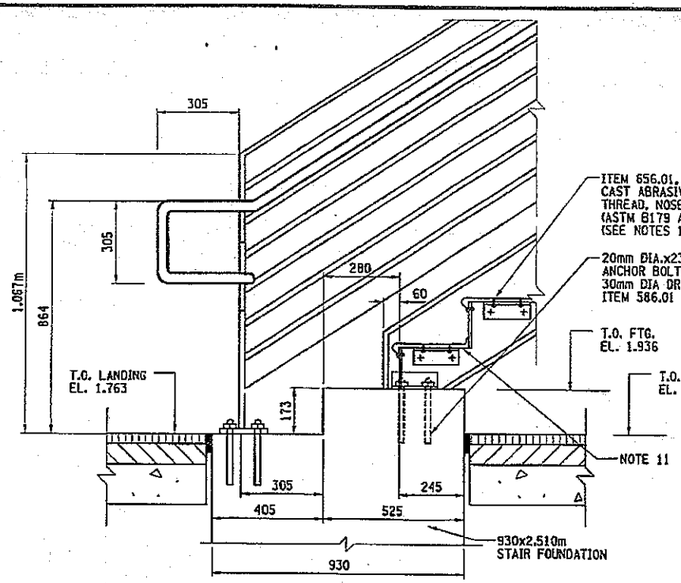
DWG. NO.	DATE	SCALE	
TD-12F3	JAN. 2002	AS NOTED	EARTH TECH

CHECKED BY:
DRAFTED BY:
CHECKED BY:
ESTIMATED BY:
CHECKED BY:
DESIGNED BY:
IN CHARGE OF:

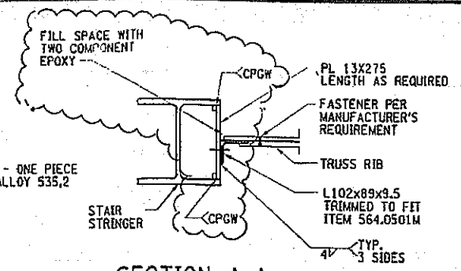
M_YE
07/17/2002
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L:\ CENTRAL\PLOTDRV\NYSDOT\NYSDOT11X17.PLT

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	94F1	142

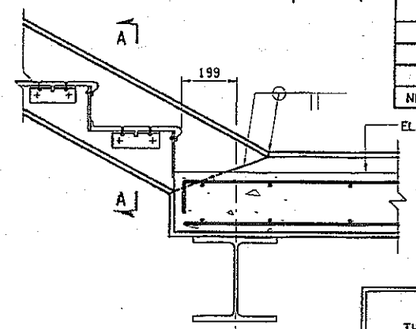
ROUTE 9A RECONSTRUCTION PROJECT,
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22



SECTION 21-21
SCALE 1:10

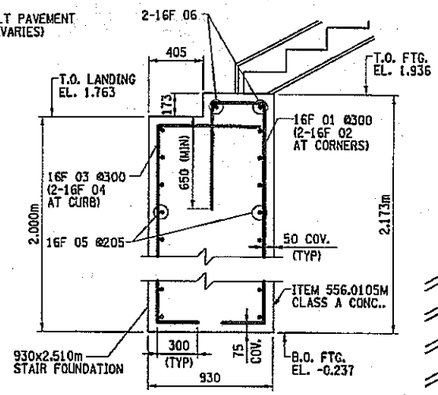


SECTION A-A

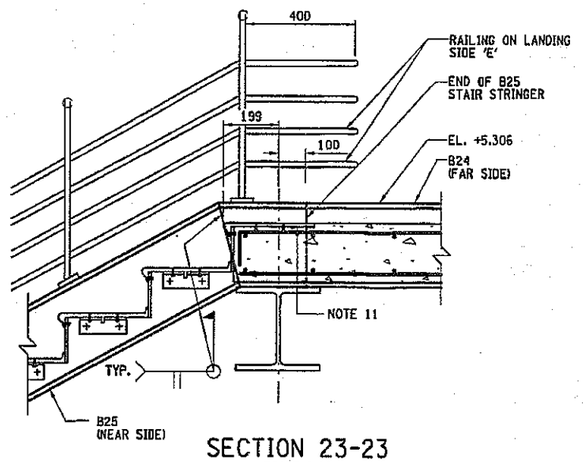


SECTION 24-24
SCALE 1:10

FIELD CHANGE
THIS SHEET SUPERSEDES SHEET 94
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

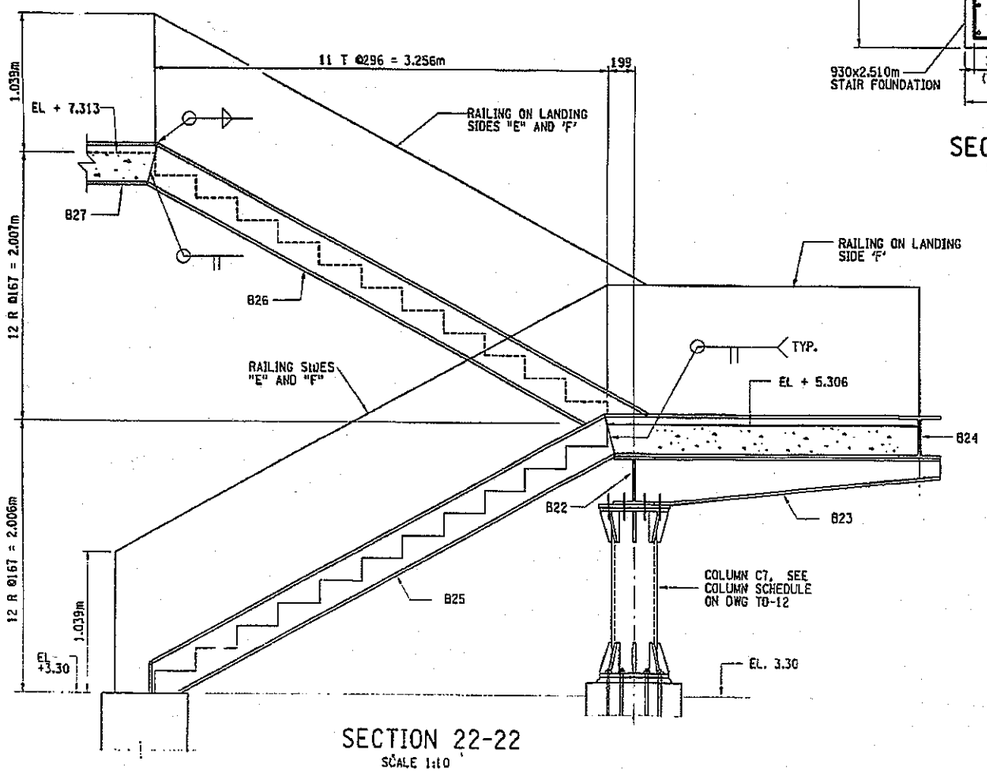


SECTION 9-9
SCALE 1:20



SECTION 23-23
SCALE 1:10

CLOUDED AREA DENOTES CHANGES



SECTION 22-22
SCALE 1:10

NOTES:

1. STAIR TREAD SHALL HAVE ANTI-SLIP SURFACE OF #24 VIRGIN GRAIN ALUMINUM OXIDE AND SILICON CARBIDE GRANULES INTEGRALLY CAST INTO WEARING SURFACE (0.6KG/M2), PAID FOR UNDER ITEM 656.01M
2. TREAD SHALL HAVE INTEGRAL 16mm THICK TRUSS RIB CAST INTEGRALLY AND CERTIFIED FOR 4.8 KPA LIVE LOAD
3. THREAD NOSE SHALL HAVE ADA SPECIFIED CONTOUR (13 RADIUS WITH 60 DEGREE MINIMUM TAPER)
4. STRUCTURAL STEEL SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 564.0504M, EAST TOUCH DOWN, AND 564.0501, WEST STAIR
5. STRUCTURAL STEEL SHALL BE PAINTED UNDER ITEM 572.010001M FEDERAL STANDARD COLOR 36463
6. STAIR THREADS SHALL BE PAID FOR UNDER ITEM 656.01, MISC. METALS
7. CONCRETE LANDINGS SHALL BE PAID FOR UNDER ITEM 557.01M, SUPERSTRUCTURE SLAB.
8. FOR DEVELOPED ELEVATIONS SEE DRAWING R-4
9. DECORATIVE RAILING SHALL BE PAID FOR UNDER ITEM 11615.8099M.
10. ALL WELDS TO BE 8mm FILLET, UNLESS OTHERWISE NOTED.
11. PROVIDE EPOXY PRIMER TO UNDERSIDE OF ALUMINUM TREADS IN CONTACT WITH STEEL ANGLE SUPPORTS AND CONCRETE LANDINGS PAID UNDER ITEM 656.01M

AS-BUILT REVISIONS

SIGNATURE DATE

SECTIONS AND DETAILS 6
ETD AND WEST STAIR

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-13	OCT. 10, 2001	AS SHOWN	LARTH TECH

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

ESTIMATED BY: FS CHECKED BY: JV
DESIGNED BY: CF, AS CHECKED BY: JV, FS
IN CHARGE OF: BT DRAFTED BY: EL, RM, JV

SCHANDA
PLOTTED: 10/18/2001 08:46
L:\WORK\460%\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\OCTOBER 15-18 2001\X024222CA.M3A
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

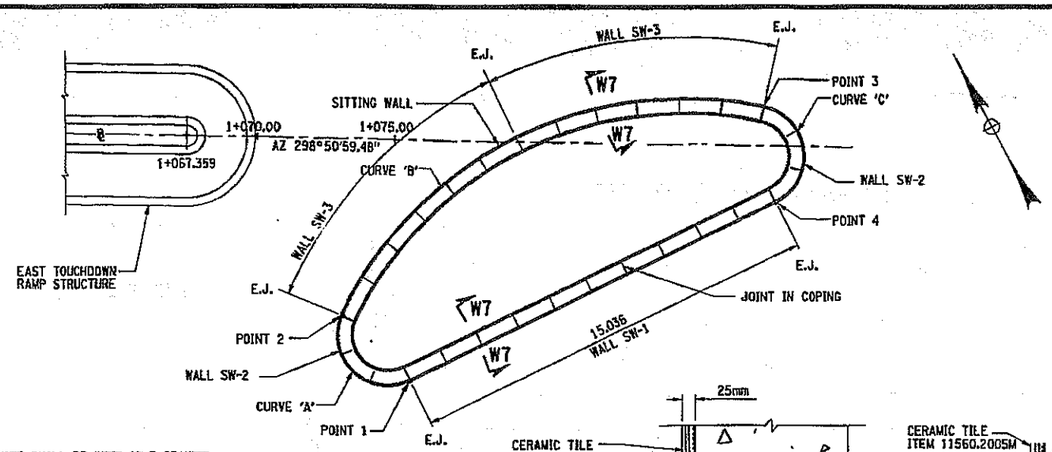
FED. RD. REG. ND.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	95	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

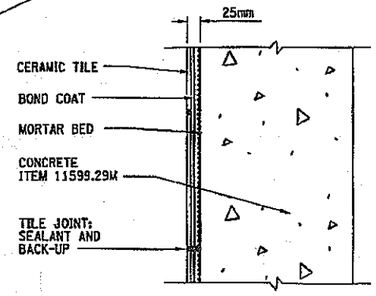
NEW YORK COUNTY PIN: X024.22



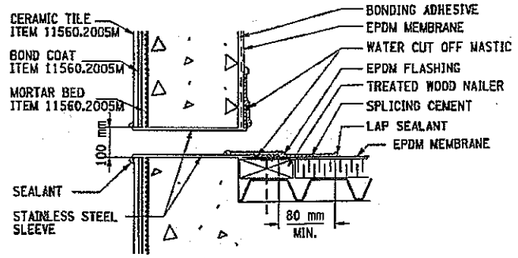
NOTES:

1. GRANITE SHALL BE DEER ISLE GRANITE WITH THERMAL FINISH. SECTIONS SHALL BE NO GREATER IN LENGTH THAN 1.524m NOR LESS THAN 1.000m
2. FOR SECTION W7-W7, SEE DWG. P-4

	POINTS	RADIUS m	STATIONS	OFFSET m
CURVE 'A'	P1	1.858	1+075.677	8.885 S
	P2		1+073.148	6.451 S
CURVE 'B'	P2	14.010	1+073.148	6.451 S
	P3		1+088.590	1.419 N
CURVE 'C'	P3	1.858	1+088.590	1.419 N
	P4		1+089.072	2.057 S



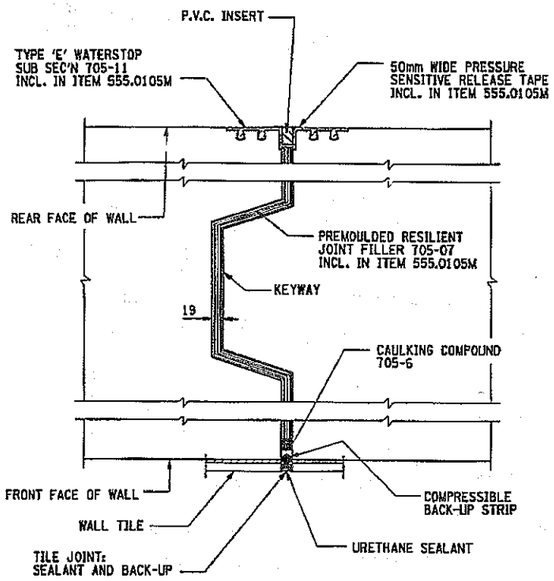
DETAIL 1
TYPICAL TILE JOINT 'D' DETAIL



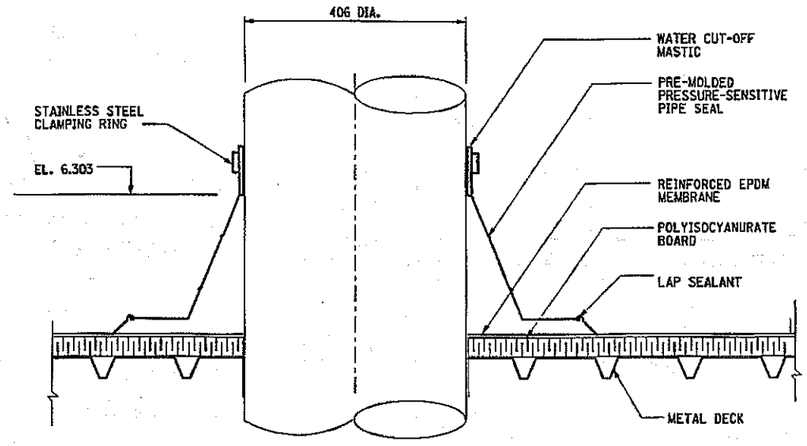
DETAIL 5
METAL SCUPPER AT DECK

NOTE:
1. ALL WORK SHOWN IN THIS DETAIL ITEM 11560.2005M UNLESS OTHERWISE NOTED
2. CERAMIC TILE COLOR TO MATCH FEDERAL STANDARD COLOR 27769

NOTE:
ALL WORK SHOWN IN THIS DETAIL ITEM 11599.29M UNLESS OTHERWISE NOTED

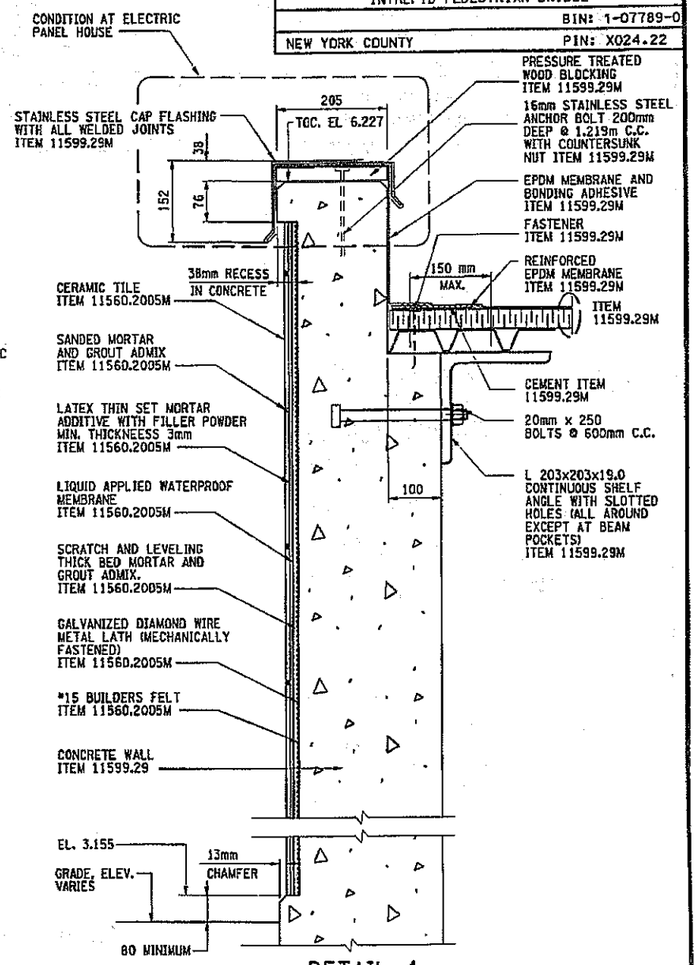


DETAIL 3
JOINT 'C' DETAIL



DETAIL 2
SECTION THRU PIPE PENETRATION

ALL WORK SHOWN IN THIS DETAIL ITEM 11599.29M



DETAIL 4
ELECTRIC PANEL HOUSE WALL SECTION

AS-BUILT REVISIONS

SIGNATURE DATE

MISCELLANEOUS DETAILS EAST TOUCHDOWN AND BUS LAYOVER AREA

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

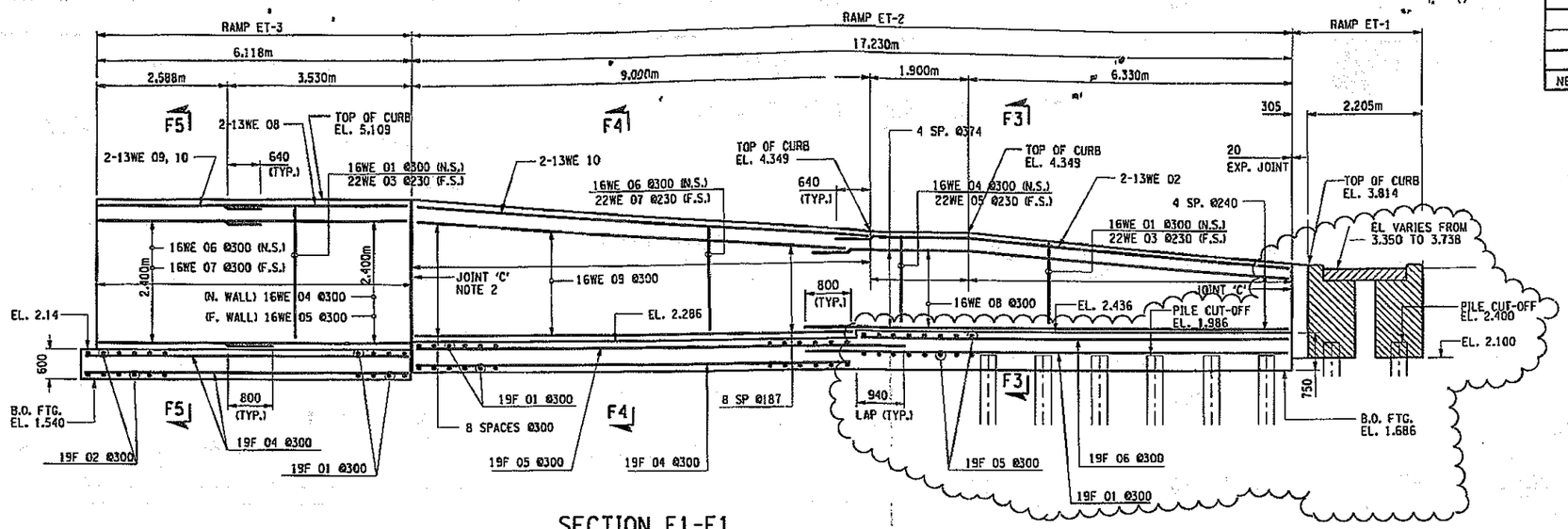
BARBARA THAYER, P.C.
220 WEST 42ND STREET
NEW YORK, NEW YORK

DWG. NO.	DATE	SCALE
TD-14	DEC. 2000	N.T.S.

EARTH TECH

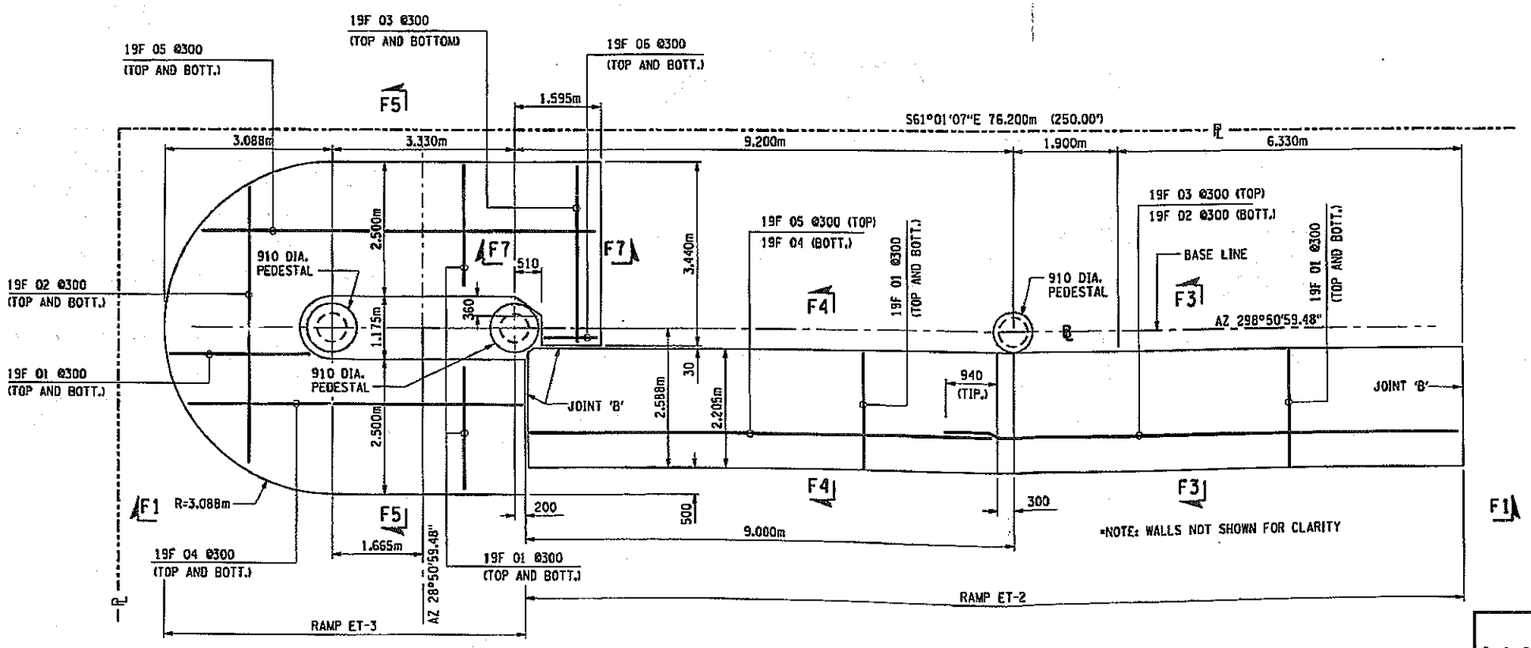
DRAFTED BY: EL, RM, JV CHECKED BY: JV
DESIGNED BY: GF, AS CHECKED BY: JV, FS
ESTIMATED BY: FS
IN CHARGE OF: BT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	96F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



SECTION F1-F1

SCALE = 1 : 50



FOUNDATION PLAN - RAMP ET-2 AND ET-3

SCALE = 1 : 50

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 96.
SEE SHEET 93F2 FOR APPROVAL SIGNATURES

NOTES:

1. WORK ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS EXCEPT AS NOTED:

   WALLS - ITEM 555.0105M, CLASS A GENERAL PURPOSE PORTLAND CEMENT CONCRETE.

   WALL REBAR - ITEM 556.0202M, EPOXY COATED BAR REINFORCEMENT FOR STRUCTURES.

   FOOTING CONCRETE - ITEM 555.0104M, FOOTING CONCRETE CLASS A

   FOOTING REBAR - ITEM 556.0201M, UNCOATED BAR REINFORCEMENT FOR STRUCTURES.

2. FOR JOINT 'C' SEE DWG. TD-14
3. FOR SECTIONS SEE DWG. TD-16F1, TD-16F2, TD-16F3 AND TD-17

AS-BUILT REVISIONS

SIGNATURE DATE

REVISIONS ONLY

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

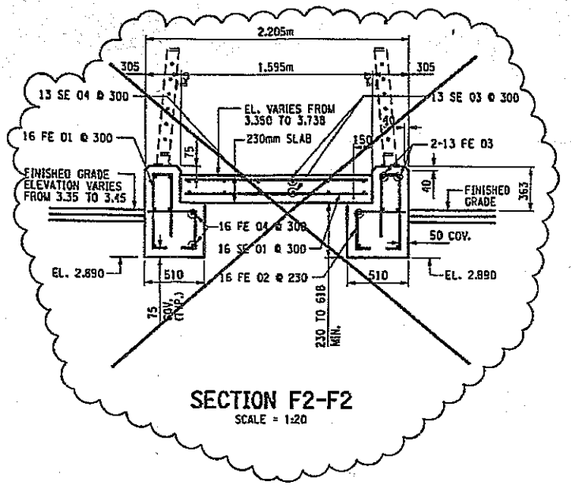
RAMP FOUNDATION PLAN, SECTION AND REINFORCEMENT - EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

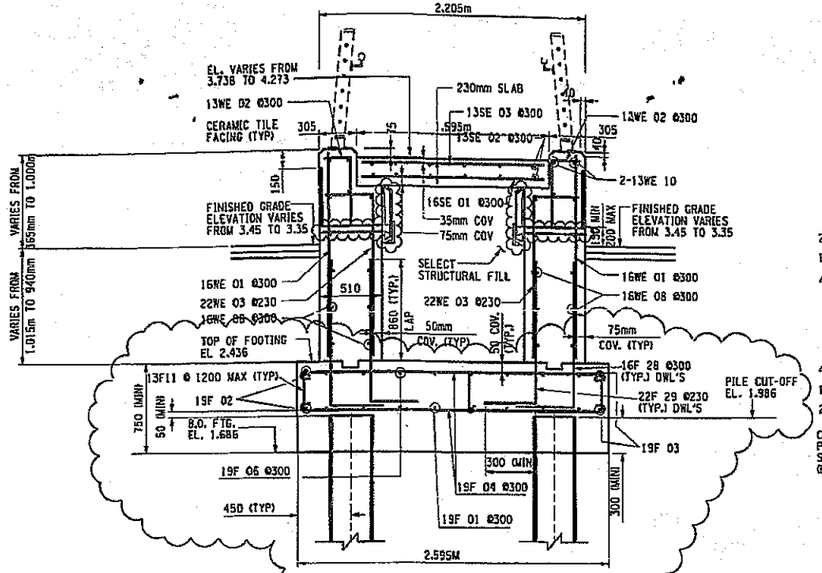
DWG. NO.	DATE	SCALE	
TD-15F1	JAN. 2002	AS SHOWN	EARTH TECH

M.VE
07/17/2002
L:\WORK\46090\CADD\FIELD CHANGE SHEETS\07-17-02\SECTREINF.DGN
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT
IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JW, FS
ESTIMATED BY: FS CHECKED BY: JW DRAFTED BY: EL, RM, IV CHECKED BY: JW, FS

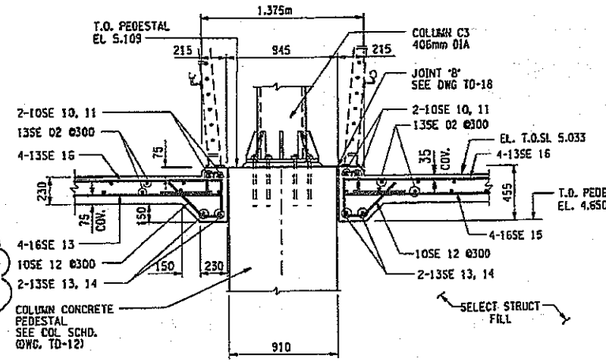
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	97F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	



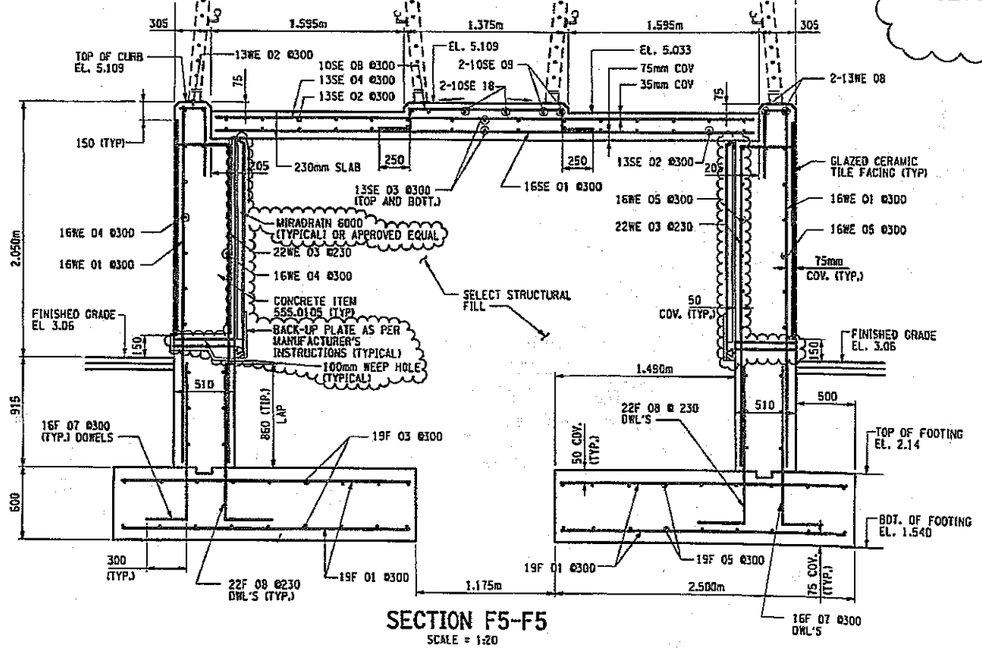
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SCALE = 1:20



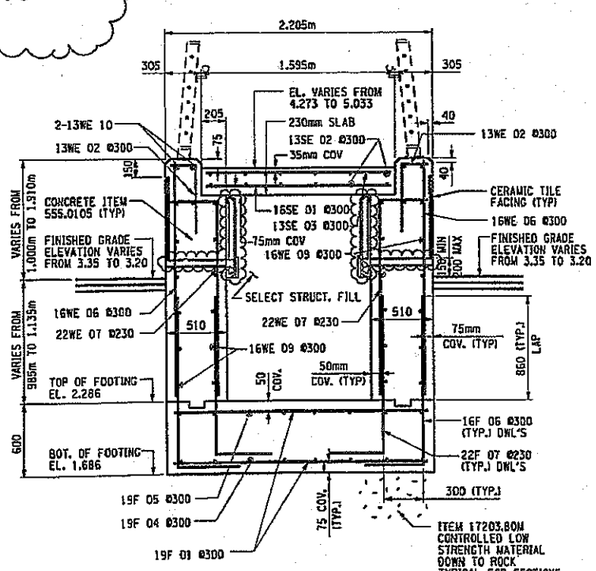
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SCALE = 1:20



SECTION F6-F6
SCALE = 1:20



SECTION F5-F5
SCALE = 1:20



SECTION F4-F4
SCALE = 1:20

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 97, SEE SHEET 93F2 FOR APPROVAL SIGNATURES

DENOTES REVISION

NOTES:

1. WORK ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS EXCEPT AS NOTED:

   WALLS- ITEM 555.0105M, CLASS A GENERAL PURPOSE PORTLAND CEMENT CONCRETE.

   DECK- ITEM 557.05M, STRUCTURAL SLAB WITH INTEGRAL WEARING SURFACE. BOTTOM FORMWORK NOT REQUIRED. PAY ITEM INCLUDES EPOXY COATED REBAR.

   BAR REINFORCING (WALLS)-ITEM 556.0202M, EPOXY COATED BAR REINFORCEMENT.
   BAR REINFORCEMENT (FOOTING)-ITEM 556.0202M, UNCOATED BAR REINFORCEMENT.

   FILL- ITEM 203.21M, SELECT STRUCTURAL FILL

   WALL TILE- ITEM 11560.91M, WALL TILES AND MORTAR BED

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

RAMP SECTIONS AND DETAILS EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-16F1	JAN. 2002		EARTH TECH

CHECKED BY: _____ DRAFTED BY: _____ CHECKED BY: _____ CHECKED BY: _____ ESTIMATED BY: _____ DESIGNED BY: _____ IN CHARGE OF: _____

PLOTTED: 8/28/2002
BY: L:\WORK\46849\CADD\FIELD CHANGE SHEETS\07-17-02\SECF3.DGN
L:\GENERAL\PLOTORY\NYS DOT-NYSDOT11X17.PLT

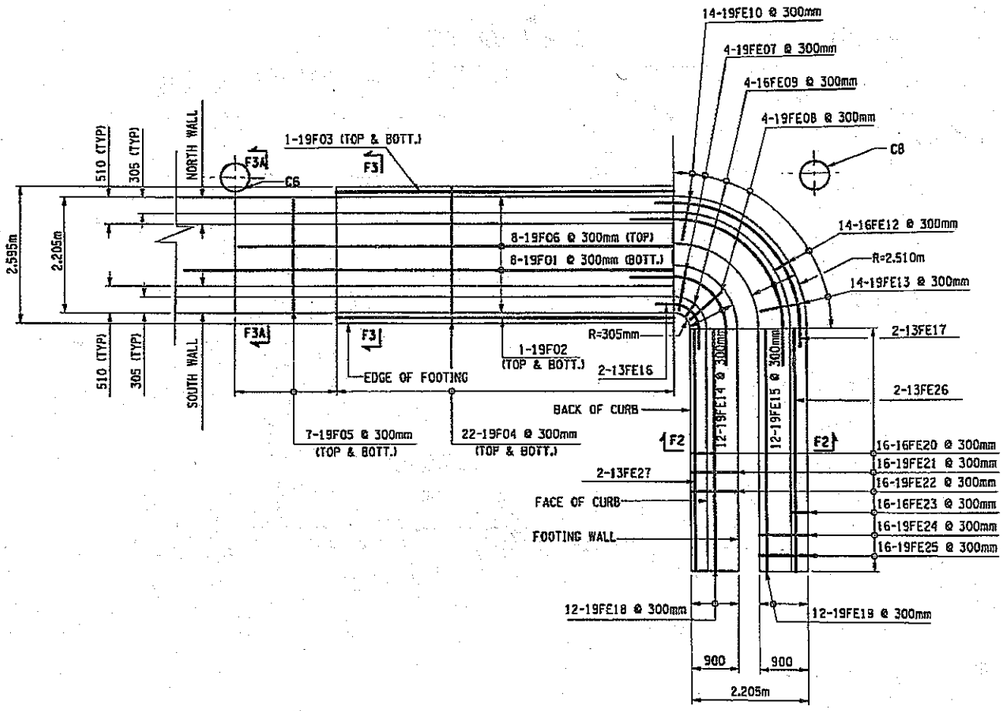
REG. NO.	STATE	PROJECT NO.	NO.	SHEETS
1	N.Y.	D258583	97F2	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

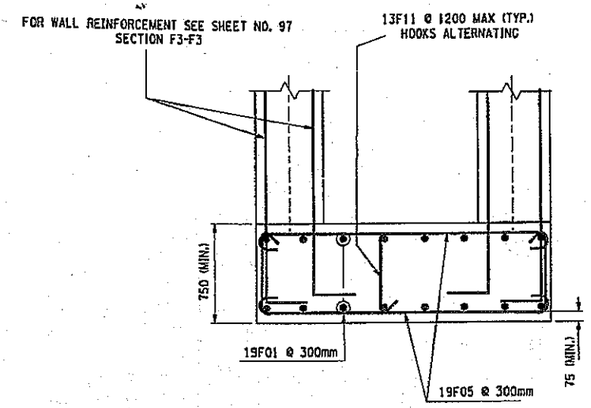
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NEW YORK COUNTY — PIN: X024.22



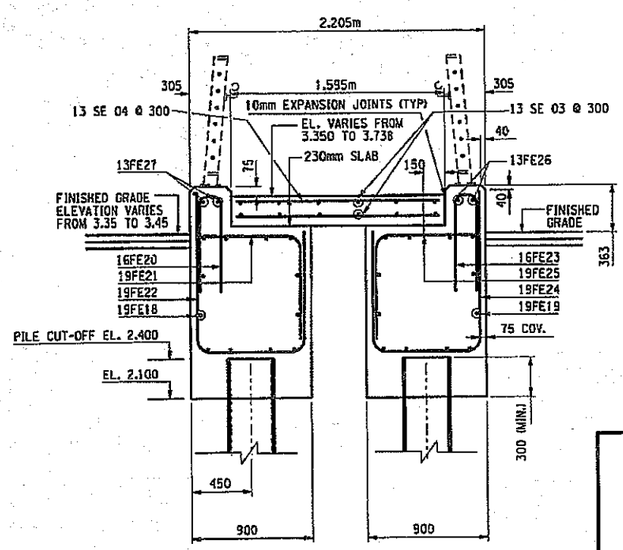
REINFORCEMENT PLAN OF ET-1 AND ET-2

SCALE = 1:50



SECTION F3A-F3A

SCALE = 1:20



SECTION F2-F2

SCALE = 1:20

LEGEND:

BOTT. - BOTTOM
CTR. - CENTER

NOTES:

1. FOR SECTION F3-F3, SEE SHEET 97F1.

FIELD CHANGE

THIS SHEET SUPPLEMENTS SHEET 97F1.
SEE SHEET 93F2 FOR APPROVAL SIGNATURES.

AS-BUILT REVISIONS

SIGNATURE DATE

RAMP PLAN AND SECTIONS

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-15F2	JAN. 2002		EARTH TECH

ESTIMATED BY: CHECKED BY: DRAFTED BY: CHECKED BY: DESIGNED BY: CHECKED BY:

IN CHARGE OF:

DATE 1/7/2002
D:\WORK\6888\CADD\FIELD CHANGE SHEETS\97-17-02\REINFORCEMENTPLAN.DGN
L:\GENERAL\PLOTDRV\NYSDOT11X17.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	101	142

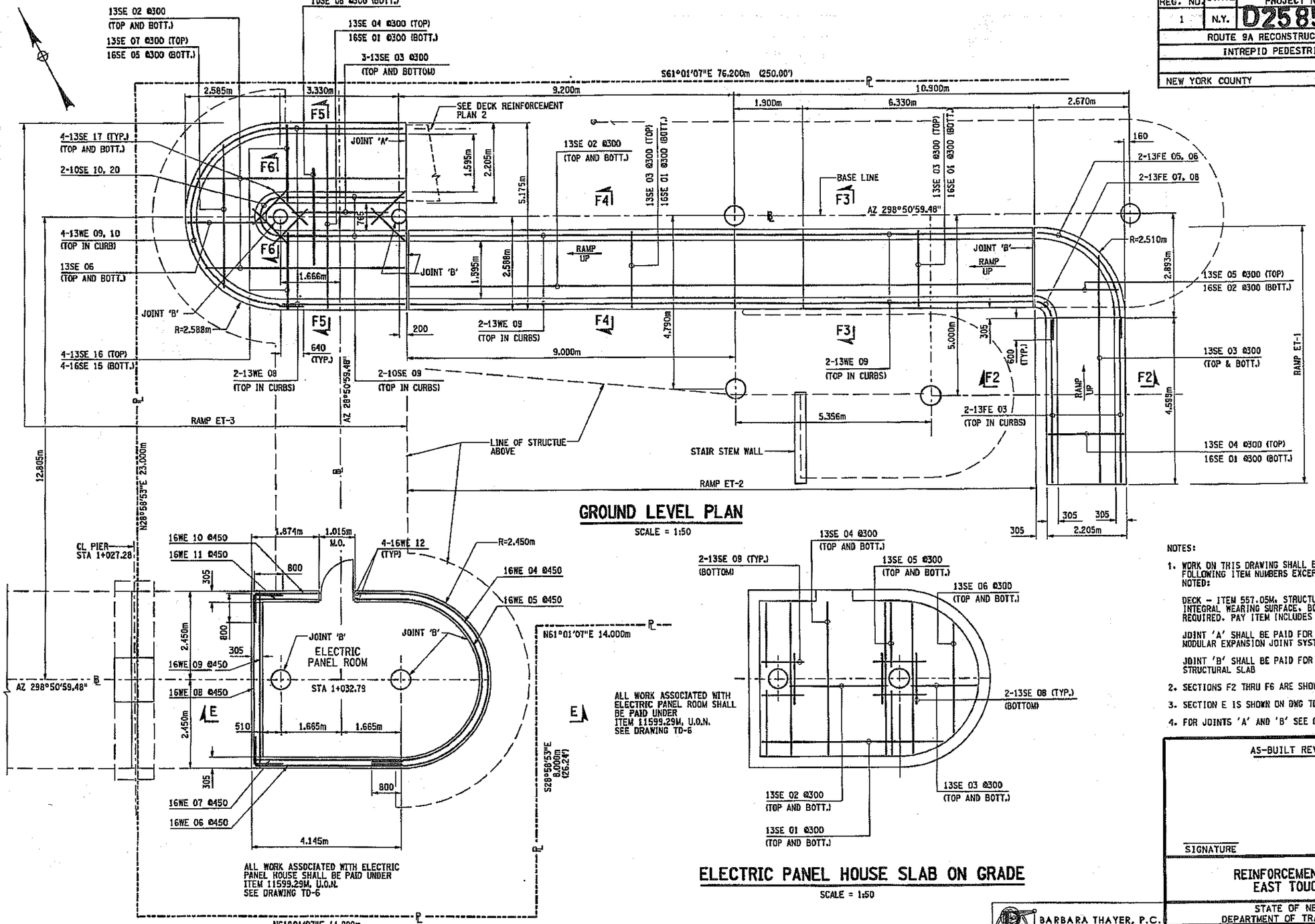
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

DESIGNED BY: GF, AS — CHECKED BY: JV, FS — DRAFTED BY: EL, RM, IV — CHECKED BY: JV — ESTIMATED BY: FS — CHECKED BY: JV, FS — IN CHARGE OF: BT



NOTES:

1. WORK ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS EXCEPT AS OTHERWISE NOTED:

   DECK – ITEM 557.05M, STRUCTURAL SLAB WITH INTEGRAL WEARING SURFACE. BOTTOM FORMWORK NOT REQUIRED. PAY ITEM INCLUDES EPOXY COATED REBAR.

   JOINT 'A' SHALL BE PAID FOR UNDER ITEM 566.01M, MODULAR EXPANSION JOINT SYSTEM – ONE CELL

   JOINT 'B' SHALL BE PAID FOR UNDER ITEM 557.05M, STRUCTURAL SLAB

2. SECTIONS F2 THRU F6 ARE SHOWN ON DWG TD-16
3. SECTION E IS SHOWN ON DWG TD-6
4. FOR JOINTS 'A' AND 'B' SEE DWG TD-18

AS-BUILT REVISIONS

SIGNATURE — DATE

REINFORCEMENT PLAN 1 EAST TOUCHDOWN

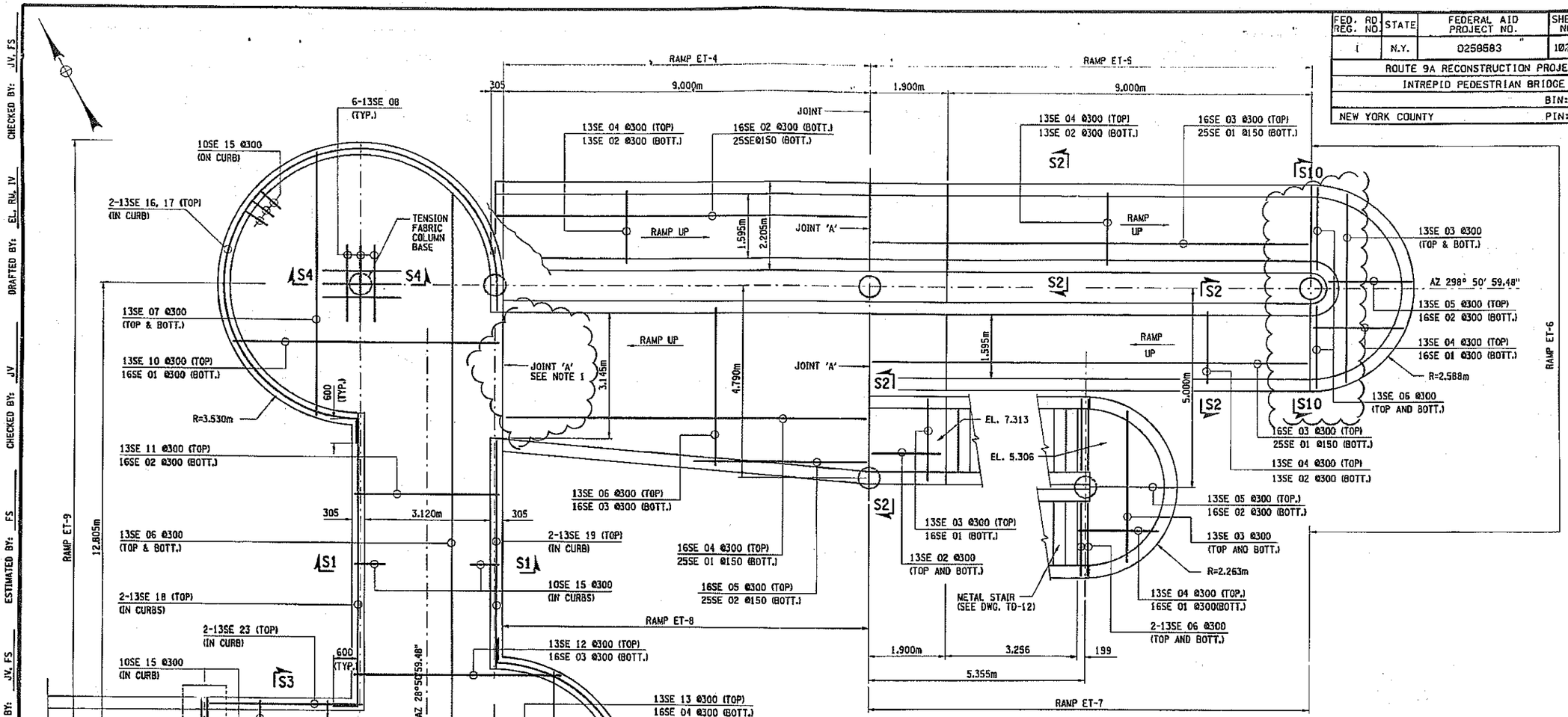
BARBARA THAYER, P.C.
250 WEST 49TH STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-20	DEC. 2000	1:50	EARTH TECH

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
I	N.Y.	0258583	10RF1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22



PLAN
SCALE = 1:50

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 102
SEE SHEET NO. 33F1 FOR APPROVAL SIGNATURES

CLOUDED AREA DENOTES CHANGES

NOTES:

1. WORK ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS EXCEPT AS OTHERWISE NOTED:

   DECK - ITEM 557.01N, SUPERSTRUCTURE SLAB WITH INTEGRAL WEARING SURFACE, BOTTOM FORMWORK REQUIRED. PAY ITEM INCLUDES EPOXY COATED REBAR.

   JOINT 'A' SHALL BE PAID FOR UNDER ITEM 566.01M, MODULAR EXPANSION JOINT SYSTEM - ONE CELL

2. FOR SECTIONS, SEE DWGS. TD-8 THRU TD-13

AS-BUILT REVISIONS

SIGNATURE DATE

REINFORCEMENT PLAN 2
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
TD-21	OCT. 10, 2001	1:50

BARBARA THAYER, P.C.
320 WEST 42ND STREET
NEW YORK, NEW YORK

LARFH TECH

DESIGNED BY: GF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, IV CHECKED BY: JV
ESTIMATED BY: FS CHECKED BY: JV, FS
IN CHARGE OF: BT

SCHAMBA
L:\X0242200\460900\CADD\FIELD CHANGE SHEETS\FIELDCHANGE\OCTOBER 15-18 2001\X02422CA.S3B
L:\X0242200\460900\CADD\GENERAL\PLOTDRV\NYSDOT\NYSDOT11X17.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	103A	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

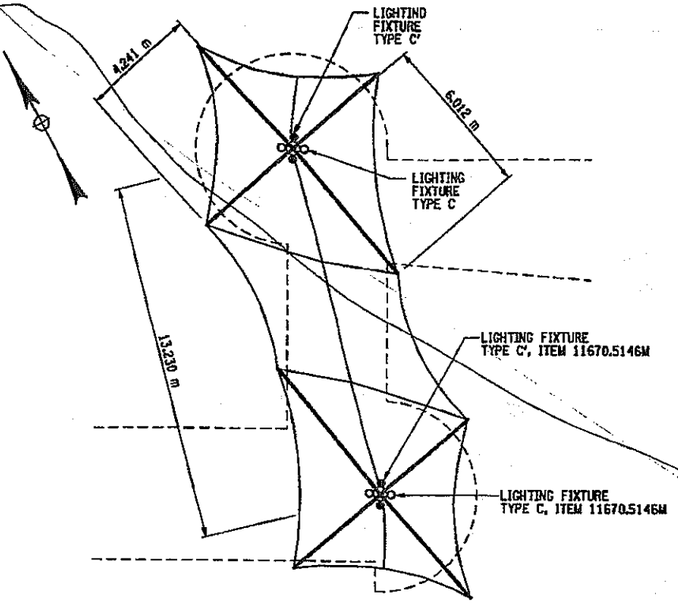
NEW YORK COUNTY PIN: X024.22

DESIGNED BY: GF, AS CHECKED BY: JV, FS

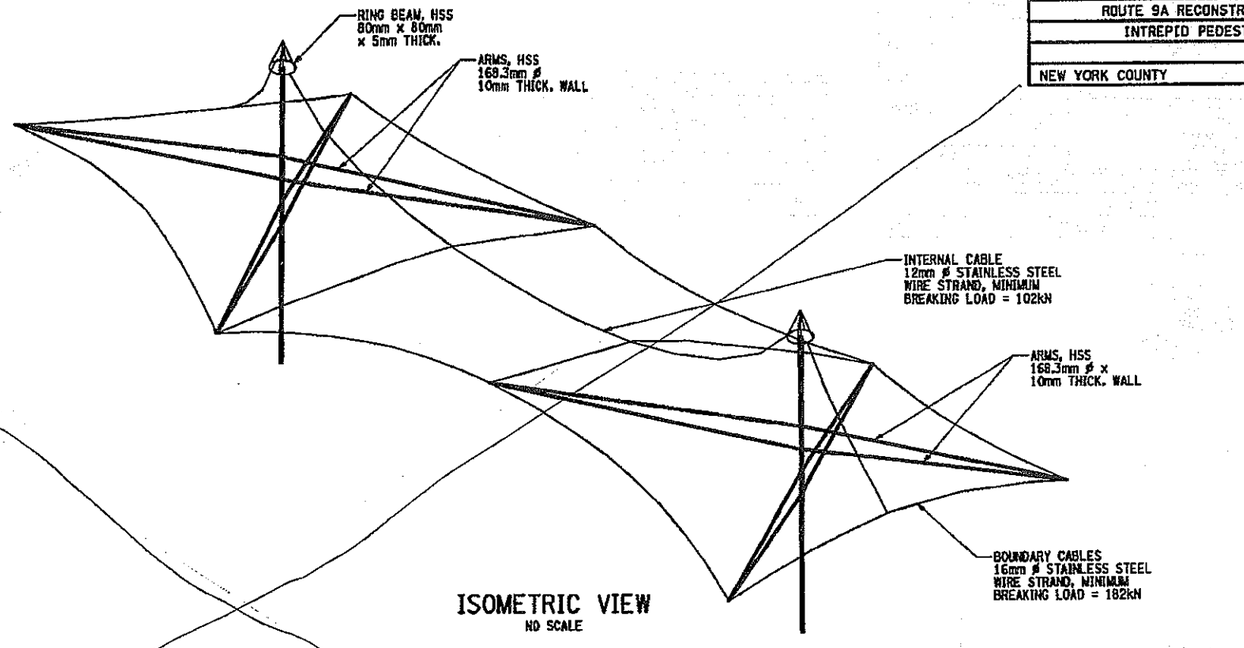
DRAFTED BY: EL, RM, IV CHECKED BY: JV

ESTIMATED BY: FS CHECKED BY: FS

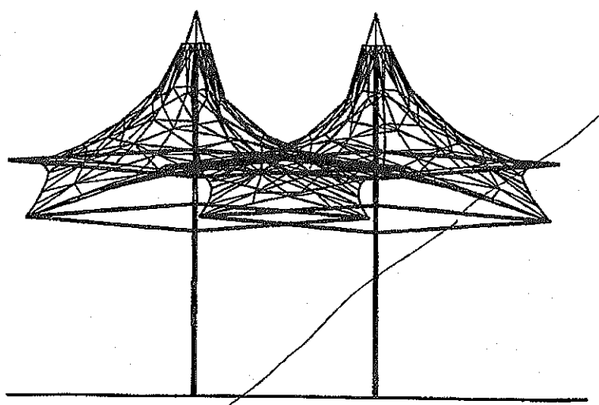
IN CHARGE OF: BT



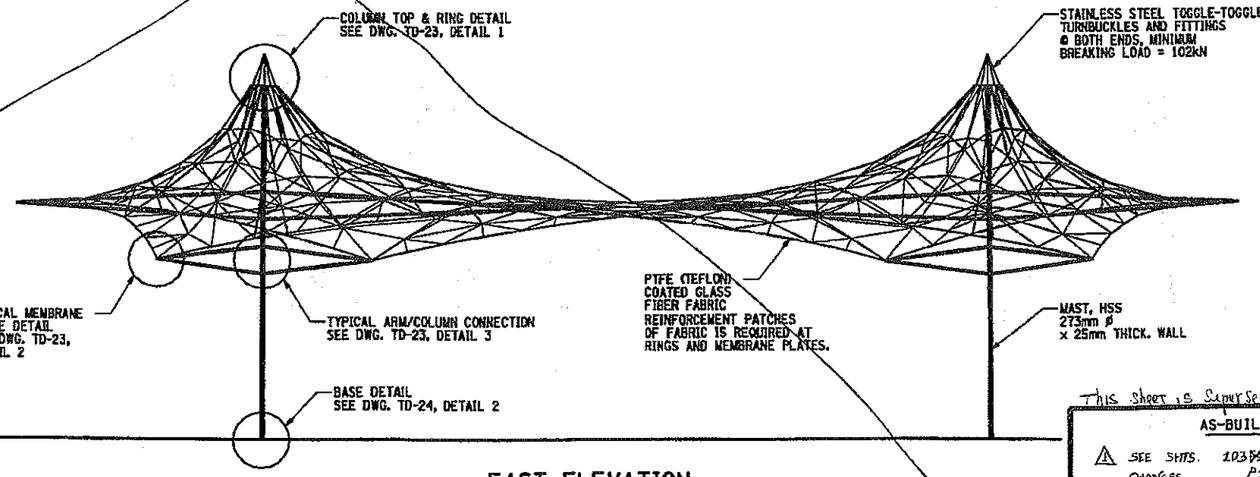
PLAN
SCALE: 1:100



ISOMETRIC VIEW
NO SCALE



SOUTH ELEVATION
SCALE: 1:50



EAST ELEVATION
SCALE: 1:50

NOTES:

1. THIS DRAWING SHOWS DESIGN INTENT ONLY FOR THE FABRIC STRUCTURE.
2. ALL STEEL SECTIONS TO BE 36 KSI UNLESS OTHERWISE NOTED.
3. ALL PINS & PLATES TO BE 50 KSI UNLESS OTHERWISE NOTED.
4. ALL BOLTS AND SCREWS TO BE GRADE 8.8 UNLESS OTHERWISE NOTED.
5. ALL TURNBUCKLES, SHACKLES, CABLES & END FITTINGS TO BE STAINLESS STEEL & SHALL CONFORM TO MINIMUM BREAKING LOADS WHERE INDICATED. SUITABLE NYLON WASHERS, SLEEVES ETC. SHALL BE PROVIDED AT LOCATIONS WHERE ISOLATION BETWEEN STEEL & STAINLESS STEEL IS REQUIRED.
6. THE CONTRACTOR SHALL RETAIN THE SERVICES OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER TO PREPARE STRUCTURAL CALCULATIONS FOR THE TENSILE STRUCTURE FOR SUBMISSION & APPROVAL, WHICH SHALL BE SIGNED AND STAMPED. STRUCTURAL DESIGN SHALL INCLUDE ARCHITECTURAL FORM, LOAD ANALYSIS AND PATTERNING USING A LARGE DEFLECTION FINITE ELEMENT COMPUTER PROGRAM, MEMBER SIZING AND CONNECTION DESIGN CALCULATIONS (INCLUDING BOLT, WELD AND SECONDARY MEMBER SIZING). LOADING INFORMATION PROVIDED BY THE CONTRACTOR'S ENGINEER SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE CODES AND REGULATIONS.
7. ALL WELDS TO BE 8mm FILLET UNLESS OTHERWISE NOTED.
8. ALL WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 11634.9901M UNLESS OTHERWISE NOTED.

This sheet is superseded by sheets 103RR1 & 103RR2

AS-BUILT REVISIONS

⚠1 SEE SHTS. 103RR1 & 103RR2 FOR CHANGES FOR FOR

SIGNATURE DATE 5/16/04

TENSIONED FABRIC ROOF DETAILS - 1

BARBARA THAYER, P.C.
880 WEST 42ND STREET
NEW YORK, NEW YORK

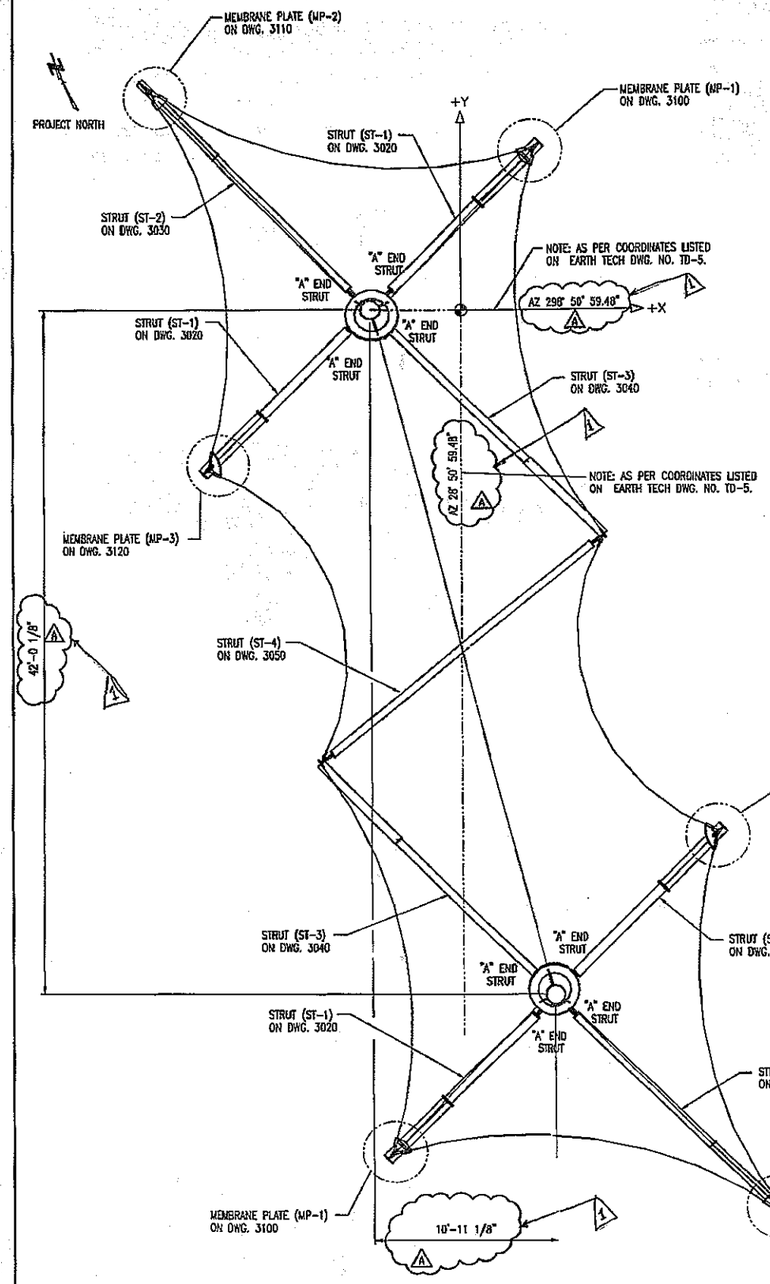
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

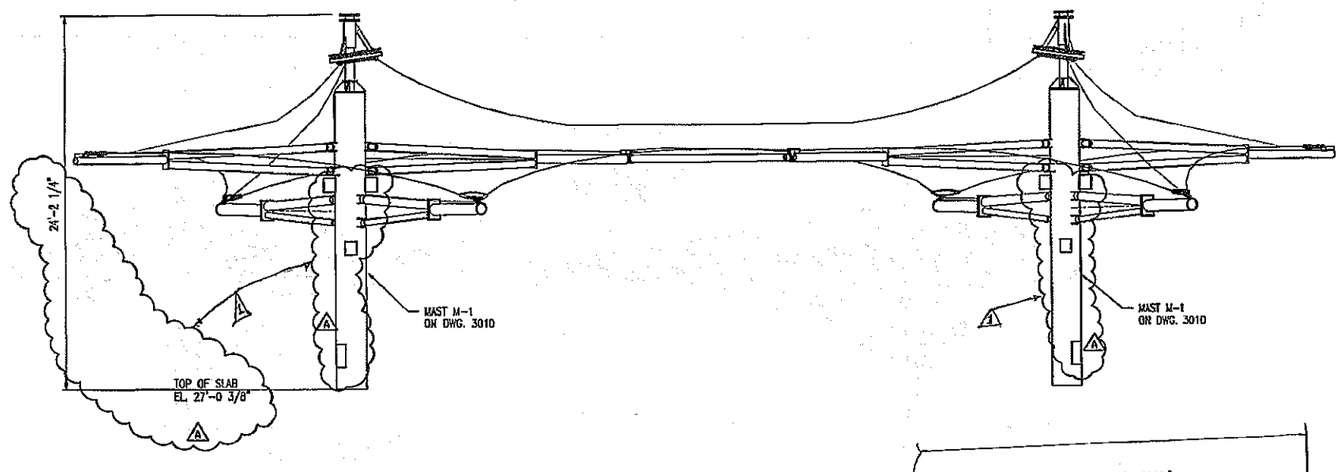
DWG. NO.	DATE	SCALE	
TD-22	DEC. 2000	AS NOTED	EARTH TECH

103 R2

D258533 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
W. 49TH ST. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET 103 R2 OF 142





AS-BUILT REVISION

⚠ CLOUDED AREA DENOTES CHANGES
SEE SHT 103 R2

SIGNATURE

4/24/04
DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH — Engineers Approved New York, New York 10016

Engineer's review and approval of this submittal are expressly limited to conformity with the Contract Documents and are only to determine compliance with information given in the Contract Documents and conformance with the design concept of the Project as a functioning whole. The Contractor is responsible for dimensions that shall be confirmed and correlated at the job site; for fabrication, shipping, handling, storage, assembly, installation and construction; and for all safety aspects of performing the Work and for coordinating the Work.

APPROVED	X
APPROVED AS NOTED	
REVISE AND RESUBMIT	
NOT APPROVED	
Date ____ By ____	

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	10-3-02	JAC	MI	MI

REVISIONS

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	NAME	DATE
DRAWN BY	JAC	7-30-02
CHECKED BY	MI	7-30-02
ENGINEER	MI	7-30-02
FINAL REVIEW		
SCALE	AS NOTED	

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9850

TITLE
STEEL
DETAIL LOCATION PLAN
INTREPID PEDESTRIAN BRIDGE

DWG. NO. 02020 D 3001

REV A

103 R3

STEEL SPECIFICATIONS

1.0 GENERAL

1.1 ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING AMERICAN STANDARD SPECIFICATIONS AND CODES WITH MODIFICATIONS AS SPECIFIED HEREIN:

AMERICAN INSTITUTE OF STEEL CONSTRUCTION – "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."

AMERICAN INSTITUTE OF STEEL CONSTRUCTION – "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."

AMERICAN INSTITUTE OF STEEL CONSTRUCTION – "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS."

AMERICAN WELDING SOCIETY – "STRUCTURAL WELDING CODE" AWS D1.1.

AMERICAN SOCIETY FOR TESTING AND MATERIALS – AS REFERENCED HEREIN.

NYS STEEL CONSTRUCTION MANUAL (A)

1.2 IN THE EVENT OF CONFLICT BETWEEN PERTINENT CODES AND REGULATIONS AND THE REQUIREMENTS OF THE REFERENCED STANDARDS OR THESE SPECIFICATIONS, PROVISIONS OF THE MORE STRINGENT SHALL GOVERN.

2.0 MATERIALS

2.1 MEMBERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE.

2.1.1 PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 ksi AND A MINIMUM TENSILE STRENGTH OF 65 ksi. SUBMIT THE CHOSEN SPECIFICATION TO BIRDAIR FOR APPROVAL.

2.1.2 PLATE AND BARS SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 ksi. SUBMIT THE CHOSEN SPECIFICATION TO BIRDAIR FOR APPROVAL.

2.1.3 ROUND PINS SHALL HAVE A MINIMUM YIELD STRENGTH OF 42 ksi. SUBMIT THE CHOSEN SPECIFICATION TO BIRDAIR FOR APPROVAL.

2.1.4 PINS 3 INCHES (75 mm) OR LARGER IN DIAMETER SHALL CONTAIN A 1/4 INCH (6 mm) CHAMFER UNLESS NOTED OTHERWISE.

2.2 BOLTS AND WELDS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE.

2.2.1 HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM A 325, TYPE 1, HEAVY HEX. NUTS SUITED FOR HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM A 563, GRADE DH, HEAVY HEX. HARDENED STEEL WASHERS SHALL CONFORM TO ASTM F 436, TYPE 1, CIRCULAR.

2.2.2 COMMON BOLTS SHALL CONFORM TO ASTM A 307. NUTS SUITED FOR COMMON BOLTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX. COMMON FLAT WASHERS SHALL CONFORM TO ASTM F 844, OR ANSI B18.22.1 (USS).

2.2.3 THREADS FOR BOLTS, STUDS AND NUTS SHALL CONFORM TO ANSI/ASME B1.1, RIGHT HAND, UNIFIED COARSE THREAD SERIES (UNC), AND SHALL HAVE CLASS 2A TOLERANCE UNLESS NOTED OTHERWISE.

2.2.4 DIMENSIONS OF FASTENERS SHALL CONFORM TO THE REQUIREMENTS OF ANSI/ASME B 18.2.1, "SQUARE AND HEX BOLTS AND SCREWS", UNLESS NOTED OTHERWISE.

2.2.5 WHERE NOTED, ALL HOT DIP GALVANIZED, "GALVANIZED" FASTENERS SHALL CONFORM TO ASTM A153, CLASS C.

2.2.6 WHERE NOTED, ALL MECHANICALLY DEPOSITED, "PLATED" FASTENERS SHALL CONFORM TO ASTM B695, CLASS 50.

2.2.7 ELECTRODES SHALL BE E70XX, 70 KSI YIELD STRENGTH.

2.3 BIRDAIR SHALL BE SUPPLIED WITH MILL CERTIFICATES INDICATING ALL MATERIALS MEET OR EXCEED THEIR SPECIFIED YIELD STRENGTHS.

2.4 FABRICATED PIECES DESIGNATED AS GALVANIZED SHALL BE HOT DIP GALVANIZED PER ASTM A 123. NO PAINT SHALL BE APPLIED TO THESE PIECES, UNLESS NOTED OTHERWISE.

3.0 EXECUTION

3.1 INSPECTION AND QUALITY CONTROL

3.1.1 STEEL FABRICATOR SHALL PROVIDE EFFECTIVE, FULL TIME QUALITY CONTROL OVER ALL FABRICATION ACTIVITIES. BIRDAIR OR ITS TESTING AGENCY MAY VISIT THE PLANT AT ANY TIME TO VERIFY THAT A QUALITY CONTROL PROGRAM IS IN PLACE, AND TO SPOT CHECK WELDMENTS AND WELDING PROCEDURES. THIS INSPECTION DOES NOT RELIEVE THE STEEL FABRICATOR FROM MEETING THE QUALITY AND WORKMANSHIP REQUIREMENTS OF THIS SPECIFICATION.

3.1.2 STEEL FABRICATOR SHALL PROVIDE VISUAL INSPECTION TO ENSURE ALL WELDS CONFORM TO AWS STANDARDS. IN ADDITION, STEEL FABRICATOR SHALL PROVIDE NON-DESTRUCTIVE TESTING INCLUDING ULTRASONIC, MAGNETIC PARTICLE, DYE-PENETRANT, OR X-RAY AS NOTED ON DRAWINGS OR PROJECT SPECIFICATION.

3.1.3 STEEL FABRICATOR SHALL TEST FIT AND MATCH MARK ALL MEMBERS, WELDMENTS AND CONNECTIONS AS NOTED ON THE DRAWINGS.

3.2 SHOP DRAWINGS

3.2.1 STEEL FABRICATOR SHALL SUBMIT SHOP DRAWINGS BASED UPON DESIGN DRAWINGS PROVIDED BY BIRDAIR.

3.2.2 SHOP DRAWINGS SHALL SHOW ALL SHOP AND ERECTION DETAILS OF THE STRUCTURAL STEEL MEMBERS AND COMPONENTS INCLUDING BUT NOT LIMITED TO: OVERALL ERECTION PLAN(S) INDICATING WHERE ALL PIECES ARE LOCATED, IDENTIFICATION MARKS, CUTS, COPES, HOLES, FASTENERS, HOLE SPACINGS, AND WELDS, BOTH SHOP AND FIELD, USING WELDING SYMBOLS AS RECOMMENDED BY AWS.

3.2.3 IF REQUIRED THE STEEL FABRICATOR SHALL SUBMIT A MINIMUM OF TWO (2) PRINTS OF ALL SHOP DRAWINGS TO BIRDAIR.

3.3 WORKMANSHIP

3.3.1 GRIND ALL SHARP EDGES AND CORNERS.

3.3.2 STAMP ALL ASSEMBLIES WITH THE APPROPRIATE PART NUMBER.

3.3.3 ALL WORK SHALL BE FREE OF OIL, GREASE, AND MACHINING CHIPS.

3.3.4 WELDED CONNECTIONS

3.3.4.1 ALL WELDED JOINTS SHALL CONFORM TO AWS PREQUALIFIED WELDED JOINTS AS DESIGNATED BY THE STANDARD WELD SYMBOLS AND TERMS AS SHOWN ON THE DRAWINGS.

3.3.4.2 WELDS SHALL BE MADE ONLY BY OPERATORS WHO HAVE BEEN PREVIOUSLY QUALIFIED BY TESTS, AS PRESCRIBED IN THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY, D1.1, "STRUCTURAL WELDING CODE", TO PERFORM THE TYPE OF WORK REQUIRED. SUBMIT WELDERS CERTIFICATION TO BIRDAIR FOR RECORD PURPOSES.

3.3.4.3 NO MEMBERS SHALL BE SPLICED WITHOUT PRIOR APPROVAL OF BIRDAIR.

3.3.5 BOLTED CONNECTIONS

3.3.5.1 ALL BOLTED JOINTS SHALL BE SHEAR/BEARING CONNECTIONS AND SHALL BE INSTALLED AND TIGHTENED TO A SNUG TIGHT CONDITION.

3.3.5.2 NO OXYGEN-CUT HOLES FOR BOLTED CONNECTIONS SHALL BE PERMITTED.

EARTH TECH
105 Madison Avenue
New York, New York 10016

Earth Tech reviews as to approval of this submittal are only to determine compliance with information given in the Contract Documents and conformance with the concept of the Project as a functioning whole. The Contractor is responsible for dimensions that shall be confirmed and correlated at the job site, for fabrication, shipping, handling, storage, assembly, erection and construction; and for all safety aspects of such activities and construction; and for performing the Work and for coordinating the Work.

APPROVED
APPROVED AS NOTED
FILE NO.
FILE APPROVED AS
DATE ____ By ____

SHOP PAINTING NOTES:

1. ALL MATERIAL SHALL BE SHOP PAINTED TO MEET SUFFICIENT QUANTITY OF THE FOLLOWING:
   PRIMER – (CARBO ZINC 11HS) INORGANIC ZINC-RICH AT A DRY FILM THICKNESS OF 3.0 TO 6.0 mils [75 TO 100 um]
   TOP OF FLANGES TO BE IN CONTACT WITH CONCRETE SHALL ONLY BE COATED FOR 1" [25mm] FROM EACH EDGE
   INTERMEDIATE – (CARBOLINE 893) EPOXY AT A DRY FILM THICKNESS OF 6.0 mils [100 um]
   FINISH – (CARBOLINE 133HB) POLYURETHANE TOPCOAT (COLOR – FEDERAL STANDARD 36463, GREY) DRY FILM THICKNESS OF 3 mils [75 um]

(A)

1

D258593 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
W. 49TH ST. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET 103 R3 OF 142
R3

AS-BUILT REVISION

(1) CLOUDED AREA DENOTES CHANGES SEE SHT. 103R2

SIGNATURE

11/26/02
DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

STATE OF NEW YORK
MICHAEL IANNUZZI
No. 072174
LICENSED PROFESSIONAL ENGINEER

SUBMITTED FOR
Nov 07 2002
APPROVAL

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	10-3-02	JAC	MI	MI

REVISIONS

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NAME	DATE
DRAWN BY JAC	8-15-02
CHECKED BY MI	8-15-02
ENGINEER MI	8-15-02
FINAL REVIEW	
SCALE AS NOTED	

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9650

TITLE
STEEL
STEEL & PAINT SPECIFICATIONS
INTREPID PEDESTRIAN BRIDGE

DWG. NO. 02010 D 3000 REV A

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	104R	142

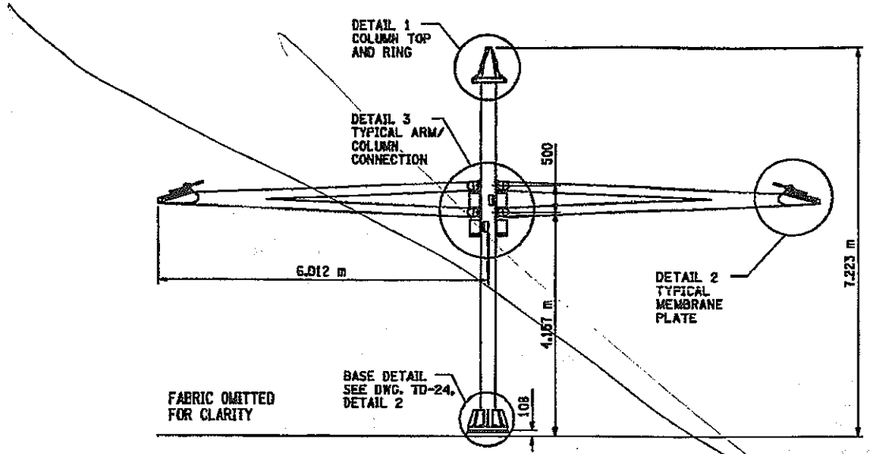
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INTREPID PEDESTRIAN BRIDGE

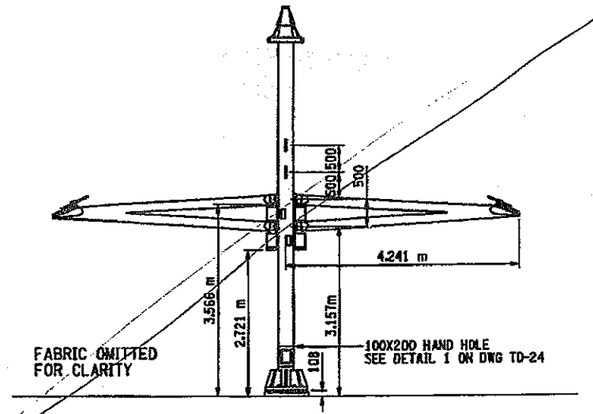
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

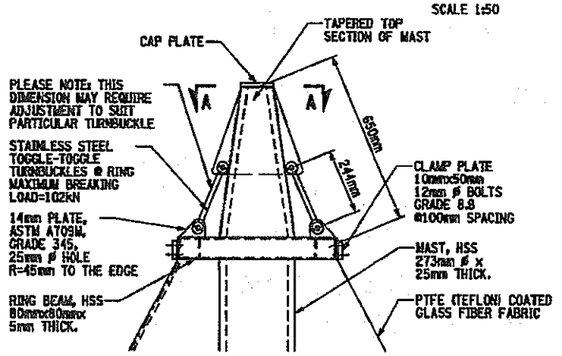
ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS DESIGNED BY: GF, AS CHECKED BY: IN CHARGE OF: BT



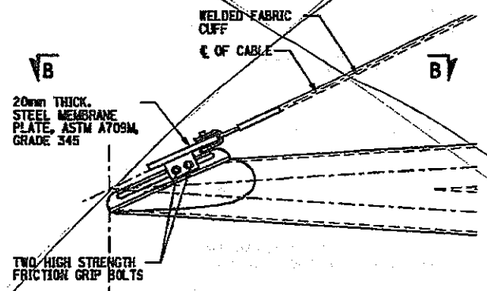
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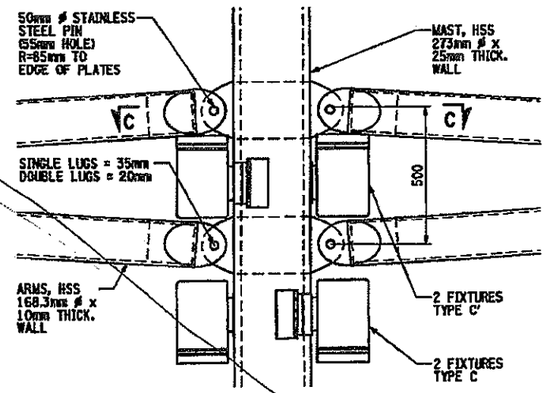
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SCALE 1:50



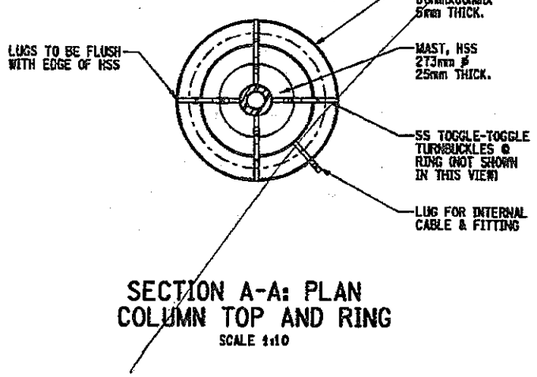
DETAIL 1: ELEVATION COLUMN TOP AND RING
SCALE 1:10



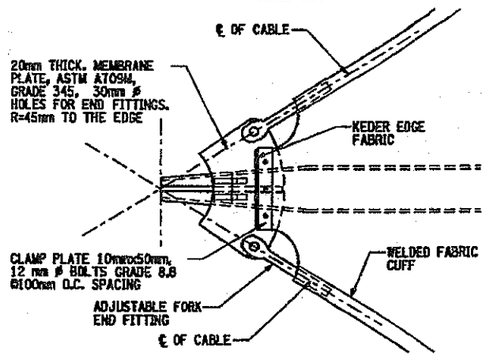
DETAIL 2: ELEVATON MEMBRANE PLATE
SCALE 1:10



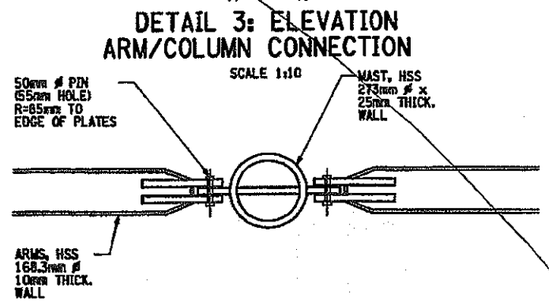
DETAIL 3: ELEVATION ARM/COLUMN CONNECTION
SCALE 1:10



SECTION A-A: PLAN COLUMN TOP AND RING
SCALE 1:10



SECTION B-B: PLAN MEMBRANE PLATE
SCALE 1:10



SECTION C-C: PLAN ARM/COLUMN CONNECTION
SCALE 1:10

THIS SHEET IS superseded by SHEETS 104 F1 THRU 104 F8

NOTES:

1. FOR GENERAL NOTES, REFER TO DRAWING TD-22.
2. ALL WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 11634.9901M UNLESS OTHERWISE NOTED.
3. ALL STEEL SHALL BE PAINTED FEDERAL STANDARD COLOR 36463, PAYABLE UNDER ITEM 11634.9901M. DO NOT PAINT STAINLESS STEEL.

AS-BUILT REVISIONS R1 R2

1 SEE SHEETS 104 F1 THRU 104 F8 FOR FIELD CHANGES

SIGNATURE — DATE 5/14/09

TENSIONED FABRIC ROOF DETAILS 2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

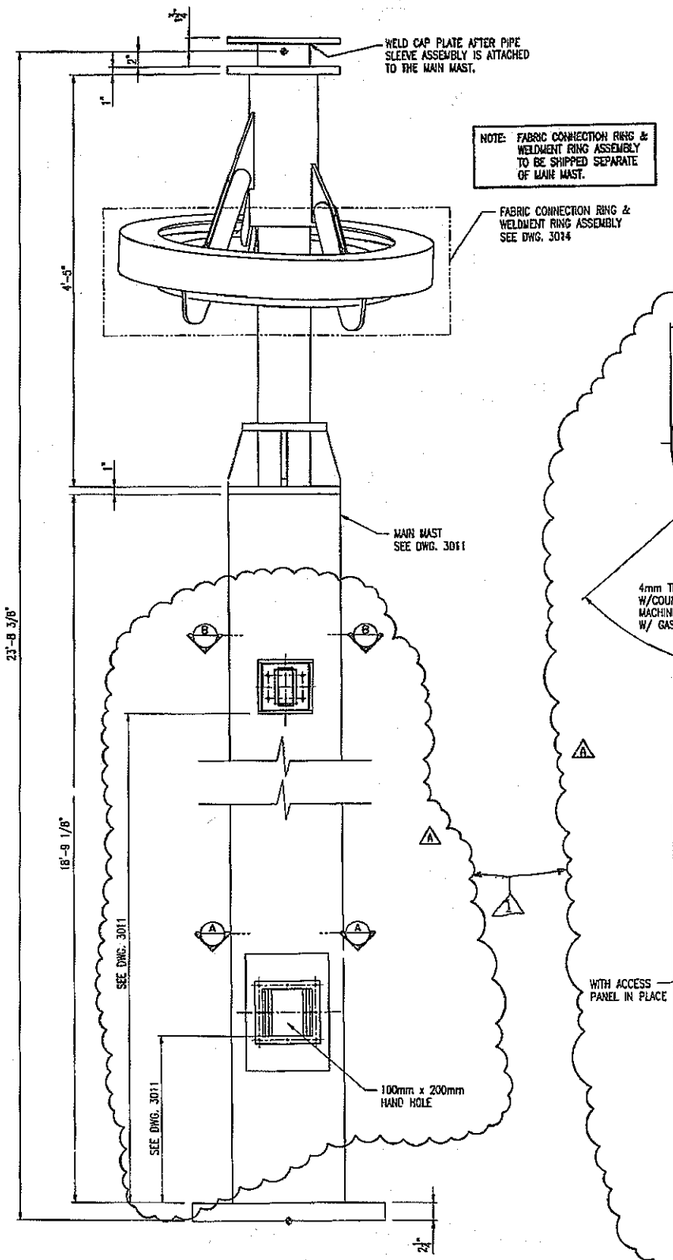
DWG. NO.	DATE	SCALE
TD-23	DEC. 2000	AS SHOWN

BARBARA THAYER, P.C.
350 WEST 42ND STREET
NEW YORK, NEW YORK

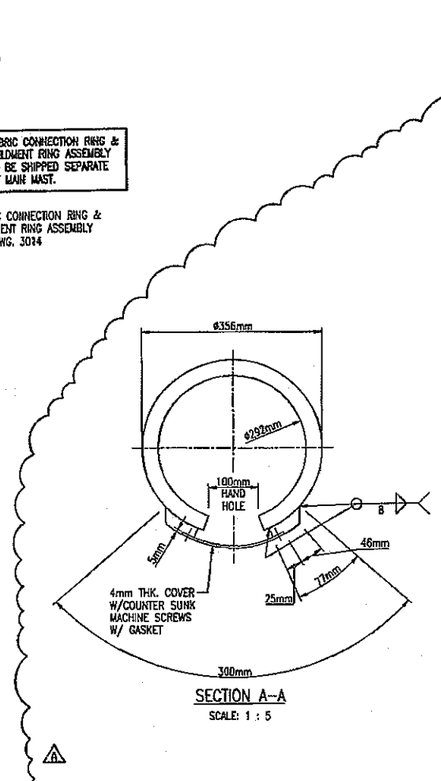
EARTH TECH

D256593 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
W. 46TH ST. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

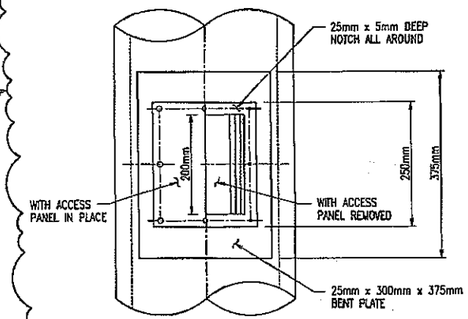
SHEET ~~104 OF~~ 104R2 OF 14-2



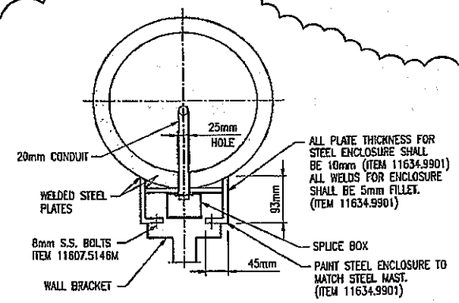
MAIN MAST ASSEMBLY
SCALE: 1 1/2" = 1'-0"



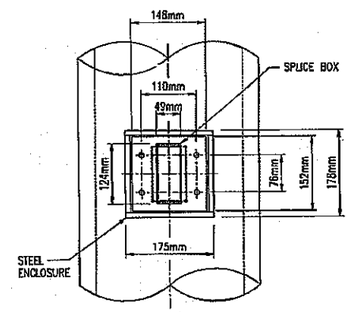
SECTION A–A
SCALE: 1 : 5



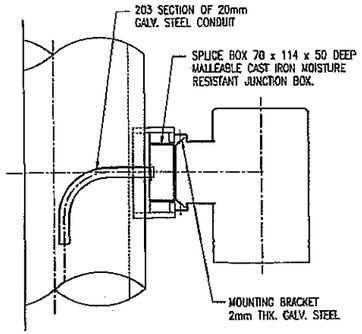
FRONT VIEW A–A
SCALE: 1 : 5



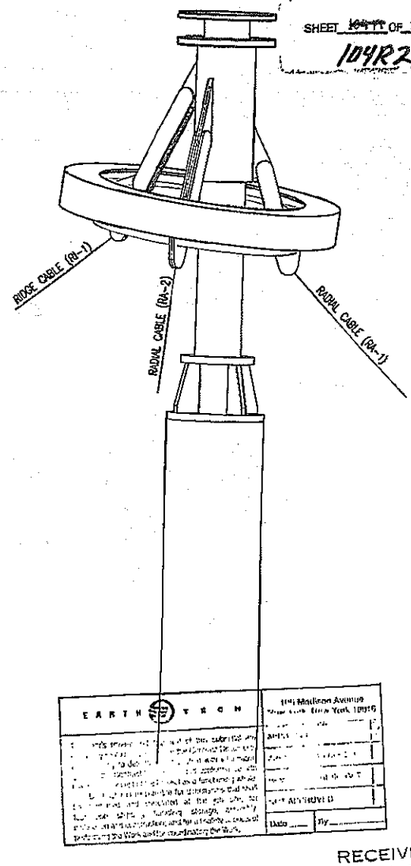
SECTION B–B
SCALE: 1 : 5



FRONT VIEW B–B
SCALE: 1 : 5



SIDE VIEW B–B
SCALE: 1 : 5



RECEIVED
BIRDAIR, INC.

AS-BUILT REVISION
1 CLOUDED AREAS SHOWS CHANGES SEE SHTS 104R2 THRU 104R4
SIGNATURE
DATE

SUBMITTED FOR
Nov 07 2002
APPROVAL

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	10-8-02	JAC	MI	MI

REVISIONS

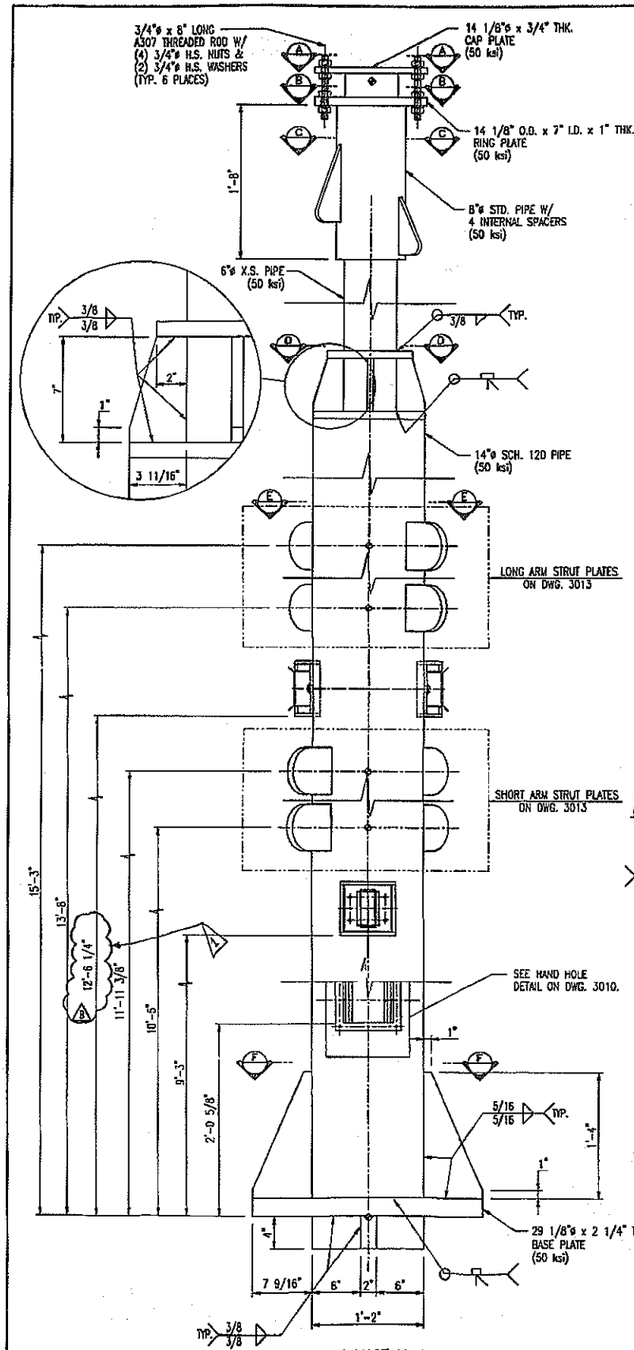
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	NAME	DATE
DRAWN BY	JAC	7-31-02
CHECKED BY	MI	7-31-02
ENGINEER	MI	7-31-02
FINAL REVIEW		
SCALE	AS NOTED	

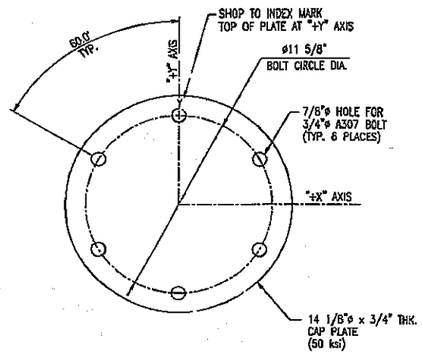
BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9850

TITLE
STEEL
MAIN MAST ASSEMBLY
INTREPID PEDESTRIAN BRIDGE

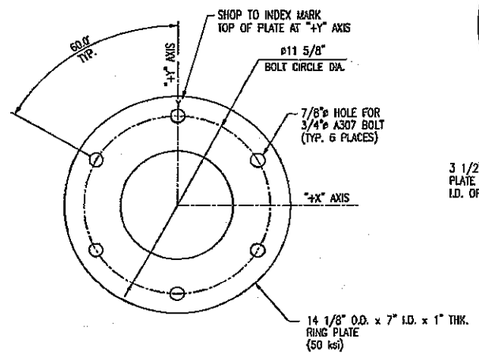
DWG NO. 02020 D 3010 REV A



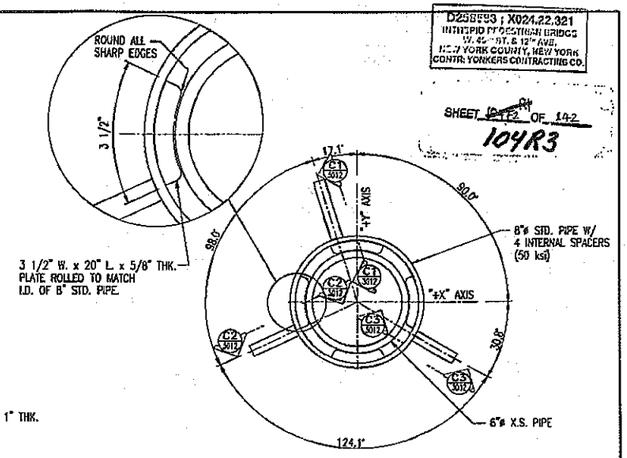
MAIN MAST M-1
(TYPICAL 2 PLACES)
SCALE: 1 1/2" = 1'-0"



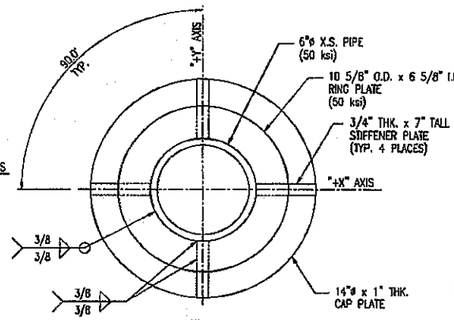
SECTION A-A
SCALE: 3" = 1'-0"



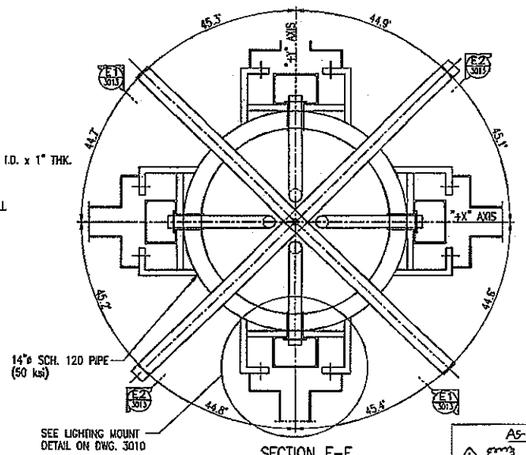
SECTION B-B
SCALE: 3" = 1'-0"



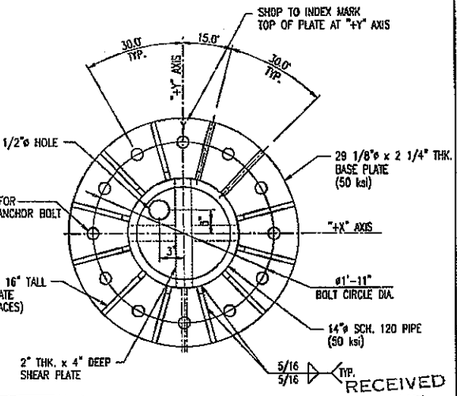
SECTION C-C
SCALE: 3" = 1'-0"



SECTION D-D
SCALE: 3" = 1'-0"



SECTION E-E
SCALE: 1 1/2" = 1'-0"



SECTION F-F
SCALE: 1 1/2" = 1'-0"

D258593 ; X024,22,321
INTREPID PEDESTRIAN BRIDGE
W. 45TH ST. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET 104R2 OF 104R2
104R3

RECEIVED
NOV 14 2002
BIRDAIR, INC.

AS-BUILT REVISIONS
1 ADD CLOUDED AREA SHOWES CHANGES. SEE SHTS 104R2 THRU 104R9

SIGNATURE
DATE

SUBMITTED FOR
Nov 07 2002
APPROVAL

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
B	GENERAL REVISIONS	11-5-02	JAC	MI	MI
A	GENERAL REVISIONS	10-9-02	JAC	MI	MI

REVISIONS

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NAME	DATE
DRAWN BY JAC	7-31-02
CHECKED BY MI	7-31-02
ENGINEER MI	7-31-02
FINAL REVIEW	
SCALE AS NOTED	

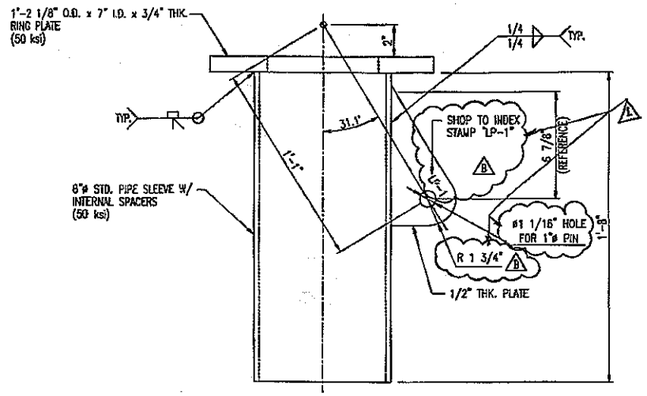
BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9850

TITLE
STEEL
MAIN MAST M-1
INTREPID PEDESTRIAN BRIDGE

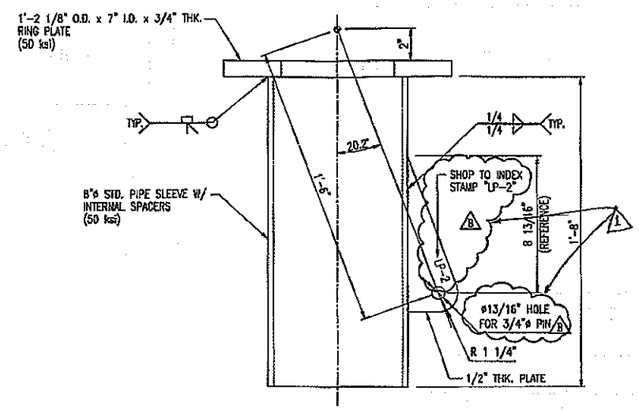
DWG NO. 02020 D 3011
REV B

EASTERN STEEL
195 Madison Avenue New York 10016
APPROVED
APPROVED AS NOTED
RESUBMIT AS CORRECTED
NOT APPROVED
Date ____ By ____

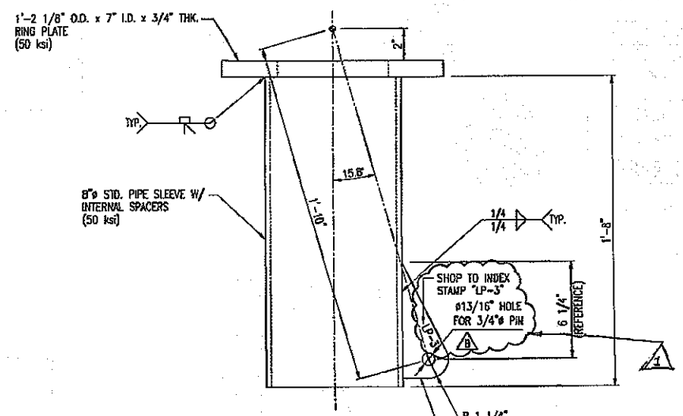
DESIGN : XO°%.22.321
INTREPID PEDESTRIAN BRIDGE
W. 46th ST. & 12th AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.



SECTION C1–C1
SCALE: 3" = 1'-0"



SECTION C2–C2
SCALE: 3" = 1'-0"



SECTION C3–C3
SCALE: 3" = 1'-0"

AS-BUILT REVISION	
1	CLOUDED AREAS SHOWED CHANGES SEE SHEETS 104R2 THRU 104R9

SIGNATURE

5/26/04
DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.



SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH
100 Madison Avenue
New York 10016

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
B	GENERAL REVISIONS	11-5-02	JAC	MI	MI
A	GENERAL REVISIONS	10-9-02	JAC	MI	MI

REVISIONS

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NAME	DATE
DRAWN BY JAC	7-31-02
CHECKED BY MI	7-31-02
ENGINEER MI	7-31-02
FINAL REVIEW	

SCALE: AS NOTED

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9258

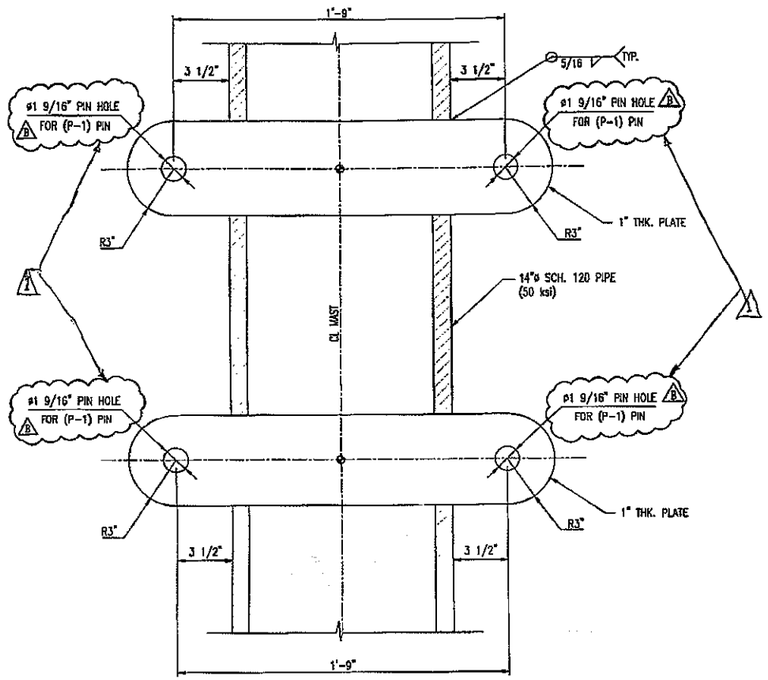
TITLE
STEEL
PIPE SLEEVE SECTIONS
INTREPID PEDESTRIAN BRIDGE

DWG. NO. 02020 D 3012

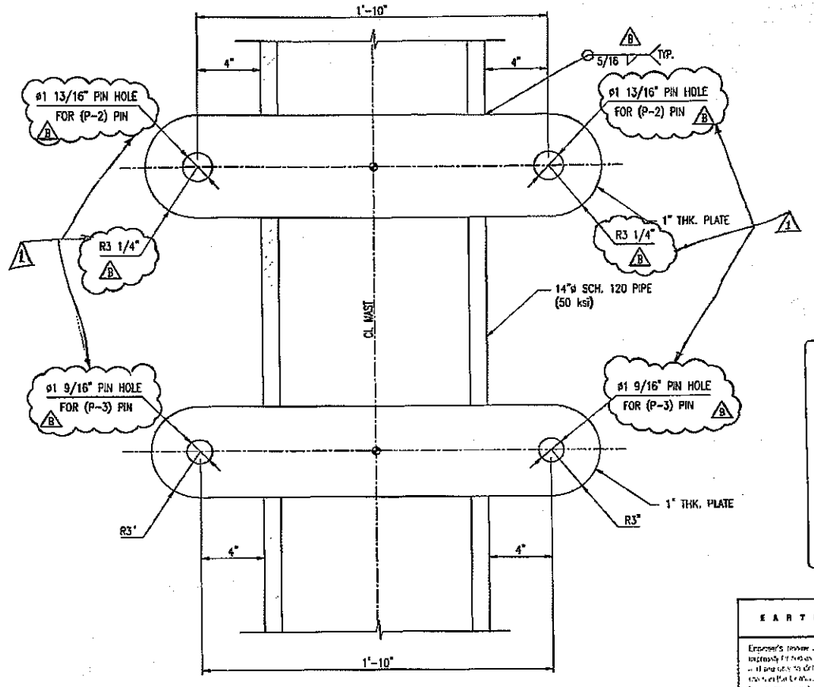
REV B

BILL OF MATERIAL 104R5

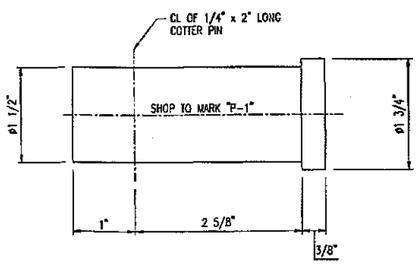
MARK No.	QTY. ORDERED	QTY. REQ'D.	DESCRIPTION	MATERIAL	WEIGHT		REF. DWG.
P-1	8	8	LONG ARM STRUT PINS				
P-2	4	4	SHORT ARM STRUT PIN FOR 6" STRUT				
P-3	4	4	SHORT ARM STRUT PIN FOR 4" STRUT				



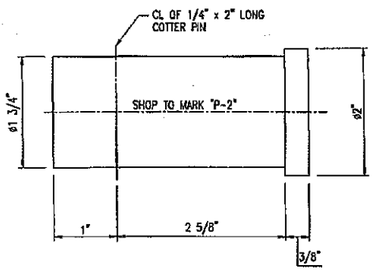
SECTION E1-E1
LONG ARM STRUT PLATES
SCALE: 3" = 1'-0"



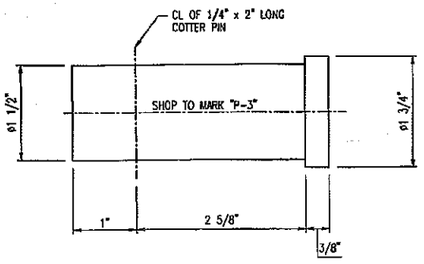
SECTION E2-E2
SHORT ARM STRUT PLATES
SCALE: 3" = 1'-0"



PIN (P-1)
SCALE: 1 = 1



PIN (P-2)
SCALE: 1 = 1



PIN (P-3)
SCALE: 1 = 1

AS-BUILT REVISION

1 CLOUDED AREA DENOTES CHANGES SEE SHTS 104R2 THRU 104R9

SIGNATURE 1/24/04 DATE

EARTH TECH

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

SUBMITTED FOR
Nov 07 2002
APPROVAL

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
B	GENERAL REVISIONS	11-5-02	JAC	MI	MI
A	GENERAL REVISIONS	10-9-02	JAC	MI	MI

REVISIONS

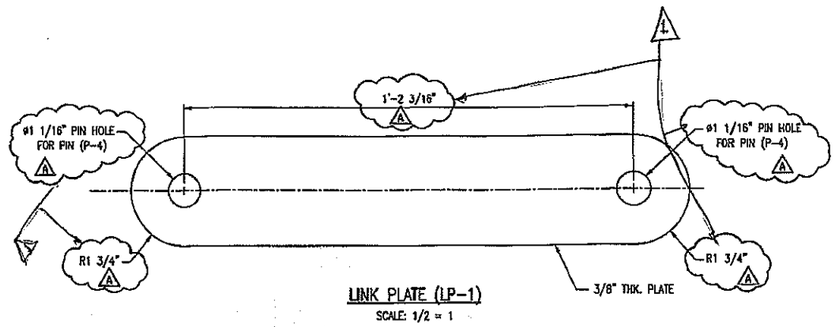
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NAME	DATE
DRAWN BY JAC	7-31-02
CHECKED BY MI	7-31-02
ENGINEER MI	7-31-02
FINAL REVIEW	
SCALE AS NOTED	

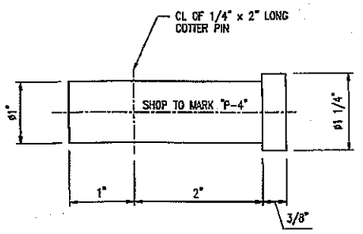
BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9850

TITLE
STEEL
ARM PLATE DETAILS
INTREPID PEDESTRIAN BRIDGE

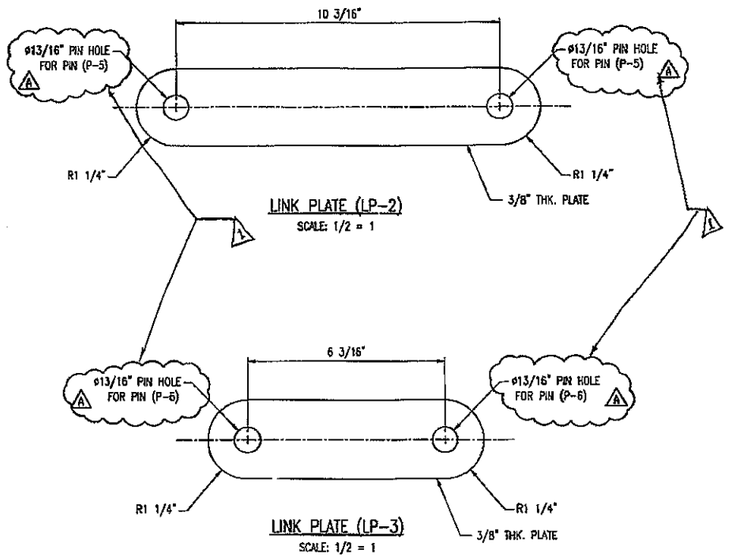
DRG. NO. 02020 D 3013 REV B



LINK PLATE (LP-1)
SCALE: 1/2 = 1

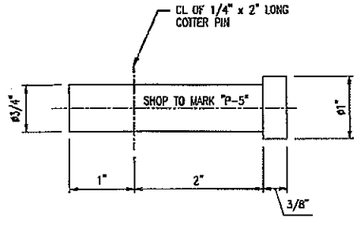


PIN (P-4)
SCALE: 1 = 1

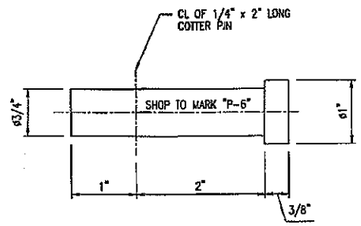


LINK PLATE (LP-2)
SCALE: 1/2 = 1

LINK PLATE (LP-3)
SCALE: 1/2 = 1



PIN (P-5)
SCALE: 1 = 1



PIN (P-6)
SCALE: 1 = 1

BILL OF MATERIAL 104R6

MARK No.	QTY. ORDERED	QTY. REQ'D.	DESCRIPTION	MATERIAL	WEIGHT		REF. DWG.
LP-1	4	4	LINK PLATE				
LP-2	4	4	LINK PLATE				
LP-3	4	4	LINK PLATE				
P-4	4	4	LINK PLATE PIN				
P-5	4	4	LINK PLATE PIN				
P-6	4	4	LINK PLATE PIN				

D26803 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
W. 49TH ST. & 12TH AVE.
N.Y. YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET ~~104~~ 81 OF 142

AS-BUILT REVISION

⚠ CLOUDED AREAS SHOWER CHANGES
SEE SHTS. 104 R2 THRU 104 R9

SIGNATURE DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH
100 Madison Avenue
New York, New York 10016

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	11-6-02	JAC	MI	MI

REVISIONS

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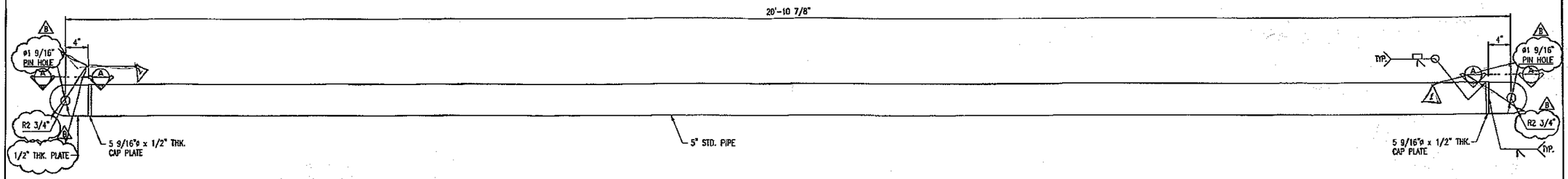
NAME	DATE
DRAWN BY JAC	8-12-02
CHECKED BY MI	8-12-02
ENGINEER MI	8-12-02
FINAL REVIEW	
SCALE AS NOTED	

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-3500 FAX: 716-633-9850

TITLE
STEEL
LINK PLATES
INTREPID PEDESTRIAN BRIDGE

DWG. NO. 02020 D 3016 REV A

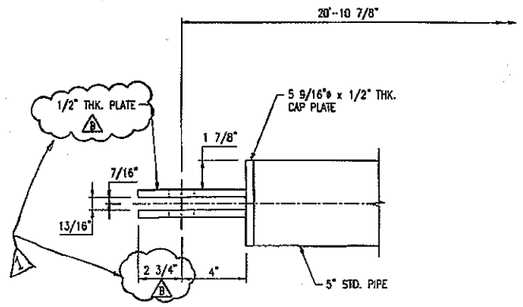
104R7



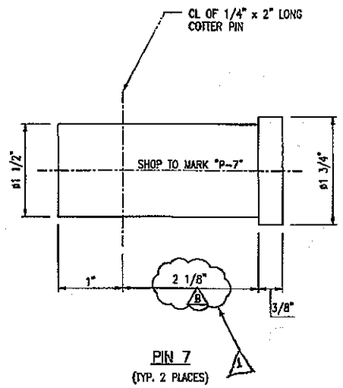
CONNECTION STRUT (ST-4) – ELEVATION
SCALE: 1 1/2" = 1'-0"

D2[illegible]3 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
12TH AVE. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET 104 Rev B OF 14-2



SECTION A-A
SCALE: 3" = 1'-0"



PIN 7
(TYP. 2 PLACES)
SCALE: 1 = 1

AS-BUILT REVISION

1 CLOUDED AREAS SHOWES CHANGES. SEE SHEETS 104R2 THRU 104R9

SIGNATURE

11/14/02
DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH
100 Madison Avenue
New York, New York 10016

[illegible] reviewed as to conformance with the substantial design concepts and compliance with the Contract Documents and contributes no control over construction means, methods, techniques, sequences or procedures. The Contractor is responsible for dimensions that shall be confirmed and correlated at the job site, for fabrication processes and techniques of construction, coordination of his work with that of all other trades and the satisfactory performance of his work. The Contractor is responsible for safety precautions and programs in connection with the Work and for coordinating the Work.

APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT APPROVED
Date ____ By ____

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
B	GENERAL REVISIONS	11-6-02	JAC	MI	MI
A	GENERAL REVISIONS	10-9-02	JAC	MI	MI

REVISIONS

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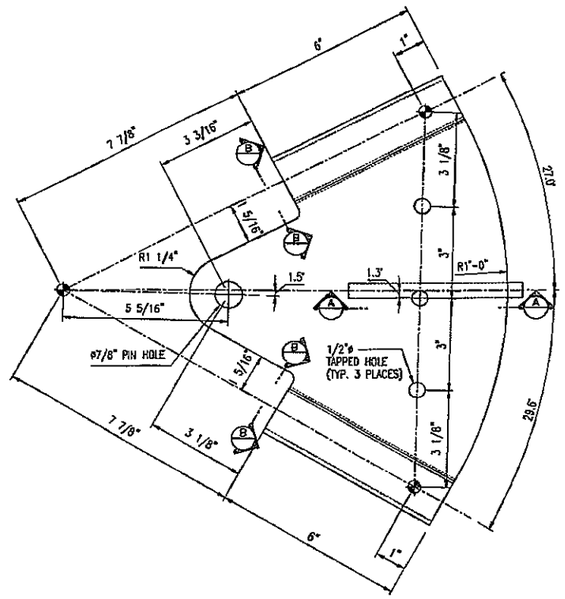
NAME	DATE
DRAWN BY JAC	7-30-02
CHECKED BY MI	7-30-02
ENGINEER MI	7-30-02
FINAL REVIEW	
SCALE AS NOTED	

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9550

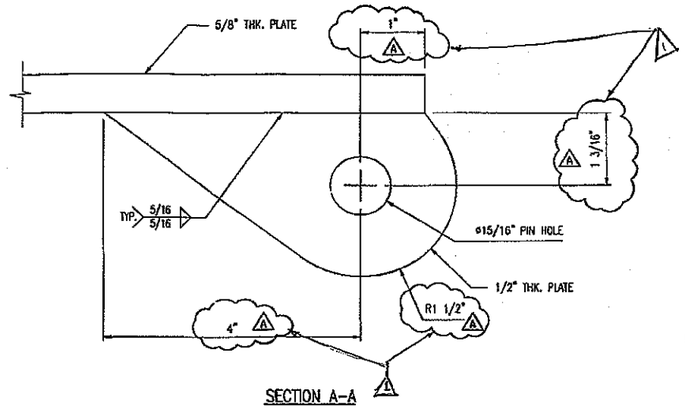
TITLE
STEEL
CONNECTION STRUT ST-4
INTREPID PEDESTRIAN BRIDGE

DWG. NO 02020 D 3050

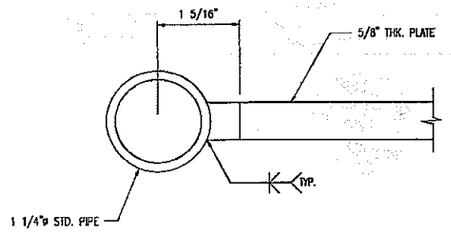
REV B



MEMBRANE PLATE (MP-1)
SCALE: 1/2 = 1



SECTION A-A
SCALE: 1 = 1



SECTION B-B
SCALE: 1 = 1

D2[illegible] 3 : X02[illegible] .1
INTREPID PEDESTRIAN [illegible] 00S
W. 49TH ST. & 12TH AVE.
NEW YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

SHEET 104 RZ OF 142

AS-BUILT REVISION
4 CLOUDED AREAS SHOWN ON CHANGES. SEE SHEETS 104 RZ THRU 104 RA
SIGNATURE DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH
105 Madison Avenue
New York, New York 10016
Engineer's review and approval of this submittal and [illegible] indicated in the Contract Documents [illegible] the Contractor's [illegible] and coordination with the requirements of the work and the Contract Documents. [illegible] check and be responsible for dimensions that shall be confirmed and correlated at the job site. For [illegible] fabricating, erecting, storage, assembly or installation of [illegible] and for all safety precautions [illegible] with the Work and for coordinating the Work.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT APPROVED
Date By

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	11-6-02	JAC	MI	MI

REVISIONS

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NAME	DATE
DRAWN BY JAC	8-8-02
CHECKED BY MI	8-8-02
ENGINEER MI	8-8-02
FINAL REVIEW	
SCALE AS NOTED	

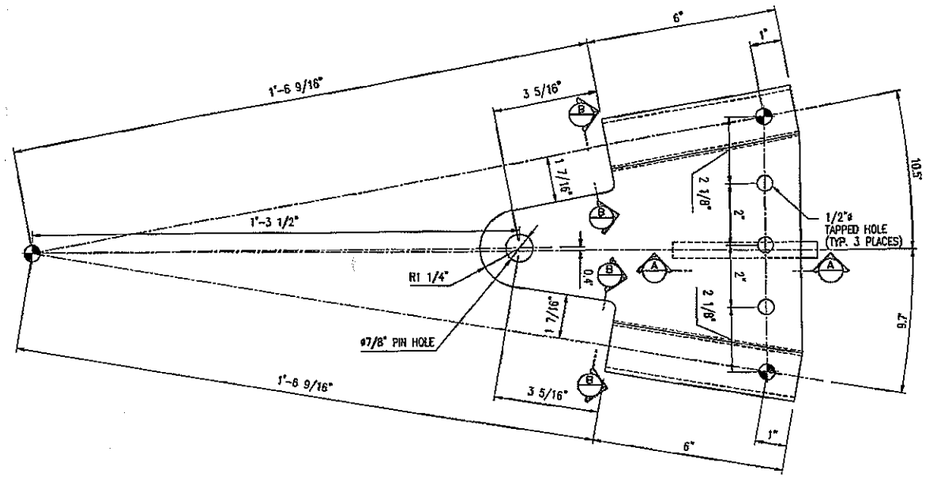
BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9550

TITLE:
STEEL
MEMBRANE PLATE MP-1
INTREPID PEDESTRIAN BRIDGE

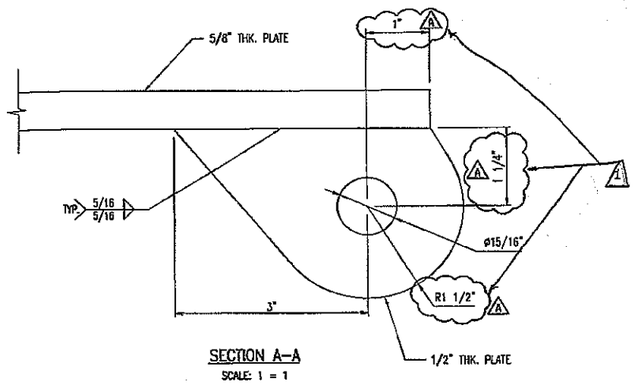
DWG NO 02020 D 3100 REV A

D262033 ; X024.22.321
INTREPID PEDESTRIAN BRIDGE
W. 46TH ST. & 12TH AVE.
YORK COUNTY, NEW YORK
CONTR: YONKERS CONTRACTING CO.

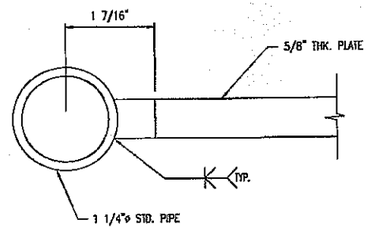
SHEET 104R9 OF 142



MEMBRANE PLATE (MP-2)
SCALE: 1/2 = 1



SECTION A-A
SCALE: 1 = 1



SECTION B-B
SCALE: 1 = 1

AS-BUILT REVISION
1 CLOUDED AREAS SHOWES CHANGES. SEE SHEETS 104R2 THRU 104R9

SIGNATURE DATE

RECEIVED
NOV 14 2002
BIRDAIR, INC.

11-13-02

STATE OF NEW YORK LICENSED PROFESSIONAL ENGINEER

SUBMITTED FOR
Nov 07 2002
APPROVAL

EARTH TECH
100 Madison Avenue
New York, New York 10016

REV	DESCRIPTION	DATE	DRWN	CHKD	ENGR
A	GENERAL REVISIONS	11-6-02	JAC	MI	MI

REVISIONS

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NAME	DATE
DRAWN BY JAC	8-12-02
CHECKED BY MI	8-12-02
ENGINEER MI	8-12-02
FINAL REVIEW	
SCALE AS NOTED	

BIRDAIR
65 LAWRENCE BELL DRIVE
AMHERST, N.Y. 14221, U.S.A.
TELEPHONE: 716-633-9500 FAX: 716-633-9850

TITLE
STEEL
MEMBRANE PLATE MP-2
INTREPID PEDESTRIAN BRIDGE

DWG. NO. 02020 D 3110 REV A

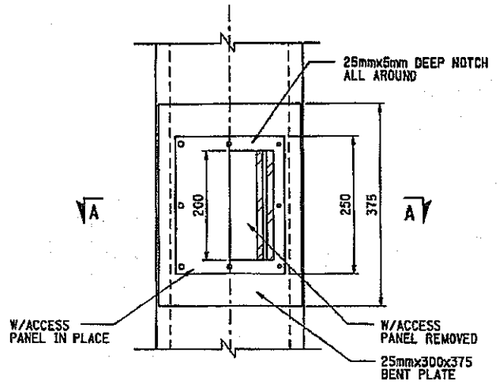
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	105	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

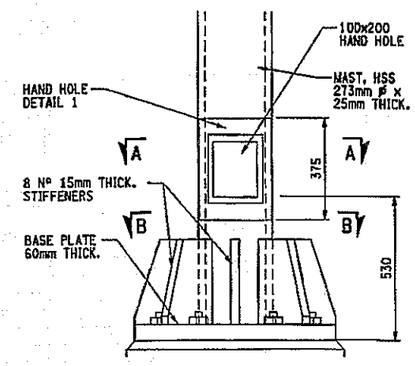
BIN: 1-07788-0

NEW YORK COUNTY PIN: X024.22



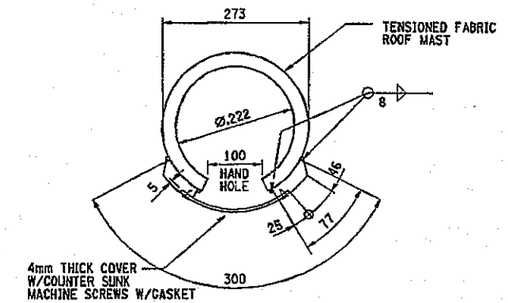
DETAIL 1: ELEVATION OF HAND HOLE

SCALE 1:5



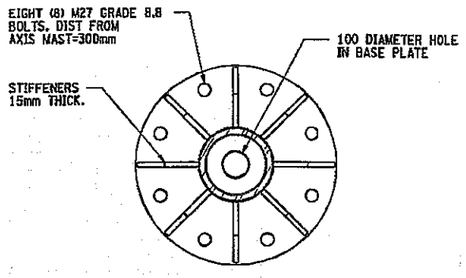
DETAIL 2: ELEVATION BASE DETAIL

SCALE 1:10



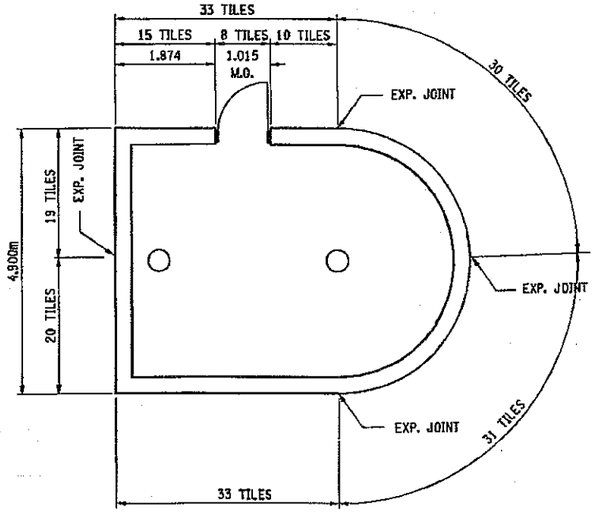
SECTION A-A

SCALE 1:5



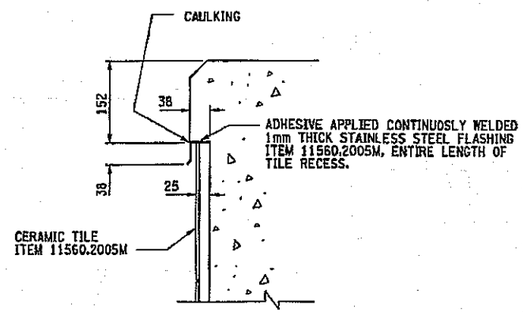
SECTION B-B

SCALE 1:10



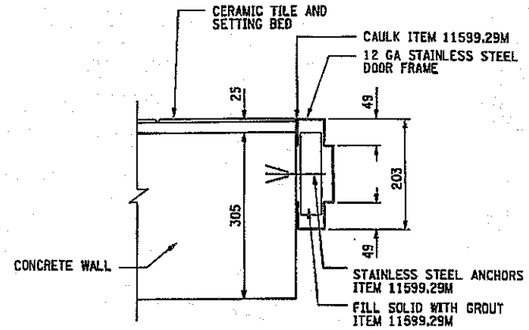
PLAN - ELECTRIC PANEL HOUSE CERAMIC TILE LAYOUT

SCALE 1:50



SECTION C-C
TILE CONDITION AT RAMP

SCALE 1:2.5



DETAIL - DOOR
FRAME AT ELECTRIC PANEL HOUSE

SCALE 1:2.5

NOTE:
1. EXPANSION JOINTS SHOW ON THIS DRAWING ARE SHOWN FOR TILE AND SETTING BED. DETAIL SIMILAR TO DETAIL 3 ON DWG TD-14. EXPANSION JOINT SHALL CONFORM TO REQUIREMENTS OF TILE COUNCIL OF AMERICAN STANDARD DETAIL FOR EXPANSION JOINT.

AS-BUILT REVISIONS

SIGNATURE DATE

TENSIONED FABRIC AND MISC. DETAILS

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-24	DEC. 2000	1 : 10	EARTH TECH

ESTIMATED BY: FS CHECKED BY: JV

DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS

DESIGNED BY: GF, AS CHECKED BY:

IN CHARGE OF: BT

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
RAMP #ET-1 - WALLS																	
16FE01	16	1.33	31	TD6		0.1	0.614	0.205	0.4	C' DIMENSION VARIES: 0.420 m - 0.808 m							64
16FE02	16	0.82	41	17		0.1	0.314	0.40		C' DIMENSION VARIES: 0.120 m - 0.508 m							52
13FE03	13	4.56	4	N1		-									4.56		18
16FE04	16	4.56	10	N1		-									4.56		71
13FE05	13	4.67	1	TD5		3.729	0.945									2.374	5
13FE06	13	4.39	1	TD5		3.442	0.945									2.191	4
13FE07	13	1.71	1	TD5		0.76	0.945									0.484	2
13FE08	13	1.42	1	TD5		0.473	0.945									0.301	1
16FE09	16	1.52	14	TD6		0.1	0.808	0.205	0.4								33
16FE10	16	1.02	18	17		0.1	0.508	0.40									28
16FE11	16	4.67	2	10		3.729	0.945									2.374	15
16FE12	16	4.08	3	10		3.135	0.945									1.996	19
16FE13	16	2.01	3	10		1.067	0.945									0.679	9
16FE14	16	1.42	2	10		0.473	0.945									0.301	4
										TOTAL WEIGHT / RAMP #ET-1 - WALLS							325
RAMP #ET-1 - SLAB																	
16SE01	16	1.54	16	N1												1.535	38
16SE02	16	1.27	7	N1						D' DIMENSION VARIES: 0.400 m - 2.130 m						1.265	14
13SE03	13	5.84	12	N1						D' DIMENSION VARIES: 4.955 m - 6.725 m						5.84	70
13SE04	13	1.54	16	N1												1.535	24
13SE05	13	1.27	7	N1						D' DIMENSION VARIES: 0.400 m - 2.130 m						1.265	9
										TOTAL WEIGHT / RAMP #ET-1 SLAB							155
RAMP #ET-2 - FOOTINGS																	
19F01	19	2.11	120	N1											2.105		565
19F02	19	8.98	6	N1											8.98		161
19F03	19	8.14	8	N1											8.14		146
19F04	19	8.91	8	N1											8.91		159
19F05	19	9.75	8	N1											9.75		174
16F06	16	1.65	116	17		0.3	1.35	0									297
22F07	22	1.65	150	17		0.3	1.35	0									753
										TOTAL WEIGHT / RAMP #ET-2 FOOTINGS							2255
RAMP #ET-2 - WALLS																	
16WE01	16	1.6	44	N1						D' DIMENSION VARIES: 1.328 m - 1.863 m					1.595		109
13WE02	13	0.87	116	17		0	0.645	0.205									100
22WE03	22	1.71	56	17		0	1.3	0.40		C' DIMENSION VARIES: 1.033 m - 1.568 m							291
16WE04	16	1.86	12	N1											1.863		35
22WE05	22	1.98	16	17		0	1.568	0.40									96
16WE06	16	2.39	60	N1						D' DIMENSION VARIES: 2.013 m - 2.773 m					2.393		223
22WE07	22	2.51	78	17		0	2.098	0.40		C' DIMENSION VARIES: 1.718 m - 2.478 m							595
16WE08	16	9.06	22	N1											9.055		606
16WE09	16	8.97	38	N1											8.955		1036
13WE10	13	17.16	4	N1											17.16		68
										TOTAL WEIGHT / RAMP #ET-2 WALLS							3159
RAMP #ET-2 - SLAB																	
16SE01	16	1.54	58	N1											1.535		138
13SE02	13	17.16	12	N1											17.16		205
13SE03	13	1.54	58	N1											1.535		88
										TOTAL WEIGHT / RAMP #ET-2 SLAB							431
RAMP #ET-3 - FOOTINGS																	
19F01	19	2.4	40	N1											2.4		215
19F02	19	3.2	18	N1						'D' DIMENSION VARIES: 0.600 m - 5.800 m					3.2		129
19F03	19	3.34	10	N1											3.34		75
19F04	19	4.81	18	N1						'D' DIMENSION VARIES: 3.270 m - 6.355 m					4.813		194
19F05	19	6.32	18	N1						'D' DIMENSION VARIES: 4.775 m - 7.860 m					6.318		254
19F06	19	1.02	6	N1											1.02		14
16F07	16	1.65	60	17		0.3	1.35	0									154
22F08	22	1.65	73	17		0.3	1.35	0									366
										TOTAL WEIGHT / RAMP #ET-3 FOOTINGS							1401

FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 106.
SEE SHEET 93F2 FOR APPROVAL SIGNATURES.

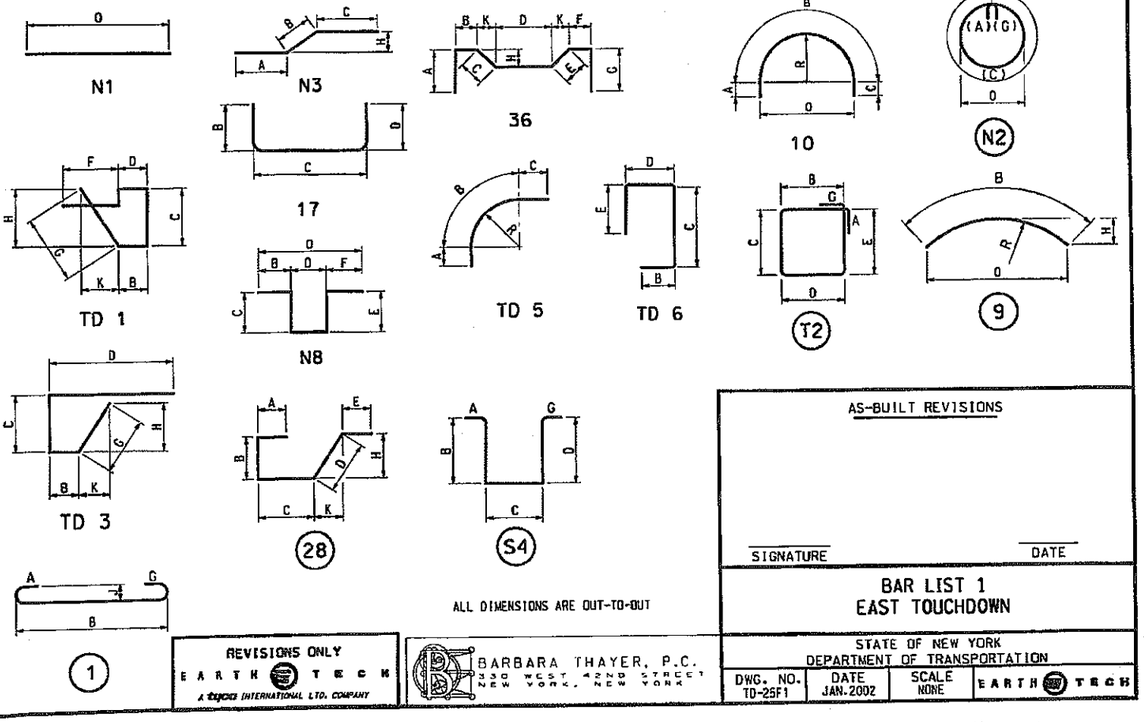
NOTES:

1. ALL BAR DIMENSIONS ARE OUT TO OUT.
2. LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	106F1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY
PIN: X024.22

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
RAMP #ET-3 ABUTMENT WALL																	
22WE01	22	2.61	10	N1											2.613		79
16WE02	16	3.09	4	17		0.59	2.498	0									19
16WE03	16	2.5	6	N1											2.498		23
16WE04	16	2.41	6	N1											2.408		22
13WE05	13	0.7	10	17		0.1	0.6	0									7
19WE06	19	2.87	9	N1											2.87		58
19WE07	19	2.14	9	N1											2.135		43
19WE08	19	1.41	9	N1											1.41		28
19WE09	19	2.14	2	N1											2.135		10
13WE10	13	2.14	3	N1											2.135		6
13WE11	13	2.19	8	T2	0.15	0.35	0.595	0.35	0.595		0.15						17
										TOTAL WEIGHT / RAMP #ET-3 ABUT.WALL							312
RAMP #ET-3 - WALLS																	
16WE01	16	2.94	39	N1											2.94		178
13WE02	13	0.87	39	17		0	0.645	0.205									34
22WE03	22	3.04	39	17		0	2.625	0.40									360
16WE04	16	3.49	21	N1											3.49		223
16WE05	16	3.98	21	N1											3.98		254
16WE06	16	10.09	10	10	1.11	7.87	1.11								5.04	2.505	307
16WE07	16	8.97	11	10	1.11	6.748	1.11								4.296	2.148	300
13WE08	13	3.49	4	N1											3.49		14
13WE09	13	9.15	1	10	0.64	7.87	0.64								5.04	2.505	9
13WE10	13	8.6	1	10	0.64	7.317	0.64								4.654	2.329	9
										TOTAL WEIGHT / RAMP #ET-3 WALLS							1688



ALL DIMENSIONS ARE OUT-TO-OUT

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST 1
EAST TOUCHDOWN

REVISIONS ONLY
EARTH TECH
A TETRA TECH INTERNATIONAL LTD. COMPANY

BARBARA THAYER, P.C.
350 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-25F1	JAN. 2002	NONE	EARTH TECH

M.YE
07/17/2002
L:\WORK\46090\CADD\FIELD CHANGE SHEETS\07-17-02\OLDBARLIST.DGN
L:_GENERAL\PLOTDRV\NYS DOT\NYSDOTT1X17.PLT

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS
ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	106F2	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
RAMP #ET-1 - FOOTINGS																	
19FE18	19	4.445	12	N1											4.445		119
19FE19	19	4.445	12	N1											4.445		119
16FE20	16	1.305	16	17		0.620	0.065	0.620									32
19FE21	19	1.550	16	17		0.750	0.800	0									55
19FE22	19	2.921	16	17		VARIES	0.750	VARIES		'B' VARIES FROM 1.188 TO 1.288							105
											'D' VARIES FROM 0.883 TO 0.983						
16FE23	16	1.305	16	17		0.620	0.065	0.620		'B' VARIES FROM 1.188 TO 1.288							32
19FE24	19	2.921	16	17		VARIES	0.750	VARIES			'D' VARIES FROM 0.883 TO 0.983						105
19FE25	19	1.550	16	17		0.750	0.800	0									55
13FE26	13	4.445	2	N1											4.445		9
13FE27	13	4.445	2	N1											4.445		9
19FE07	19	1.550	4	17		0.750	0.800	0									14
19FE08	19	3.021	4	17		1.288	0.750	0.983									27
16FE09	16	1.305	4	17		0.620	0.065	0.620									8
19FE10	19	3.021	14	17		1.288	0.750	0.983									95
16FE12	16	1.305	14	17		0.620	0.065	0.620									28
19FE13	19	1.550	14	17		0.750	0.800	0									49
19FE14	19	2.410	4	TD5	0.800	0.800	0.800									0.515	22
19FE14	19	2.550	2	TD5	0.800	0.950	0.800									0.605	11
19FE14	19	3.020	2	TD5	0.800	1.420	0.800									0.905	14
19FE14	19	3.165	4	TD5	0.800	1.565	0.800									0.995	28
19FE15	19	4.460	4	TD5	0.800	2.860	0.800									1.820	40
19FE15	19	4.600	2	TD5	0.800	3.000	0.800									1.910	41
19FE15	19	5.070	2	TD5	0.800	3.470	0.800									2.210	45
19FE15	19	5.210	4	TD5	0.800	3.610	0.800									2.300	47
13FE16	13	1.620	1	TD5	0.500	0.620	0.500									0.395	2
13FE16	13	1.816	1	TD5	0.500	0.815	0.500									0.520	2
13FE17	13	4.605	1	TD5	0.500	3.605	0.500									2.295	5
13FE17	13	4.800	1	TD5	0.500	3.800	0.500									2.420	5
										TOTAL WEIGHT / RAMP #ET-1 - FOOTINGS							1123
RAMP #ET-2 - FOOTINGS																	
19F01	19	8.955	8	N1													160
19F02	19	6.180	2	N1													28
19F03	19	6.180	2	N1													28
19F04	19	2.845	44	1	0.200	2.445					0.200		0.155				280
19F05	19	2.455	14	1	0.200	2.055					0.200		0.155				77
19F06	19	8.080	8	N1													145
13F11	13	0.640	27	S5		0.200	0.325		0.078			0.080					17
16F28	16	1.650	116	17		0.300	1.350	0									297
22F29	22	1.650	150	17		0.300	1.350	0									753
										TOTAL WEIGHT / RAMP #ET-2 - FOOTINGS							1785

FIELD CHANGE

THIS SHEET SUPPLEMENTS SHEET 106F1.
SEE SHEET 93F2 FOR APPROVAL SIGNATURES.

NOTES:

LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.

REVISIONS ONLY
EARTH TECH
A TYCO INTERNATIONAL LTD. COMPANY

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST 2
EAST TOUCHDOWN

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-25F2	JAN.2002	NONE	EARTH TECH

ESTIMATED BY: FS CHECKED BY: JV
DESIGNED BY: GF, AS CHECKED BY: JV, FS
IN CHARGE OF: BT DRAFTED BY: EL, RM, IV

XLYE
07/18/2002
L:\WORK\48090\CADD\FIELD CHANGE SHEETS\07-17-02\ET12BARLIST.DGN
L:\GENERAL\PLOTDRV\NYS DOT\NYSDOT11X17.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	107	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	D	R	WEIGHT
RAMP #ET-3 – SLAB																	
16SE01	16	4.5	11	N1											4.5		77
13SE02	13	4.65	24	N1						0' DIM. VARIES: 3.520 m – 5.775m					4.647		111
13SE03	13	2.55	6	N1											2.553		15
13SE04	13	4.5	11	N1											4.5		49
16SE05	16	2.25	6	N1						0' DIM. VARIES: 0.600 m – 3.900m					2.25		21
13SE06	13	1.54	8	N1											1.535		12
13SE07	13	2.25	6	N1						0' DIM. VARIES: 0.600 m – 3.900m					2.25		13
10SE08	10	2.185	11	N8		0.25	0.19	1.305	0.19	0.25							13
10SE09	10	3.49	4	N1											3.49		8
10SE10	10	2.97	1	10	0.48	2.014	0.48									0.641	2
10SE11	10	2.31	1	10	0.48	1.354	0.48									0.431	1
10SE12	10	1.68	12	TD1		0.125	0.34	0.225	0.19	0.4	0.4			0.3			11
13SE13	13	2.93	1	10	0.64	1.652	0.64									0.526	3
13SE14	13	2.63	1	10	0.64	1.354	0.64									0.431	3
16SE15	16	1.84	8	N1											1.84		23
13SE16	13	1.84	8	N1											1.84		15
13SE17	13	1.2	12	N1											1.2		14
10SE18	10	2.553	2	N1											2.553		3
										TOTAL WEIGHT / RAMP #ET-3 – SLAB							394
RAMP #ET-4 – SLAB																	
25SE01	25	8.93	13	N1											8.93		461
13SE02	13	1.83	31	N1											1.83		56
16SE03	16	8.93	7	N1											8.93		97
13SE04	13	2.03	31	17		0.1	1.83	0.1									63
										TOTAL WEIGHT / RAMP #ET-4 – SLAB							677
RAMP #ET-5 – SLAB																	
25SE01	25	8.93	13	N1											8.93		461
13SE02	13	1.83	31	N1											1.83		56
16SE03	16	8.93	7	N1											8.93		97
13SE04	13	2.03	31	17		0.1	1.83	0.1									63
										TOTAL WEIGHT / RAMP #ET-5 SLAB							677
RAMP #ET-6 – SLAB																	
16SE01	16	1.47	15	N1						0' DIMENSION VARIES: 0.600 m – 2.340 m					1.47		34
16SE02	16	1.83	3	N1											1.83		9
13SE03	13	2.63	14	N1						0' DIMENSION VARIES: 0.600 m – 4.650 m					2.63		37
13SE04	13	1.67	15	17		0.1	1.47	0.1		C' DIMENSION VARIES: 0.600 m – 2.340 m							25
13SE05	13	2.03	3	17		0.1	1.83	0.1									6
13SE06	13	1.83	8	N1											1.83		15
										TOTAL WEIGHT / RAMP #ET-6 SLAB							126
RAMP #ET-7 – SLAB																	
25SE01	25	8.93	13	N1											8.93		461
13SE02	13	1.83	31	N1											1.83		56
16SE03	16	8.93	7	N1											8.93		97
13SE04	13	2.03	31	17		0.1	1.83	0.1									63
										TOTAL WEIGHT / RAMP #ET-7 SLAB							677
RAMP #ET-8 – SLAB																	
25SE01	25	8.93	23	N1											8.93		816
25SE02	25	4.77	6	N1						0' DIMENSION VARIES: 0.600 m – 8.930 m					4.77		114
16SE03	16	3.84	31	N1						0' DIMENSION VARIES: 3.380 m – 4.290 m					3.835		185
16SE04	16	8.93	12	N1											8.93		166
16SE05	16	4.77	3	N1						0' DIMENSION VARIES: 0.600 m – 8.930 m					4.77		22
13SE06	13	4.04	31	17		0.1	3.835	0.1		C' DIMENSION VARIES: 3.380 m – 4.290 m							124
										TOTAL WEIGHT / RAMP #ET-8 SLAB							1427

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	D	R	WEIGHT
RAMP #ET-9 – SLAB																	
16SE01	16	5.34	24	N1					0' DIMENSION VARIES: 3.650 m – 7.018 m						5.335		199
16SE02	16	3.65	19	N1											3.65		108
16SE03	16	4.77	4	N1					0' DIMENSION VARIES: 3.650 m – 5.880 m						4.765		30
16SE04	16	10.07	17	N1					0' DIMENSION VARIES: 9.520 m – 10.620 m						10.07		266
16SE05	16	1.52	3	N1					0' DIMENSION VARIES: 0.600 m – 2.430 m						1.52		7
13SE06	13	17.25	26	N1					0' DIMENSION VARIES: 15.775 m – 18.700 m						17.25		446
13SE07	13	3.78	48	N1					0' DIMENSION VARIES: 0.600 m – 6.960 m						3.78		180
13SE08	13	1.89	12	N8		0.4	0.185	0.720	0.185	0.400							17
13SE09	13	4.82	26	N1											4.82		125
13SE10	13	5.34	24	N1					0' DIMENSION VARIES: 3.650 m – 7.018 m						5.335		127
13SE11	13	3.65	19	N1											3.65		69
13SE12	13	4.77	4	N1					0' DIMENSION VARIES: 3.650 m – 5.880 m						4.765		19
13SE13	13	10.07	17	N1					0' DIMENSION VARIES: 3.650 m – 5.270 m						10.07		170
13SE14	13	1.52	3	N1					0' DIMENSION VARIES: 0.600 m – 2.430 m						1.52		5
10SE15	10	1.04	164	28	0	0.225	0.225	0.19	0.4			0.186		0.05			96
13SE16	13	17.62	1	10	0.6	16.37	0.65									3.473	18
13SE17	13	16.71	1	10	0.6	15.46	0.65									3.281	17
13SE18	13	7.99	2	17		0	7.39	0.6									16
13SE19	13	5.7	2	N1											5.7		11
13SE20	13	12.8	1	10	0.6	10.91	1.29									3.473	13
13SE21	13	12	1	10	0.6	10.31	1.09									3.281	12
13SE22	13	7.79	2	17		0	7.19	0.6									15
13SE23	13	3.86	2	N1											3.86		8
										TOTAL WEIGHT / RAMP #ET-9 SLAB							1974
ETD STAIR FOUNDATION – (TOP EL. +3.300)																	
16F01	16	2.13	9	17		0.25	1.875	0									30
16F02	16	2.68	9	17		0.25	1.875	0.55									37
13F03	13	2.44	20	N1											2.44		49
										TOTAL WEIGHT ETD STAIR FOUNDATION–(TOP EL. +3.300)							116
ETD STAIR MID LANDING – SLAB (EL. +5.306)																	
16SE01	16	1.4	10	N1					0' DIMENSION VARIES: 0.600 m – 2.200 m						1.4		22
16SE02	16	1.94	3	N1											1.94		9
13SE03	13	2.36	12	N1					0' DIMENSION VARIES: 0.600 m – 4.115 m						2.36		28
13SE04	13	1.6	10	17		0.1	1.4	0.1	C' DIMENSION VARIES: 0.600 m – 2.200 m								16
13SE05	13	2.14	3	17		0.1	1.94	0.1									6
13SE06	13	1.52	8	N1											1.52		12
									TOTAL WEIGHT ETD STAIR MID LANDING–(TOP EL. +5.306)								93
ETD STAIR TOP LANDING – SLAB (EL. +7.313)																	
16SE01	16	1.83	7	N1											1.83		20
13SE02	13	1.8	14	N1											1.8		25
13SE03	13	2.03	7	17		0.1	1.83	0.1									14
									TOTAL WEIGHT ETD STAIR TOP LANDING–(TOP EL. +7.313)								59

NOTES:

LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.

AS-BUILT REVISIONS

SIGNATURE — DATE

BAR LIST 2
EAST TOUCHDOWN

BARBARA THAYER, P.C.
880 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
TD-26	DEC. 2000	NONE	

DESIGNED BY: CF, AS — CHECKED BY: JV — DRAFTED BY: EL, AM, JV — CHECKED BY: JV, FS — ESTIMATED BY: FS — IN CHARGE OF: BT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	10BF1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

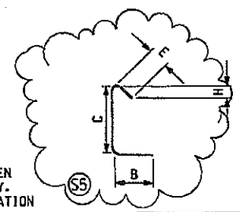
MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
COLUMN FOUNDATION - C1																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	12	17		0.5	1.99	0									151
13FE03	13	3.05	2	N2	0.255		2.545				0.255				0.81		6
										TOTAL WEIGHT / COLUMN FOUNDATION-C1							343
COLUMN PEDESTAL- C1																	
29CE01	29	1.40	12	N1											1.40		85
13CE02	13	3.05	11	N2	0.255		2.545				0.255				0.81		34
										TOTAL WEIGHT / COLUMN PEDESTAL- C1							119
COLUMN FOUNDATION - C2																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	12	17		0.5	1.99	0									151
13FE03	13	3.05	2	N2	0.255		2.545				0.255				0.81		6
										TOTAL WEIGHT / COLUMN FOUNDATION-C2							343
COLUMN PEDESTAL- C2																	
29CE01	29	1.40	12	N1											1.40		85
13CE02	13	3.05	11	N2	0.255		2.545				0.255				0.81		34
										TOTAL WEIGHT / COLUMN PEDESTAL- C2							119
COLUMN FOUNDATION - C3																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	12	17		0.5	1.99	0									151
13FE03	13	3.05	2	N2	0.255		2.545				0.255				0.81		6
										TOTAL WEIGHT / COLUMN FOUNDATION-C3							343
COLUMN PEDESTAL- C3																	
29CE01	29	3.520	12	N1											3.520		214
13CE02	13	3.05	24	N2	0.255		2.545				0.255				0.81		73
										TOTAL WEIGHT / COLUMN PEDESTAL- C3							287
COLUMN FOUNDATION - C4																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	12	17		0.5	1.99	0									151
13FE03	13	3.05	2	N2	0.255		2.545				0.255				0.81		6
										TOTAL WEIGHT / COLUMN FOUNDATION-C4							343
COLUMN PEDESTAL- C4																	
29CE01	29	3.06	12	N1											3.06		186
29CE02	29	3.03	12	N3	0.460	0.270	2.300					0.090					184
13CE03	13	3.05	22	N2	0.255		2.545				0.255				0.81		67
13CE04	13	2.508	3	N2	0.255		1.998				0.255				0.636		7
										TOTAL WEIGHT / COLUMN PEDESTAL- C4							444
COLUMN FOUNDATION - C5																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	8	17		0.5	1.99	0									101
13FE03	13	2.458	2	N2	0.255		2.073				0.255				0.66		5
										TOTAL WEIGHT / COLUMN FOUNDATION-C5							292
COLUMN PEDESTAL- C5																	
29CE01	29	3.61	8	N1											3.61		146
13CE02	13	2.58	25	N2	0.255		2.073				0.255				0.66		64
										TOTAL WEIGHT / COLUMN PEDESTAL- C5							210

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
COLUMN FOUNDATION - C6																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	12	17		0.5	1.99	0									151
13FE03	13	2.51	2	N2	0.255		2				0.255				0.64		5
										TOTAL WEIGHT / COLUMN FOUNDATION - C6							342
COLUMN PEDESTAL- C6																	
29CE01	29	3.61	12	N1											3.61		219
13CE02	13	2.51	25	N2	0.255		2				0.255				0.64		62
										TOTAL WEIGHT / COLUMN PEDESTAL- C6							281
COLUMN FOUNDATION - C7																	
19FE01	19	2.75	18	1	0.200	2.350					0.200		0.155				111
29FE02	29	2.49	8	17		0.500	1.990	0									101
13FE03	13	2.58	2	N2	0.255		2.073				0.255				0.660		5
19FE04	19	2.75	18	1	0.200	2.350					0.200		0.155				111
13FE05	13	0.64	9	S5		0.200	0.325		0.078			0.080					6
16F06	16	0.56	16	1	0.175	0.378					0		0.130				14
										TOTAL WEIGHT / COLUMN FOUNDATION - C7							348
COLUMN PEDESTAL- C7																	
29CE01	29	3.65	8	N1											3.65		148
13CE02	13	2.58	25	N2	0.255		2.073				0.255				0.66		64
										TOTAL WEIGHT / COLUMN PEDESTAL- C7							212
COLUMN FOUNDATION - C8																	
19FE01	19	2.75	18	1	0.200	2.35					0.200		0.155				111
29FE02	29	2.49	12	17		0.5	1.99	0									101
13FE03	13	3.05	2	N2	0.255		2.545				0.255				0.81		6
19FE04	19	2.75	18	1	0.200	2.35					0.200		0.155				111
13FE05	13	0.64	9	S5		0.156	0.325		0.078			0.080					6
16F06	16	0.56	16	1	0.175	0.378					0		0.130				14
										TOTAL WEIGHT / COLUMN FOUNDATION - C8							349
COLUMN PEDESTAL - C8																	
29CE01	29	3.68	12	N1											3.68		223
13CE02	13	3.05	26	N2	0.255		2.545				0.255				0.81		79
										TOTAL WEIGHT / COLUMN PEDESTAL- C8							302
COLUMN FOUNDATION - C9																	
19FE01	19	2.31	36	N1											2.31		186
29FE02	29	2.49	8	17		0.5	1.99	0									101
13FE03	13	2.58	2	N2	0.255		2.073				0.255				0.66		5
										TOTAL WEIGHT / COLUMN FOUNDATION - C9							292
COLUMN PEDESTAL- C9																	
29CE01	29	3.65	8	N1											3.65		148
13CE02	13	2.58	25	N2	0.255		2.073				0.255				0.66		64
										TOTAL WEIGHT / COLUMN PEDESTAL- C9							212
WEST STAIR FOUNDATION - (TOP EL. +1.936)																	
16F01	16	3.550	8	TD5		0.300	2.050	0.430									44
16F02	16	2.175	2	17		0.300	1.875	0	0.770								7
16F03	16	3.005	8	17		0.300	1.875	0.830									37
16F04	16	3.178	2	17		0.300	2.048	0.830									10
16F05	16	2.440	20	N1											2.440		76
16F06	16	2.140	2	N1											2.140		7
										TOTAL WEIGHT / FOUNDATION (TOP EL. +1.936)							181

DENOTES CHANGES

NOTES:

1. ALL BAR DIMENSIONS ARE OUT TO OUT.
2. LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.



FIELD CHANGE

THIS SHEET SUPERSEDES SHEET 108
SEE SHEET NO. 93F2 FOR APPROVAL SIGNATURES

REVISIONS ONLY

EARTH TECH
A Science Applications International, Ltd. Company

BARBARA THAYER, P.C.
320 WEST 42ND STREET
NEW YORK, NEW YORK

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

BAR LIST 3 EAST
TOUCHDOWN AND WEST STAIR

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-27F1	JAN. 2002		EARTH TECH

ESTIMATED BY: FS CHECKED BY: JV
DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS
DESIGNED BY: OF, AS CHECKED BY: JV, FS
IN CHARGE OF: BT

M_YE
07/17/2002
L:\WORK\46090\CADD\FIELD CHANGE SHEETS\07-17-02\78BARLIST.DGN
L:_GENERAL\PLOTDRY\NYS DOT\NYSDOT11X17.PLT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		109	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

DESIGNED BY: GF, AS CHECKED BY: JV DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS ESTIMATED BY: FS CHECKED BY: JV, FS IN CHARGE OF: BT

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
WEST STAIR MID LANDING - SLAB (EL. +4.704)																	
16SE01	16	1.83	7	N1											1.83		20
13SE02	13	1.8	14	N1											1.8		25
13SE03	13	2.03	7	17		0.1	1.83	0.1									14
										TOTAL WEIGHT / SLAB (EL. +4.738)							59
WEST STAIR TOP LANDING - SLAB (EL. +7.645)																	
16SE01	16	1.83	7	N1											1.83		20
13SE02	13	1.8	14	N1											1.8		25
13SE03	13	2.03	7	17		0.1	1.83	0.1									14
										TOTAL WEIGHT / SLAB (EL. +7.645)							59
ELECTRIC PANEL ROOM - FOUNDATIONS																	
16F01	16	0.94	112	N1											0.94		163
16F02	16	0.63	5	N1											0.627		5
16F03	16	5.52	3	N1											5.524		26
16F04	16	2.25	4	N1											2.252		14
16F05	16	4.44	10	N1											4.442		69
16F06	16	8.49	5	10	0.64	7.21	0.64			B & R DIMENSIONS VARY						2.2965	66
13F07	13	1.13	132	17		0.2	0.93	0									148
										TOTAL WEIGHT / ELECTRIC ROOM - FOUNDATIONS							491
ELECTRIC PANEL ROOM - WALLS																	
13WE01	13	4.57	44	N1											4.57		200
13WE02	13	4.48	44	17		0	4.255	0.225									196
13WE03	13	0.78	46	17		0	0.645	0.135									36
16WE04	16	9.53	10	10	1.23	7.499	0.8									2.387	148
16WE05	16	8.94	10	10	1.23	6.905	0.8									2.198	139
16WE06	16	4.88	10	17		0	4.08	0.8									76
16WE07	16	4.1	10	N1											4.1		64
16WE08	16	4.8	10	N1											4.8		74
16WE09	16	6.38	10	17		0.8	4.775	0.8									99
16WE10	16	2.57	10	17		0	1.765	0.8									40
16WE11	16	1.78	10	N1											1.78		28
10WE12	10	9.21	1	10	1.23	7.499	0.48									2.387	5
10WE13	10	8.93	1	10	1.23	7.219	0.48									2.298	5
10WE14	10	4.56	1	17		0	4.08	0.48									3
10WE15	10	4.1	1	N1											4.1		2
10WE16	10	4.8	1	N1											4.8		3
10WE17	10	5.74	1	17		0.48	4.775	0.48									3
10WE18	10	2.25	1	17		0	1.765	0.48									1
10WE19	10	1.78	1	N1											1.78		1
16WE20	16	3.27	4	N1											3.27		20
16WE21	16	2.15	4	N1											2.15		13
13WE22	13	1.19	2	N1											1.19		2
13WE23	13	1.11	2	17		0	0.885	0.225									2
13WE24	13	1.32	4	N1											1.315		5
										TOTAL WEIGHT / ELECTRIC ROOM - WALLS							1165
ELECTRIC PANEL ROOM - SLAB																	
13SE01	13	4.89	24	N1						O' DIMENSION VARIES: 3.860 m - 5.920 m					4.89		117
13SE02	13	2.43	4	N1											2.43		10
13SE03	13	1.13	30	N1						O' DIMENSION VARIES: 0.600 m - 1.660 m					1.13		34
13SE04	13	4.22	18	N1											4.22		76
13SE05	13	1.66	20	N1											1.66		33
13SE06	13	2.41	10	N1						O' DIMENSION VARIES: 0.600 m - 4.220 m					2.41		24
13SE07	13	1.23	14	TD3		0.05	0.24	0.6			0.34	0.24		0.24			17
13SE08	13	1.7	10	N1											1.7		17
13SE09	13	1.35	4	N1											1.35		5
										TOTAL WEIGHT / ELECTRIC ROOM - SLAB							333

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
PLANTING BIN - WALLS																	
16W01	16	2.13	326	17		0	1.9	0.23									1078
16W02	16	2.58	156	17		0.45	1.9	0.23									625
16W03	16	2.36	170	17		0.23	1.9	0.23									623
13W04	13	9.95	40	N1											9.95		396
13W05	13	9.95	40	N1											9.95		396
13W06	13	12.95	10	17		0	12.15	0.8									129
13W07	13	12.5	10	17		0	12.15	0.35									124
13W08	13	12.95	10	17		0	12.15	0.8									129
13W09	13	12.5	10	17		0	12.15	0.35									124
13W10	13	15.06	10	17		0	14.26	0.8									150
13W11	13	14.61	10	17		0	14.26	0.35									145
13W12	13	15.06	10	17		0	14.26	0.8									150
13W13	13	14.61	10	17		0	14.26	0.35									145
13W14	13	4.5	20	17		0.8	2.9	0.8									89
13W15	13	3.6	20	17		0.35	2.9	0.35									72
13W16	13	1.66	80	T2	0.15	0.476	0.205	0.476	0.205		0.15						132
13W17	13	1.22	156	T2	0.15	0.256	0.205	0.256	0.205		0.15						97
										TOTAL WEIGHT / PLANTING BIN - WALLS							4604
PLANTING BIN - BEAMS																	
19B18	19	3.3	16	1	0.2	2.9					0.2		0.15				118
13B19	13	2.9	16	N1											2.9		46
19B20	19	4.72	16	S4	0.3	0.61	2.9	0.61			0.3						169
13B21	13	1.53	72	T2	0.15	0.231	0.386	0.231	0.386		0.15						110
										TOTAL WEIGHT / PLANTING BIN - BEAMS							443
FENCING WALL FW-1 - WALL																	
16W01	16	2.13	49	17		0.23	1.9	0									162
16W02	16	2.36	49	17		0.23	1.9	0.23									179
13W03	13	2.79	2	N1											2.79		6
13W04	13	12.34	2	N1											12.34		25
13W05	13	14.4	16	N1											14.4		229
13W06	13	12.17	2	17		0.63	11.54	0									24
13W07	13	2.62	2	17		0.63	1.99	0									5
										TOTAL WEIGHT / FENCING WALL FW-1 - WALL							630
FENCING WALL FW-2 - WALL																	
16W01	16	2.13	27	17		0.23	1.9	0									89
16W02	16	2.36	27	17		0.23	1.9	0.23									99
13W05	13	7.92	20	N1											7.92		157
										TOTAL WEIGHT / FENCING WALL FW-2 - WALL							345

NOTES:

1. ALL BAR DIMENSIONS ARE OUT TO OUT.
2. LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST 4 EAST TOUCHDOWN AND WEST STAIR

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
TD-28	DEC. 2000	NONE	

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		110	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

MARK	SIZE	LENGTH	NO REQ'D	TYPE	DETAIL DIMENSION A	B	C	D	E	F	G	H	J	K	O	R	WEIGHT
FENCING WALL FW-3 - WALL																	
16W01	16	2.13	13	17		0.23	1.9	0									43
16W02	16	2.36	13	17		0.23	1.9	0.23									48
16W03	16	1.98	6	17		0.23	1.75	0									18
16W04	16	2.21	6	17		0.23	1.75	0.23									21
16W05	16	2.28	14	17		0.23	2.05	0									50
16W06	16	2.51	14	17		0.23	2.05	0.23									55
16W07	16	1.995	1	17		0.23	1.765	0									3
16W08	16	2.225	1	17		0.23	1.765	0.23									3
13W09	13	6.56	4	N1											6.56		26
13W10	13	10.32	14	N1											10.32		144
13W11	13	10.56	2	17		0.63	9.93	0									21
13W12	13	3.69	2	N1											3.69		7
13W13	13	2.24	2	17		0.63	1.61	0									4
13W14	13	3.375	2	17		0.63	2.745	0									7
13W15	13	5.455	2	17		0.63	4.825	0									11
13W16	13	1.535	2	17		0.48	1.055	0									3
										TOTAL WEIGHT / FENCING WALL FW-3 - WALL							464
PLANTING ISLAND SITTING WALL SW-1 - WALL																	
16W01	16	2.13	51	17		0.23	1.9	0									169
16W02	16	2.58	51	17		0.23	1.9	0.45									204
13W03	13	14.97	20	N1											14.97		298
										TOTAL WEIGHT / ISLAND SITTING WALL SW-1 - WALL							671
PLANTING ISLAND SITTING WALL SW-2 - WALLS (INCLUDES 2 LOCATIONS)																	
16W01	16	2.13	28	17		0.23	1.9	0									92
16W02	16	2.58	28	17		0.23	1.9	0.45									112
13W03	13	4.36	20	9		4.36						1.206			3.386	1.792	86
13W04	13	3.33	20	9		3.33						0.923			2.595	1.374	66
										TOTAL WEIGHT / ISLAND SITTING WALL SW-1 - WALLS							356
PLANTING ISLAND SITTING WALL SW-3 - WALLS (INCLUDES 2 LOCATIONS)																	
16W01	16	2.13	62	17		0.23	1.9	0									204
16W02	16	2.58	62	17		0.23	1.9	0.45									248
13W03	13	9.23	20	9		9.23						0.769			9.129	13.944	184
13W04	13	8.95	20	9		8.95						0.745			8.855	13.526	178
										TOTAL WEIGHT / ISLAND SITTING WALL SW-3 - WALLS							814
FENCE POST FOOTING (INCLUDES 4 LOCATIONS)																	
13F01	13	0.65	24	N1											0.65	16	
10F02	10	1.321	24	N2	0.18		0.96				0.18				0.306	18	
										TOTAL WEIGHT/FENCE POST FOOTINGS							34
WEST APPROACH STAIR LANDING CURB																	
16W01	16	0.920	25	N1											0.920		36
13W02	13	2.370	5	N1											2.370		12
13W03	13	2.580	5	N1											2.580		13
13W04	13	1.620	5	N1											1.620		8
16W05	16	1.190	40	17		0.300	0.890	0.000									74
13W06	13	2.600	4	17		0.600	2.000	0.000									10
13W07	13	2.020	4	N1											2.020		8
13W08	13	2.810	4	17		0.600	2.210	0.000									11
13W09	13	2.230	4	N1											2.230		9
13W10	13	1.620	8	N1											1.620		13
										TOTAL WEIGHT/WTD STAIR LANDING CURB							194

NOTES:

1. ALL BAR DIMENSIONS ARE OUT TO OUT.
2. LENGTH OF BARS WITH VARIABLE DIMENSIONS ARE GIVEN AS AVERAGE LENGTH FOR ESTIMATING THE WEIGHT ONLY. THE CONTRACTOR SHALL DETAIL THE BARS FOR FABRICATION ACCORDING TO DETAILS DIMENSIONS.

AS-BUILT REVISIONS

SIGNATURE DATE

BAR LIST 5
EAST TOUCHDOWN

BARBARA THAYER, P.C.
330 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-29	DEC. 2000	NONE	EARTH TECH

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS ESTIMATED BY: FS CHECKED BY: JV DRAFTED BY: EL, RM, IV CHECKED BY: JV, FS

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	41	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

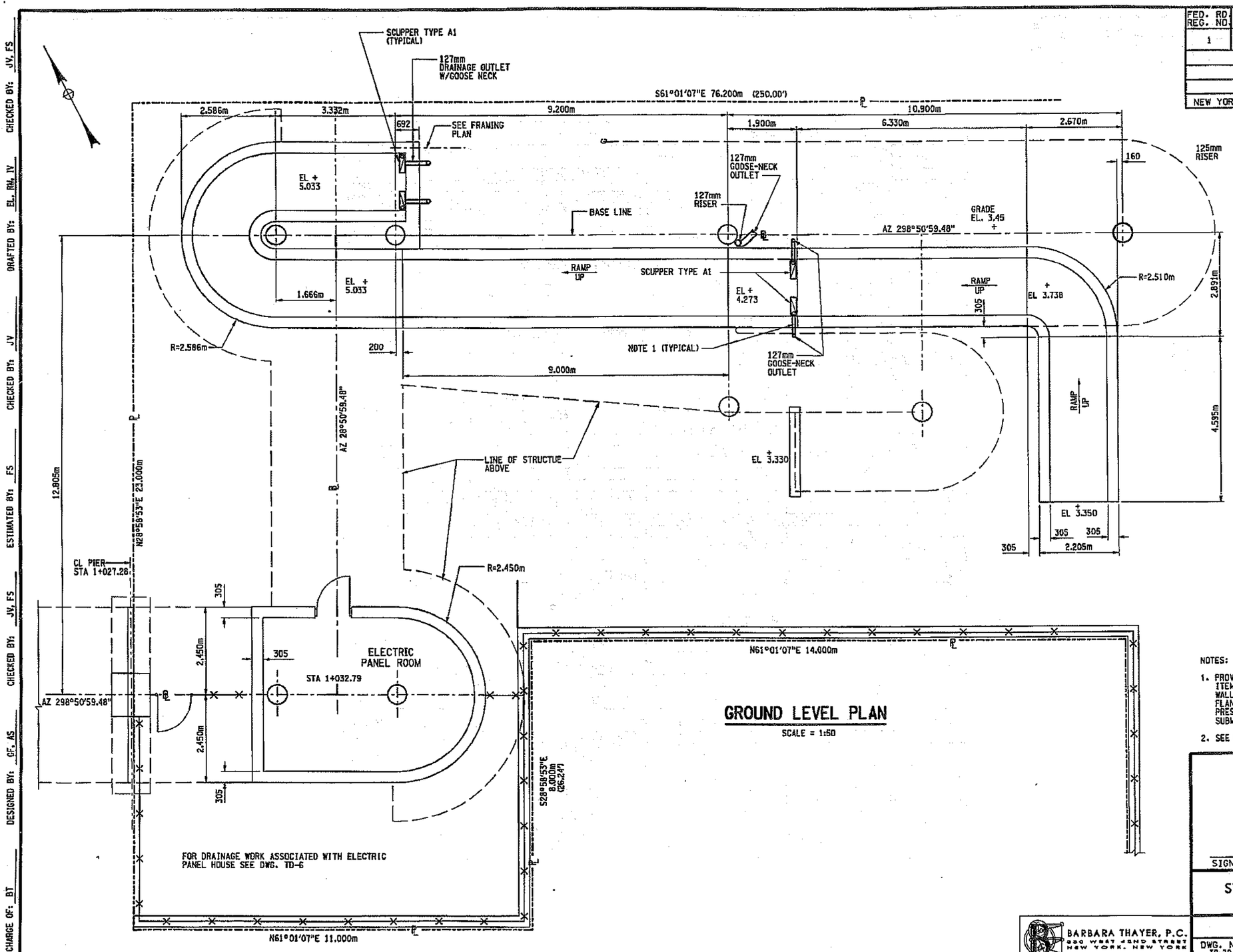
NEW YORK COUNTY — PIN: X024.22

DRAFTED BY: EL, RM, JV — CHECKED BY: JV, FS

ESTIMATED BY: FS — CHECKED BY: JV

DESIGNED BY: GF, AS — CHECKED BY: JV, FS

IN CHARGE OF: BT



GROUND LEVEL PLAN

SCALE = 1:50

NOTES:

1. PROVIDE WALL SLEEVE AND PIPE SEAL PAYABLE UNDER ITEM 555.0105W. CONCRETE. AT ALL PENETRATIONS. WALL SLEEVE SHALL BE 7mm THICK STEEL WITH INTEGRAL FLANGE. PIPE SEAL SHALL CONSIST OF RUBBER LINKS, PRESSURE PLATES AND FASTENERS. SUBMIT VENDORS CATALOG DATA FOR APPROVAL.
2. SEE DWG TD-31 FOR ADDITIONAL NOTES.

AS-BUILT REVISIONS

SIGNATURE _____ DATE _____

STORM DRAINAGE PLAN LOWER LEVEL EAST TOUCHDOWN

BARBARA THAYER, P.C.
350 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-30	DEC. 2000	AS SHOWN	EARTH TECH

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	112	142

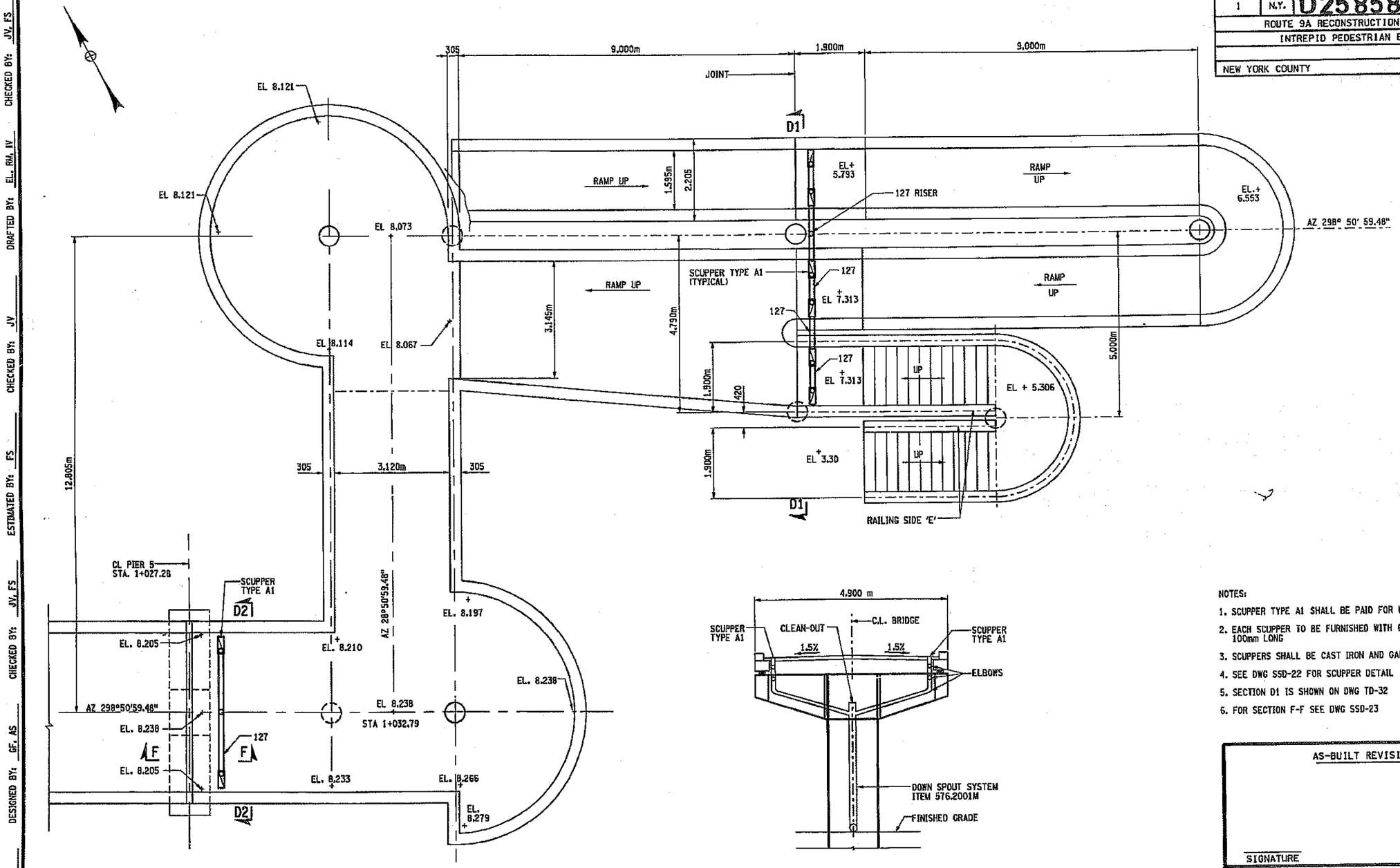
ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

ESTIMATED BY: FS CHECKED BY: JV
DESIGNED BY: GF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV CHECKED BY: JV, FS
IN CHARGE OF: BT



PLAN

SECTION D2-D2

NOTES:

1. SCUPPER TYPE A1 SHALL BE PAID FOR UNDER ITEM 576.01M
2. EACH SCUPPER TO BE FURNISHED WITH 6-M20 BOLTS, 100mm LONG
3. SCUPPERS SHALL BE CAST IRON AND GALVANIZED
4. SEE DWG SSD-22 FOR SCUPPER DETAIL
5. SECTION D1 IS SHOWN ON DWG TD-32
6. FOR SECTION F-F SEE DWG SSD-23

AS-BUILT REVISIONS

SIGNATURE DATE

STORM DRAINAGE PLAN AND SECTION UPPER LEVEL - EAST TOUCHDOWN

BARBARA THAYER, P.C.
880 WEST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-31	DEC. 2000	1:50	EARTH TECH

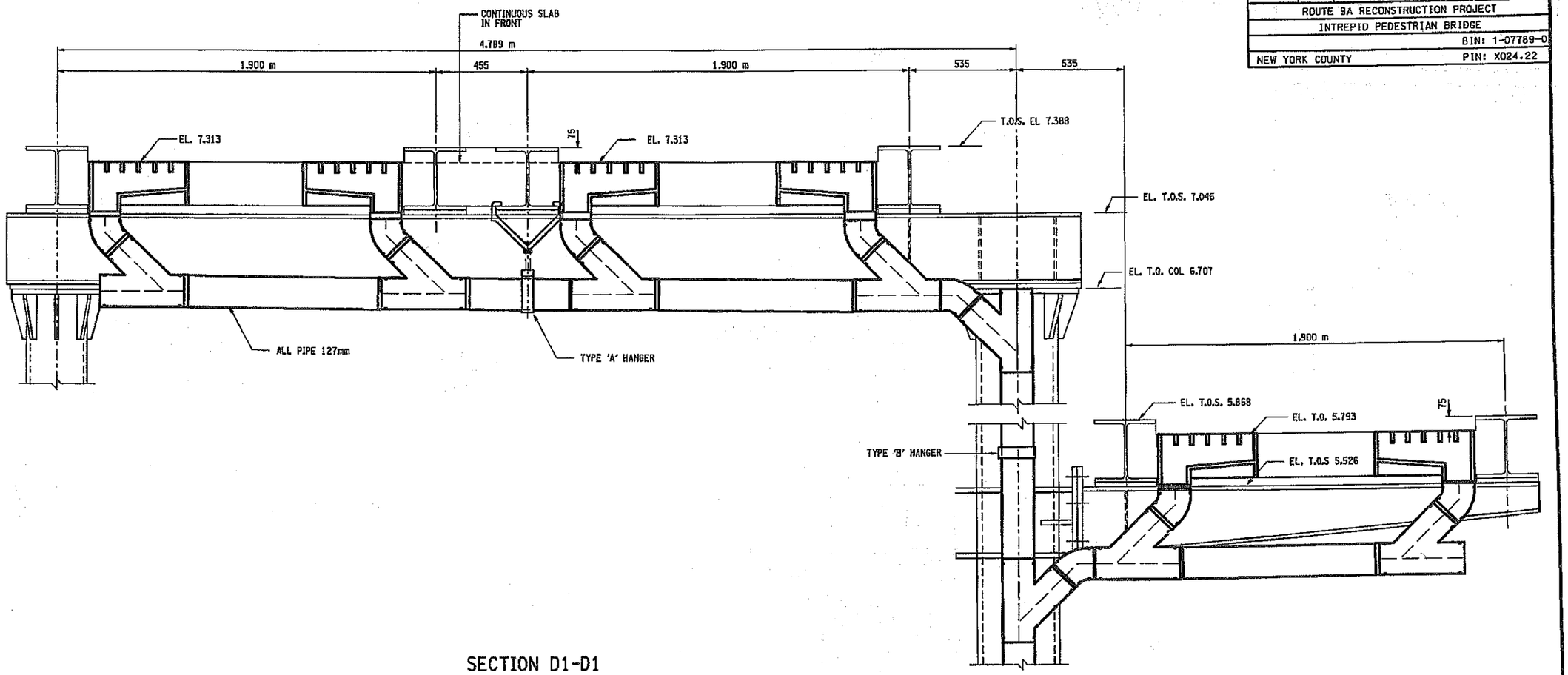
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	113	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22



SECTION D1-D1

SCALE 1:10

NOTES:

1. TYPE 'A' PIPE HANGER SHALL BE GALVANIZED BEAM CLAMP WITH EYENUTS, THREADED ROD, BOLTS AND PIPE CLAMP RATED FOR 2000 KG. SUBMIT VENDORS DATA SHOP DRAWINGS FOR APPROVAL (ITEM 576.2001M)
2. TYPE 'B' PIPE HANGER SHALL BE GALVANIZED STEEL PIPE CLAMP, BOLTS, STAND-OFFS AND ACCESSORIES RATED FOR 2000 KG. SUBMIT VENDORS DATA AND SHOP DRAWINGS FOR APPROVAL (ITEM 576.2001M)
3. ALL DRAINAGE WORK SHOWN ON THIS SHEET SHALL BE PAID UNDER ITEM 576.01M, SCUPPERS AND 576.2001M, DOWN SPOUTS.

AS-BUILT REVISIONS

SIGNATURE DATE

STORM DRAINAGE DETAILS EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-32	DEC. 2000	1 : 10	EARTH TECH

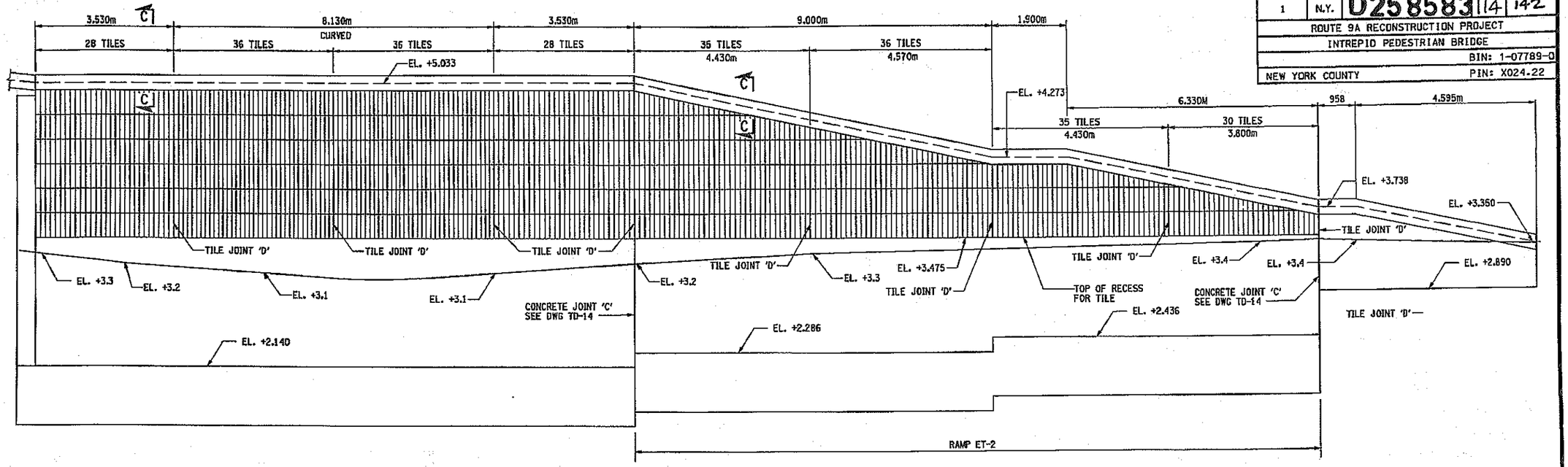
BARBARA THAYER, P.C.
200 WEST 42ND. STREET
NEW YORK, NEW YORK

IN CHARGE OF: BT DESIGNED BY: GF, AS CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV CHECKED BY: JV
ESTIMATED BY: FS

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	114	142

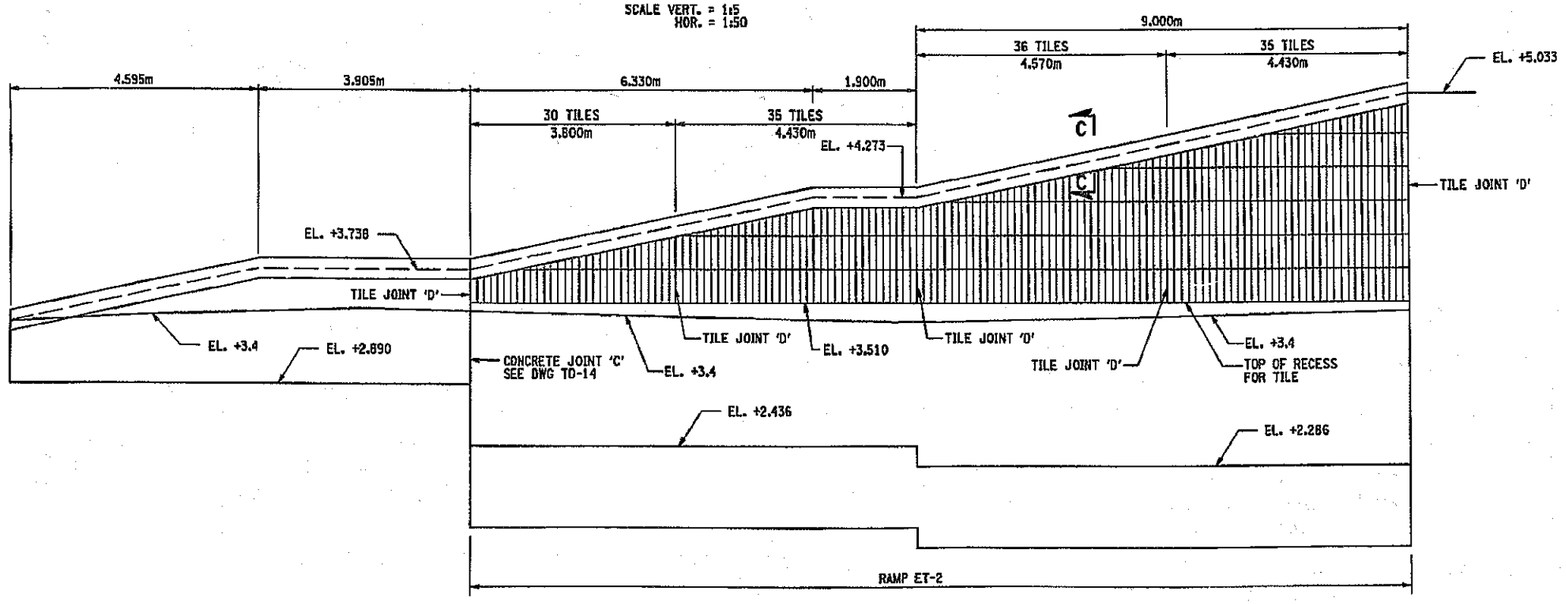
ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024-22

DESIGNED BY: GF, AS CHECKED BY: JV, FS ESTIMATED BY: FS
DRAFTED BY: EL, RM, IV CHECKED BY: JV
IN CHARGE OF: BT



DEVELOPED ELEVATION (SOUTH)

SCALE VERT. = 1:5
HOR. = 1:50



DEVELOPED ELEVATION (NORTH)

SCALE VERT. = 1:5
HOR. = 1:50

NOTES:

1. FOR SECTION C-C SEE DWG. TD-24
2. FOR JOINTS 'C' AND 'D' SEE DWG TD-14. TILE JOINT SHALL CONFORM TO REQUIREMENTS OF TILE COUNCIL OF AMERICAN STANDARD DETAIL FOR EXPANSION JOINT.
3. FOR CONDITION AT BOTTOM OF RECESS FOR CERAMIC TILE, SEE DETAIL 4 ON DWG. TD-14.

AS-BUILT REVISIONS

SIGNATURE DATE

DEVELOPED ELEVATIONS FOR CERAMIC TILE
EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
TD-33	DEC. 2000	AS SHOWN	EARTH TECH

BARBARA THAYER, P.C.
800 WEST 42ND STREET
NEW YORK, NEW YORK

0258583

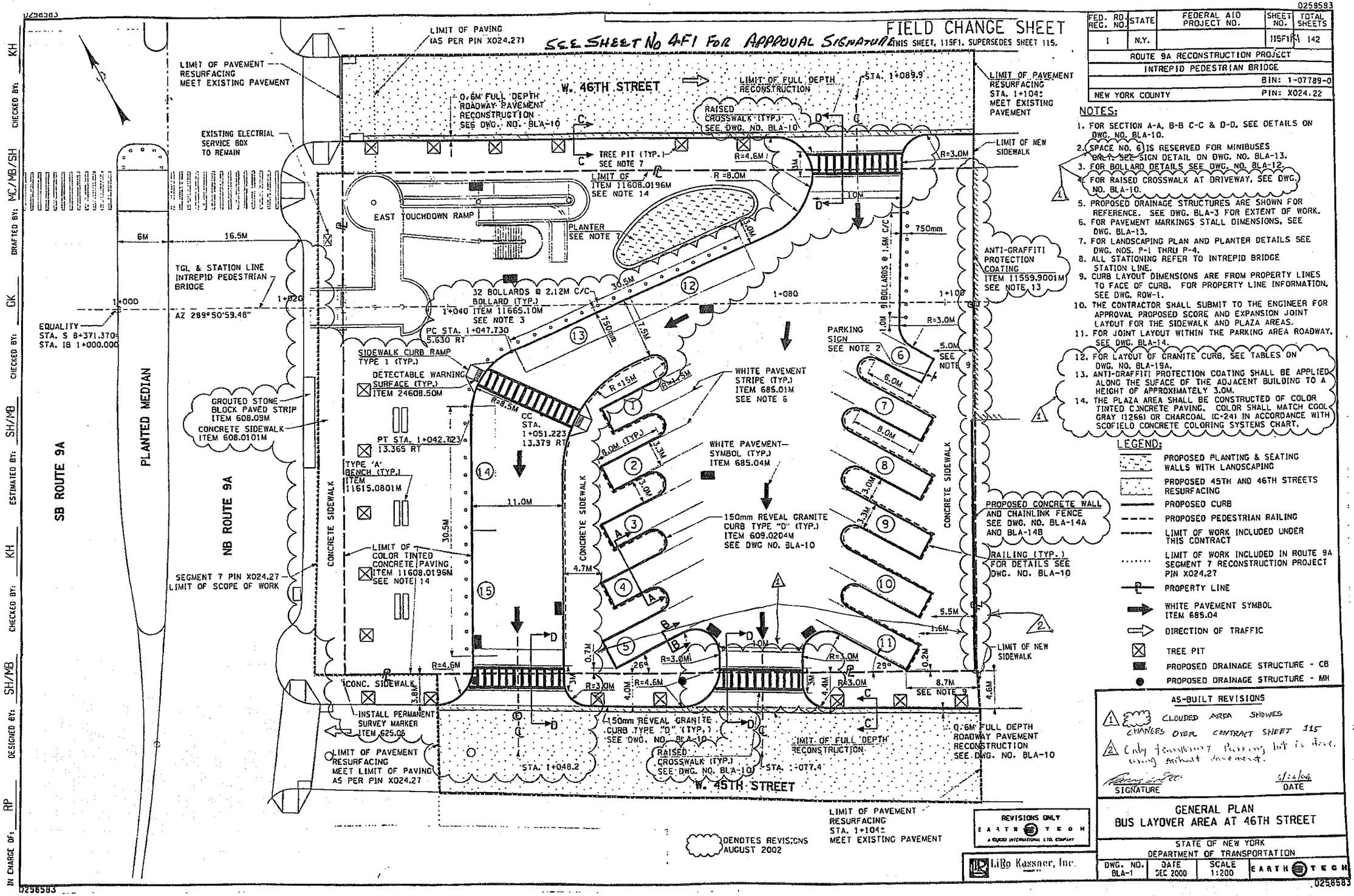
FIELD CHANGE SHEET

SEE SHEET No 4F1 FOR APPROVAL SIGNATURE. THIS SHEET, 115F1, SUPERSEDES SHEET 115.

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		115F1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY
PIN: X024.22

ESTIMATED BY: SH/MB CHECKED BY: KH
DESIGNED BY: SH/MB CHECKED BY: KH
DRAFTED BY: MC/MB/SH CHECKED BY: GK
IN CHARGE OF: RP



NOTES:

1. FOR SECTION A-A, B-B C-C & D-D, SEE DETAILS ON DWG. NO. BLA-10.
2. SPACE NO. 6 IS RESERVED FOR MINIBUSES ONLY. SEE SIGN DETAIL ON DWG. NO. BLA-13.
3. FOR BOLLARD DETAILS SEE DWG. NO. BLA-12.
4. FOR RAISED CROSSWALK AT DRIVEWAY, SEE DWG. NO. BLA-10.
5. PROPOSED DRAINAGE STRUCTURES ARE SHOWN FOR REFERENCE. SEE DWG. BLA-3 FOR EXTENT OF WORK.
6. FOR PAVEMENT MARKINGS STALL DIMENSIONS, SEE DWG. BLA-13.
7. FOR LANDSCAPING PLAN AND PLANTER DETAILS SEE DWG. NOS. P-1 THRU P-4.
8. ALL STATIONING REFER TO INTREPID BRIDGE STATION LINE.
9. CURB LAYOUT DIMENSIONS ARE FROM PROPERTY LINES TO FACE OF CURB. FOR PROPERTY LINE INFORMATION, SEE DWG. ROW-1.
10. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL PROPOSED SCORE AND EXPANSION JOINT LAYOUT FOR THE SIDEWALK AND PLAZA AREAS.
11. FOR JOINT LAYOUT WITHIN THE PARKING AREA ROADWAY, SEE DWG. BLA-14.
12. FOR LAYOUT OF GRANITE CURB, SEE TABLES ON DWG. NO. BLA-19A.
13. ANTI-GRAFFITI PROTECTION COATING SHALL BE APPLIED ALONG THE SUFACE OF THE ADJACENT BUILDING TO A HEIGHT OF APPROXIMATELY 3.0M.
14. THE PLAZA AREA SHALL BE CONSTRUCTED OF COLOR TINTED CONCRETE PAVING. COLOR SHALL MATCH COOL GRAY (1266) OR CHARCOAL (C-24) IN ACCORDANCE WITH SCOFIELD CONCRETE COLORING SYSTEMS CHART.

LEGEND:

- PROPOSED PLANTING & SEATING WALLS WITH LANDSCAPING
- PROPOSED 45TH AND 46TH STREETS RESURFACING
- PROPOSED CURB
- PROPOSED PEDESTRIAN RAILING
- LIMIT OF WORK INCLUDED UNDER THIS CONTRACT
- LIMIT OF WORK INCLUDED IN ROUTE 9A SEGMENT 7 RECONSTRUCTION PROJECT PIN X024.27
- PROPERTY LINE
- WHITE PAVEMENT SYMBOL ITEM 685.04
- DIRECTION OF TRAFFIC
- TREE PIT
- PROPOSED DRAINAGE STRUCTURE - CB
- PROPOSED DRAINAGE STRUCTURE - MH

DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1. CLOUDED AREA SHOWES CHANGES OVER CONTRACT SHEET 115
2. Only temporary Parking lot is desc. using Asphalt pavement.

SIGNATURE — DATE 5/24/04

REVISIONS ONLY
EARTH TECH
A AECOM INTERNATIONAL LTD. COMPANY

LiRo Kassner, Inc.

GENERAL PLAN
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-1	DEC 2000	1:200	EARTH TECH

0258583

FIELD CHANGE SHEET

THIS SHEET, 116FI, SUPERSEDES SHEET 116.

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		116FI	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

SEE SHEET No. 4FI FOR APPROVAL SIGNATURES

NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF WATER SUPPLY AND BUREAU OF GAS AND ELECTRICITY, CITY OF NEW YORK 72 HOURS PRIOR TO START OF WORK.
2. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING LIGHTING ASSEMBLIES AS INDICATED ON THE PLANS OR AS ORDERED BY THE ENGINEER. REMOVAL AND DISPOSAL OF THE OVERHEAD ELECTRIC WIRING SHALL BE PAID UNDER ITEM 670.81M.
3. ALL COORDINATION WITH CON EDISON AND LOCAL UTILITIES TO SECURE THE SITE, SPECIFICALLY THE DEACTIVATION OF ALL GAS LINES, ELECTRICAL POWER, PUMPS, COMPRESSORS AND TANKS PRIOR TO THE DEMOLITION AND REMOVAL OF SMALL STRUCTURES (ITEM 202.0101M) AND MISCELLANEOUS EQUIPMENT (ITEM 201.07M) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS UNLESS OTHERWISE NOTED.
4. DEMOLITION AND REMOVAL OF EXISTING CON EDISON ATTENDENT BOOTH AND SMALL METAL STORAGE BUILDING SHALL BE INCLUDED UNDER ITEM 202.0101M.
5. UNDER ITEM 201.07M, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL COMPRESSED NATURAL GAS (CNG) MISCELLANEOUS EQUIPMENT INCLUDING BUT NOT LIMITED TO, ABOVE GROUND PIPES, COMPRESSORS, VALVES, INSTRUMENTATION, GAGES, LARGE SIGN STRUCTURES, BOLLARDS, WOOD OR METAL POSTS, DEBRIS AND ALL MISCELLANEOUS STRUCTURES WITHIN THE LIMITS OF THE BUS LAYOVER AREA NOT COVERED UNDER OTHER CONTRACT ITEMS.
6. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT AN UNDERGROUND CONCRETE FOUNDATION EXISTS WITHIN THE LIMITS OF WORK AND THAT ITS PARTIAL REMOVAL WILL BE NECESSARY TO CONSTRUCT THE LAYOVER AREA TO THE LINES AND GRADES SHOWN ON DWG. NO. BLA-3. EXCAVATION OF THE FOUNDATION SHALL PROGRESS IN STAGES SIMULTANEOUSLY WITH EXCAVATION TO BRING THE SITE TO ROUGH GRADE TO MINIMIZE LARGE DEPTH DIFFERENTIALS ALONG THE LIMITS OF WORK. THE CONTRACTOR IS DIRECTED TO ANTICIPATE PERFORMING FOUNDATION EXCAVATION UNDER ITEMS 202.19M, 10520.05M & 203.07M.
7. BELL ATLANTIC PERSONNEL WILL REMOVE ALL EXISTING BELL ATLANTIC TELEPHONE ASSEMBLIES WITHIN THE BUS LAYOVER LIMITS. THE CONTRACTOR SHALL NOTIFY BELL ATLANTIC AT (718) 403-7000 AT LEAST TWO WEEKS PRIOR TO START OF WORK.
8. THE CONTRACTOR SHALL PERFORM CUT BACK OF EXISTING SIDESLOPE AS DETAILED ON DWG. BLA-13. ALL WORK SHALL BE PERFORMED WITHIN SHOWN TEMPORARY EASEMENT EXCEPT REMOVAL OF STEEL BAR AND POST FENCE DESIGNATING THE EQUIPMENT STORAGE AREA. THE LIMIT OF THIS FENCE REMOVAL SHALL EXTEND TO THE EXPOSED STEEL SHEETING. CUT BACK OF EXISTING SIDESLOPE SHALL BE PAID FOR UNDER ITEM 203.02M. N.I.C.

AS-BUILT REVISIONS

1 CLOUDED AREA SHOWS CHANGES SHEET # 116

2 Certified as Built plan is not to scale No bench mark used

SIGNATURE — DATE

DEMOLITION PLAN
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-2	DEC 2000	1:200

EARTH TECH

REVISIONS ONLY
EARTH TECH
A TETRA TECH INTERNATIONAL LTD. COMPANY

LiRo-Kassner, Inc.

DENOTES REVISIONS AUGUST 2002

LEGEND:

× DEMOLITION OF EXISTING OVERHEAD WIRING AND UTILITY POLES

PROPERTY LINE

UNDERGROUND CONCRETE TANK FOUNDATION (LIMITS APPROXIMATED)

LIMIT OF WORK

W. 46TH STREET

W. 45TH STREET

SB ROUTE 9A

NB ROUTE 9A

PLANTED MEDIAN

TGL & STATION LINE INTREPID PEDESTRIAN BRIDGE

NATURAL GAS PUMP STATION

REMOVE (1) SIGN ITEM 647.06M

REMOVE EXISTING CONCRETE SIDEWALK ITEM 203.02M

REMOVE EXISTING CURB ITEM 203.02M

REMOVE SIGN STRUCTURE ITEM 201.07M

SAW CUTTING EXISTING PAVEMENT ITEM 10520.05M

EXISTING GAS VALVES TO REMAIN

SAW CUTTING EXISTING SIDEWALK ITEM 10520.05M

REMOVE CONDENSATION TRAP ASSEMBLY ITEM 201.07M

REMOVE AND DISPOSE OF LAMP POST ASSEMBLY ITEM 670.81M
REMOVE LAM POST FOUNDATION ITEM 670.82M

REMOVE AND DISPOSE OF CHAIN LINK FENCE AND GATE ITEM 11607.21M

REMOVE AND DISPOSE OF EXISTING BOLLARDS (TYP.) SEE NOTE 5 ITEM 201.07M

REMOVE AND DISPOSE OF LAMP POST ASSEMBLY ITEM 670.81M
REMOVE LAMPOST FOUNDATION ITEM 670.82M SEE NOTE 2

EXCAVATE TO THE BOTTOM OF PROPOSED SUBBASE ITEM 203.02M

REMOVE AND DISPOSE OF CHAIN LINK FENCE ITEM 11607.21M
REMOVE EXISTING WALL ITEM 203.02M

SAW CUTTING EXISTING SIDEWALK ITEM 10520.05M

REMOVE AND DISPOSE OF LAMP POST ASSEMBLY (TYP.) ITEM 670.81M
REMOVE LAMP POST FOUNDATION (TYP.) ITEM 670.82M

EXCAVATE TO THE BOTTOM OF PROPOSED SUBBASE ITEM 203.02M

REMOVE AND DISPOSE OF CHAIN LINK FENCE ITEM 11607.21M
REMOVE EXISTING WALL ITEM 203.02M

REMOVE ABANDONED DRAINAGE STRUCTURES SEE DWG. NO. BLA-8 FOR PAY ITEMS AND DETAILS

REMOVE ABANDONED ELECT. ENCLOSURE ITEM 11662.80M

6'0, 40" HIGH BOLLARDS (TYP.)

ITEMS 11202.20M, 11202.21M, 11202.30M, AND 11203.32M (TYP. ENTIRE PROJECT AREA)

REMOVE AND DISPOSE OF LAMP POST ASSEMBLY (TYP.) ITEM 670.81M
REMOVE LAMPOST FOUNDATION (TYP.) ITEM 670.82M SEE NOTE 2

REMOVE EXISTING CONCRETE ITEM 203.02M

REMOVE AND DISPOSE OF STEEL BAR AND POST FENCE, INCLUDE UNDER ITEM 201.07M

REMOVE AND DISPOSE OF FLAG POLE, SEE NOTE 5 ITEM 201.07M

EXISTING HYDRANT AND GAS VALVES TO REMAIN

REMOVE EXISTING STONE WALL ITEM 203.02M

SAW CUTTING EXISTING PAVEMENT ITEM 10520.05M

REMOVE EXISTING CURB ITEM 203.02M

REMOVE EXISTING CONCRETE SIDEWALK ITEM 203.02M

REMOVE AND DISPOSE OF SLIDING CHAIN LINK FENCE GATE ITEM 11607.21M

REMOVE AND DISPOSE OF STEEL PLATE WALL, INCLUDE UNDER ITEM 201.07M

REMOVE EXISTING STRUCTURAL CONCRETE ITEM 203.02M

REMOVE CONCRETE DROP CURB, RAMP, AND SIDEWALK ITEM 203.02M

REMOVE EXISTING WALL ITEM 203.02M

REMOVE AND DISPOSE OF CHAIN LINK FENCE ITEM 11607.21M
REMOVE EXISTING WALL ITEM 203.02M

LIMIT OF WORK DONE UNDER SEGMENT 7 PIN X024.27

REMOVE AND DISPOSE OF LAMP POST ASSEMBLY (TYP.) ITEM 670.81M
REMOVE LAMP POST FOUNDATION (TYP.) ITEM 670.82M

EXCAVATE TO THE BOTTOM OF PROPOSED SUBBASE ITEM 203.02M

REMOVAL OF SUBSTRUCTURE (TO 20.05M, 20.30M) ITEM 202.19M SEE NOTE 6

SEE NOTES 3&4

SEE NOTES 3,4,5

SEE NOTES 3&5

SEE NOTE 5

ELECTRICAL SERVICE BOX WITH SECONDARY SERVICE TO SITE TO REMAIN

4' HIGH GUARD RAIL

TIMBER CURB (POOR)

PARKING

SAND STORAGE AREA

STEEL ENCLOSURE

EQUIPMENT STORAGE AREA

OPEN

STEEL BAR AND POST FENCE

CONC. SIDEWALK

DROP CURB

GRAVEL

ASPHALT

METAL BLDG.

BRICK BLDG.

CONC.

TRENCH DRAIN

BOOTH

GATE

POST

FLAG

SLIDING GATE

O.H. ELEC.

8+357.3 RTE 9A

4.8M± @ STA. 1+074

0.6M (TYP.)

5.2M±

DESIGNED BY: SH/MB — CHECKED BY: KH
DRAFTED BY: MC/MB/SH — CHECKED BY: CK
ESTIMATED BY: SH/MB — CHECKED BY: KH
IN CHARGE OF: RP

USER
DECEMBER 2000
X024228B.WK2

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		117F1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

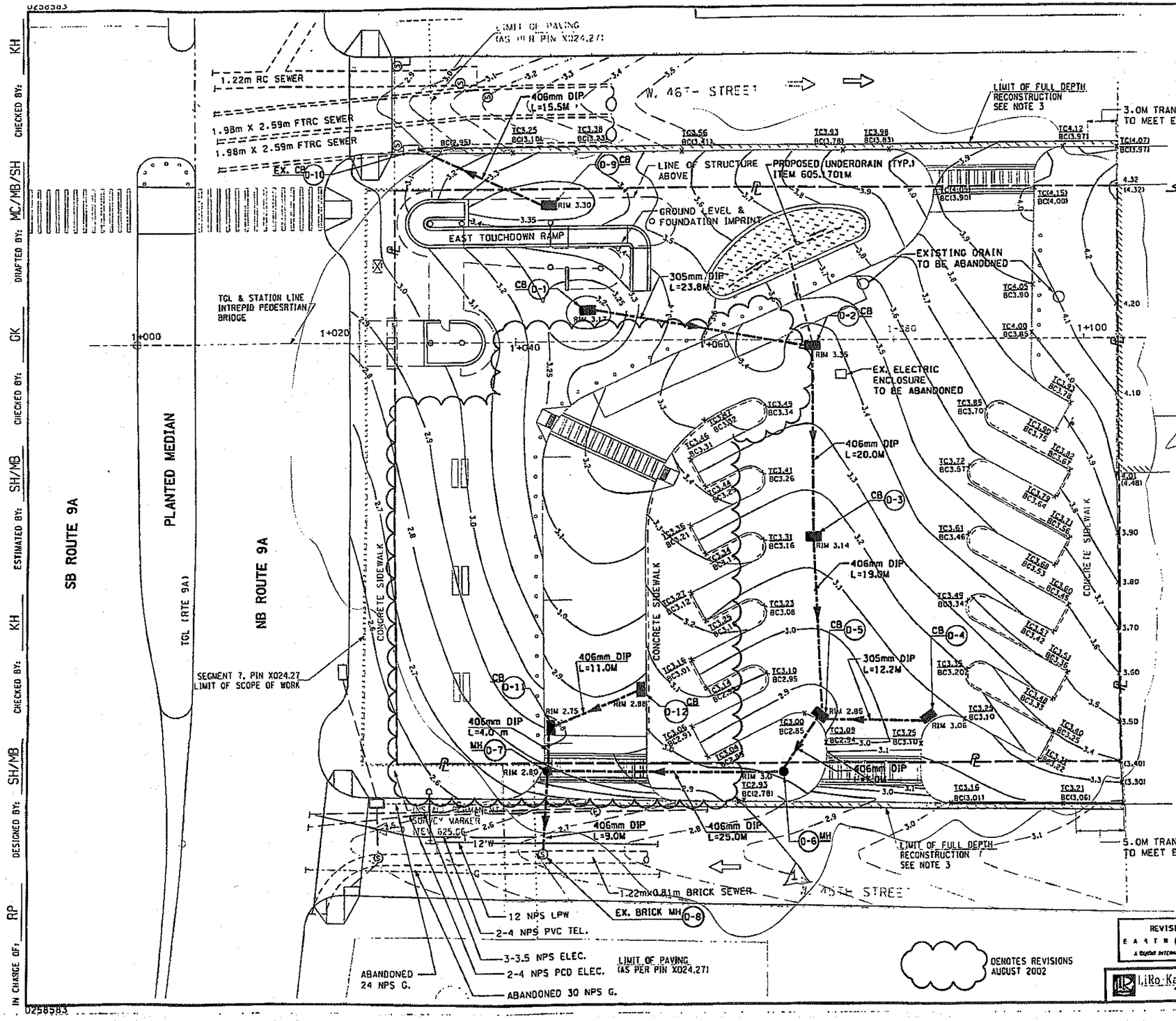
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 117F1, SUPERSEDES SHEET 117.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURE



NOTES:

1. CONTOURS 3.25M & 3.35M IN THE AREA OF THE EAST TOUCHDOWN RAMP ARE SHOWN FOR CLARITY.
2. REFER TO DRAWING NO. BLA-19B FOR TABLE OF PROPOSED DRAINAGE STRUCTURES.
3. FOR PAVEMENT RECONSTRUCTION OF THE LAYOVER AREA AND RESURFACING OF 45TH & 46TH STREETS, SEE DWG. BLA-1.
4. FOR ISOLATION JOINTS AROUND DRAINAGE STRUCTURES, SEE DETAILS ON DWG. BLA-7.

DRAINAGE LEGEND:

- EXISTING DRAINAGE STRUCTURE - CATCH BASIN
- EXISTING DRAINAGE STRUCTURE - MANHOLE
- PROPOSED DRAINAGE STRUCTURE - CATCH BASIN TYPE 2
- PROPOSED DRAINAGE STRUCTURE - MANHOLE TYPE A-1
- EXISTING DRAINAGE PIPE
- PROPOSED DRAINAGE PIPE WITH DIRECTION OF FLOW
- PROPOSED UNDERDRAIN WITH DIRECTION OF FLOW
- (D-1) ID NO. OF DRAINAGE STRUCTURE
- 3.1 PROPOSED CONTOUR
- 3.1 EXISTING CONTOUR
- DIRECTION OF TRAFFIC
- TC3.60 / BC3.45 PROPOSED TOP OF CURB ELEVATION / PROPOSED BOTTOM OF CURB ELEVATION
- TC(3.19) / BC(3.14) EXISTING TOP OF CURB ELEVATION / EXISTING BOTTOM OF CURB ELEVATION

AS-BUILT REVISIONS

1. CLOUDED AREA DENOTES REVISION OVER SHEET # 117
2. Temporary asphalt paved for Intrepid Opening.

SIGNATURE — DATE 5/16/03

REVISIONS ONLY — EARTH TECH, A CDM INTERNATIONAL LTD. COMPANY

LiRo-Kassner, Inc.

GRADING AND DRAINAGE PLAN BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-3	DEC 2000	1:200	EARTH TECH

IN CHARGE OF: RP — DESIGNED BY: SH/MB — CHECKED BY: SH/MB — DRAFTED BY: MC/MB/SH — CHECKED BY: GK — ESTIMATED BY: KH — CHECKED BY: KH

D258583

D256583

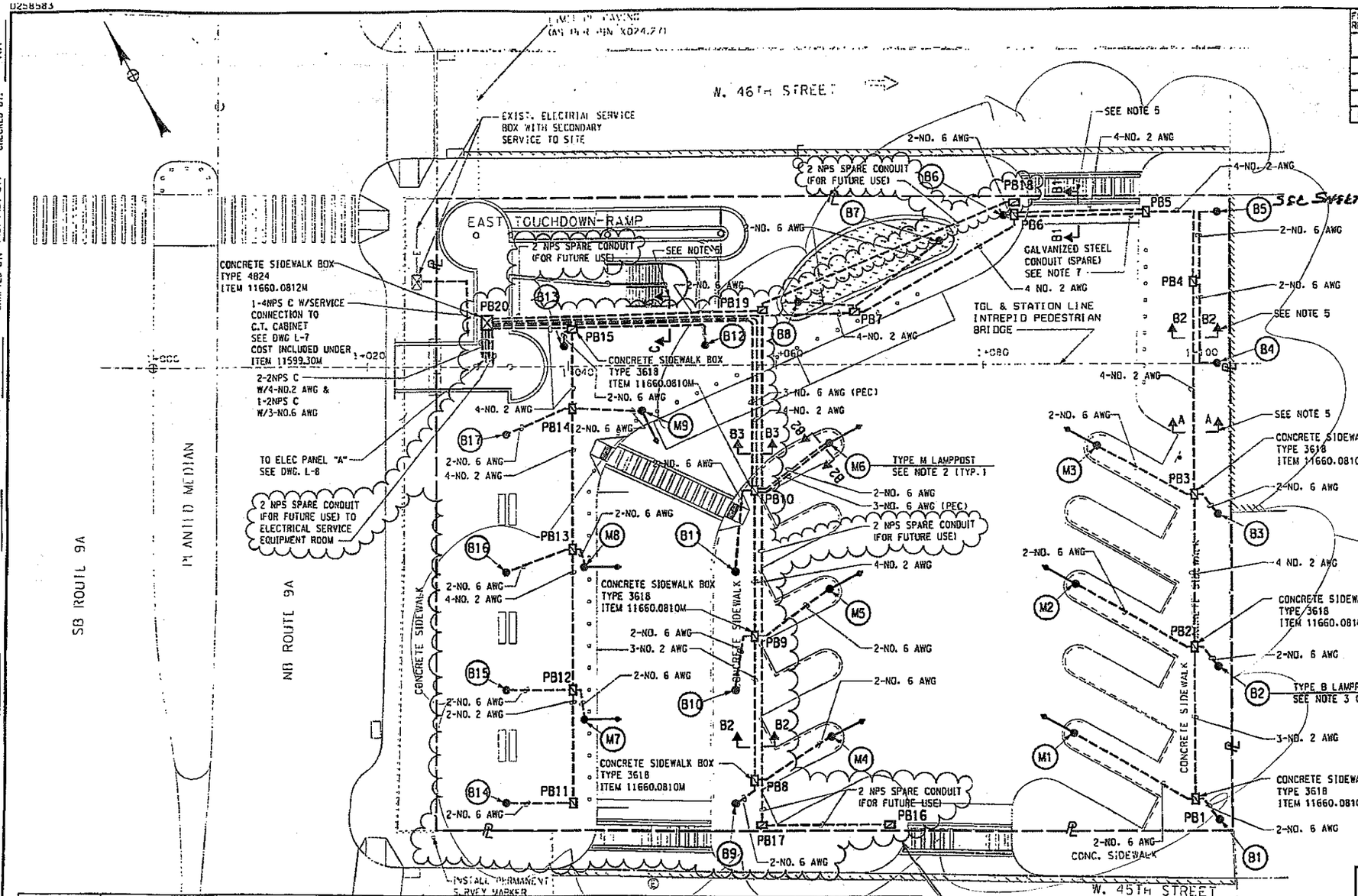
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		118F1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY — PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 118F1, SUPERSEDES SHEET 118.

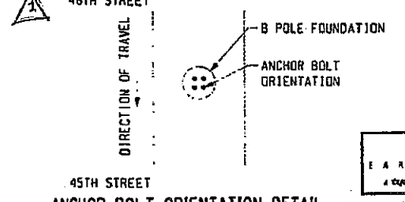
SEE SHEET NO. 4 F1 FOR APPROVAL SIGNATURES



ITEM NO.	DESCRIPTION	UNIT
10206.0301M	CONDUIT EXCAVATION & BACKFILL (RESTORING TOP SURFACE NOT INCLUDED)	M
11660.0106M	CONDUIT, HOT DIPPED GALV. STEEL PIPE - 2 N.P.S.	M
11660.0810M	CONCRETE SIDEWALK BOX TYPE 3618	EA.
11660.0812M	CONCRETE SIDEWALK BOX TYPE 4824	EA.
11661.0305M	INSULATED CONDUCTOR NO. 6 AWG	M
11661.0306M	INSULATED CONDUCTOR NO. 2 AWG	M
670.0111M	FOUNDATION FOR LIGHTPOLE, NYCDOT TYPE B	EA.
670.0112M	FOUNDATION FOR LIGHTPOLE, NYCDOT TYPE M	EA.
11670.1080M	TYPE M LAMPPOST, 7.75M MOUNT HEIGHT W/3.05 ARM	EA.
11670.1593010M	TYPE B-12 LAMPPOST	EA.
11670.5110M	LUMINAIRE, 250W HPS, TEARDROP	EA.
11670.5117M	100W HPS LUMINAIRE W/BUILT IN BALLAST	EA.

NOTES

1. SEE DWG. BLA-19 FOR TABLE OF PROPOSED BUS LAYOVER AREA LIGHTING WORK.
2. TYPE M LAMPPOST: ITEMS 670.0112M, 11670.1080M, ITEM 11670.5110M
   TYPE B LAMPPOST: ITEM 670.0111M, ITEM 11670.1593010M, ITEM 11670.5117M
   (SEE TYPE B ORIENTATION DETAIL THIS SHEET)
3. FOR THE REMOVAL OF EXISTING LIGHTPOLES/UTILITY POLES SEE DWG. BLA-2.
4. FOR TRENCHING DETAILS A-A, B1-B1, B2-B2, C-C, SEE BLA-13.
5. ALL WIRING SHALL BE INSTALLED IN HOT DIPPED GALVANIZED STEEL CONDUIT.
6. 2 N.P.S. ITEM 11668.2106M.
7. ALL SPARE CONDUITS SHALL BE INSTALLED WITH DRAG WIRE.
8. FOR ELECTICAL/LIGHTING WORK INVOLVING THE RELOCATION OF TYPE M LAMP POST ALONG N/B ROUTE 9A, SEE DWG. DU-4.



ANCHOR BOLT ORIENTATION DETAIL FOR TYPE B LAMPPOST

AS-BUILT REVISIONS

1 EMB CLOUDED AREA DENOTES REVISION. OVER CONTRACT SHEET # 118

2 No lighting installed in temporary Parking lot.

SIGNATURE — DATE 5/6/04

REVISIONS ONLY
EARTH TECH
A CH2M HILL COMPANY

LiRo Kassner, Inc.

STREET LIGHTING PLAN
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-4	DEC 2000	1:200	EARTH TECH

ESTIMATED BY: SH/MB — CHECKED BY: KH
DRAFTED BY: MC/MB/SH — CHECKED BY: GK
DESIGNED BY: SH/MB — CHECKED BY: KH
IN CHARGE OF: RP

DECEMBER 2000
X024221A.UTL

D256583

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		119F1	R 142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY — PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 119F1, SUPERSEDES SHEET 119.

See Sheet No. 4F1 For Approval Signatures

DESIGNED BY: SH/MB — CHECKED BY: KH — ESTIMATED BY: SH/MB — CHECKED BY: GK — DRAFTED BY: MC/MB/SH — CHECKED BY: KH

IN CHARGE OF: RP

DECEMBER 21000
X024228.UTL

W. 46TH STREET

1.22m RC SEWER
1.98m X 2.59m FTRC SEWER
1.98m X 2.59m FTRC SEWER
12 NPS LPW SEE NOTE 7
2 NPS STEEL WATER PIPE & TAP TO EXISTING WATERMAIN SEE NOTE 7
PLANTER "B" SEE NOTE 4
QUICK COUPLER VALVE IN CONC. BOX
EAST TOUCHDOWN RAMP
DRAIN TO DRYWELL SEE NOTE 3
PROPOSED PULLBOX AND CONDUIT SEE NOTE 6
TGL & STATION LINE INTREPID PEDESTRIAN BRIDGE
1+000
1+020
1+040
1+060
1+080
1+100
SEE NOTE 6
HOSE BIB
1.5 NPS P.V.C. WATER PIPE
DRYWELL
SLOPE PIPE TO DRYWELL
PLANTED MEDIAN
SB ROUTE 9A
NB ROUTE 9A
CONCRETE SIDEWALK
CONCRETE SIDEWALK
CONCRETE SIDEWALK
PROPOSED DRAINAGE SEE NOTE 5
LIMIT OF WORK DONE UNDER SEGMENT 7 PIN X024.27
INSTALL PERMANENT SURVEY MARKER ELEV. 625.06
12"W
MEET EXISTING PAVEMENT
1.22mx0.81m BRICK SEWER
W. 45TH STREET
12 NPS LPW
2-4 NPS PVC TEL.
3-3.5 NPS ELEC.
2-4 NPS PCD ELEC.
ABANDONED 24 NPS G.
ABANDONED 30 NPS G.
DENOTES REVISIONS AUGUST 2002

NOTES

1. FOR IRRIGATION DETAILS SEE DWG. NOS. BLA-15 THRU BLA-18.
2. IRRIGATION LEGEND IS LOCATED ON DWG. NO. BLA-15.
3. DRAIN VALVES TO BE LOCATED ON THE DOWN SIDE OF THE IRRIGATION WATER LINE (TYPICAL FOR ALL).
4. SEE DWG. NO. BLA-15 FOR PLANTER "B" ENLARGED PLAN AND LAYOUT.
5. SEE DWG. NO. BLA-3 FOR GRADING AND DRAINAGE PLAN.
6. SEE DWG. NO. BLA-4 FOR LIGHTING PLAN.
7. LOCATION OF EXISTING WATERMAIN IS ASSUMED. CONTRACTOR SHALL FIELD VERIFY PRIOR TO INSTALLATION OF IRRIGATION PIPING.

AS-BUILT REVISIONS

1 CLOUDED AREA DENOTES REVISION. OVER CONTRACT SHEET # 119

2 No permanent irrigation installed in this temporary parking lot.

SIGNATURE — DATE

REVISIONS ONLY
EARTH TECH
A TYDEC INTERNATIONAL LTD. COMPANY

LiRo Kassner, Inc.

IRRIGATION PLAN
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-5	DEC 2000	1:200	EARTH TECH

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	120	142

ROUTE 9A RECONSTRUCTION PROJECT

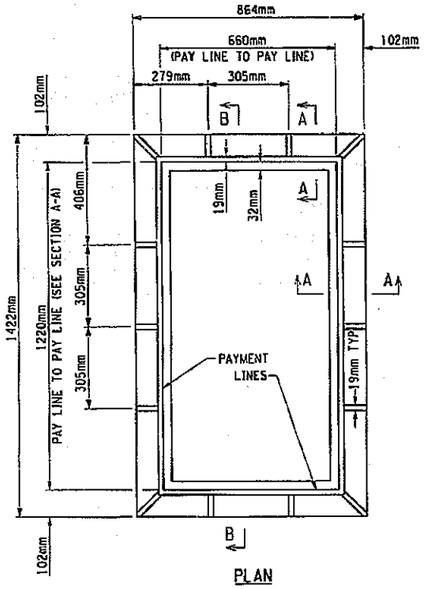
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

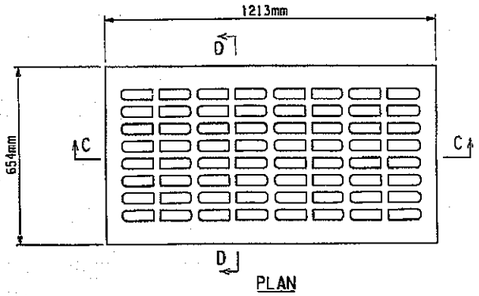
ESTIMATED BY: SH/MB CHECKED BY: KH DRAFTED BY: MC/MB/SH CHECKED BY: GK DESIGNED BY: SH/MB CHECKED BY: KH IN CHARGE OF: RP

USER MAY 2000 DDT X02422A.



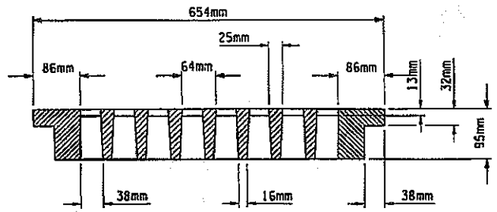
PLAN

TYPE S.C. FRAME

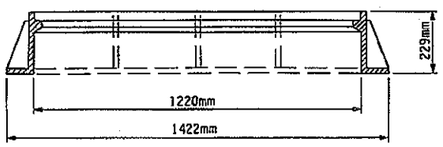


PLAN

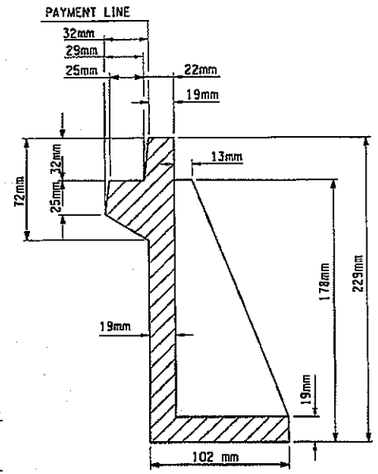
NYC DEP STANDARD CAST IRON GRATING



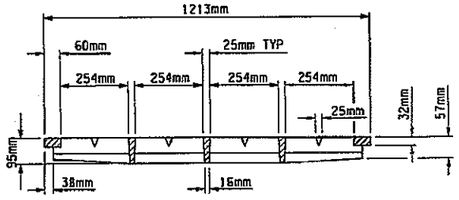
SECTION D-D



SECTION B-B



SECTION A-A



SECTION C-C

FRAME AND GRATE

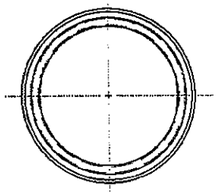
ITEM 655.0101 M

ITEM *	DESCRIPTION	UNIT
655.0101M	FRAMES AND GRATES (CASTINGS)	m^2
656.01M	MISCELLANEOUS METALS	kg

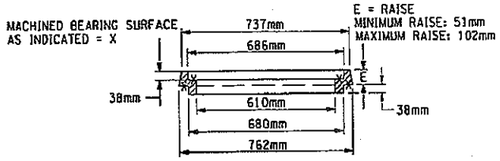
NOTES

1. THE GRATE (THE FRAME IS A REGION 1) STANDARD) IS A STANDARD OF THE N.Y.C. DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF WATER AND SEWER OPERATIONS.
2. BOTTOM OF FRAME CASTINGS SHALL BE SET LEVEL OR SLOPED AS ORDERED BY THE ENGINEER.
3. THE EXTENSION FRAME & THE EXTENSION RING WILL BE PAID FOR UNDER THE ITEM FOR MISC. METALS. PAINTING SHALL NOT BE REQUIRED.
4. APPROVED SHOP DRAWINGS WILL BE REQUIRED FOR ALL DETAILS SHOWN ON THIS SHEET.

DESIGN LOADING: HS20-44 HIGHWAY LOADING



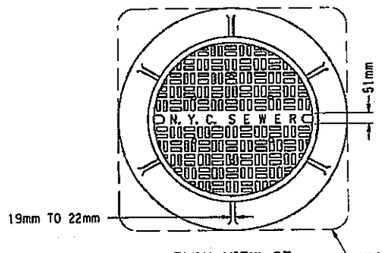
PLAN VIEW



SECTION VIEW

SOLID EXTENSION RING

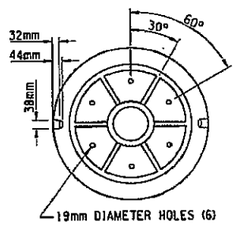
ITEM 656.01M



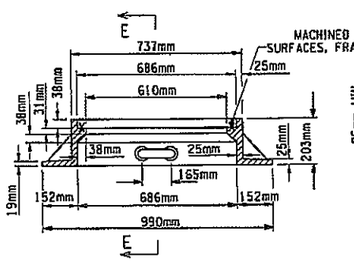
PLAN VIEW OF

FRAME AND COVER

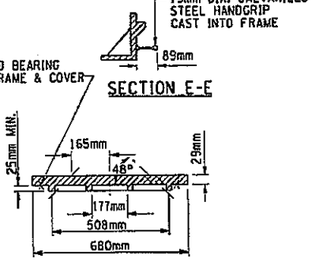
USE SQUARE BASE OVER SQUARE OPENING



BOTTOM VIEW OF COVER



SECTION OF FRAME



SECTION OF COVER

MANHOLE FRAME AND COVER

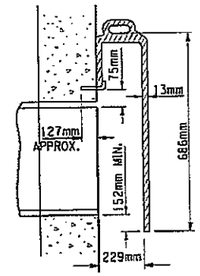
ITEM 655.0101 M

NOTES

5. FITTING EXTENSION FRAMES OR RINGS ON EXISTING CASTINGS MAY REQUIRE MINOR GRINDING OR CUTTING OF THE EXISTING FRAME, CURB BOX, CONCRETE CURB OR PAVEMENT.
6. ALL EXTENSION FRAMES OR RINGS SHALL BE SEATED IN AN EPOXY COMPOUND SPECIFICALLY FORMULATED FOR THAT PURPOSE, SUCH AS SYLVAX 818 OR EQUAL. THE PRODUCT SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
7. NO SEPARATE PAYMENT FOR WORK OR MATERIALS CALLED FOR IN NOTES 5. & 6. COST TO BE INCLUDED IN THE PRICE BID FOR THE EXTENSION FRAMES OR RINGS.

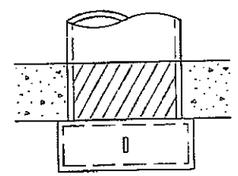
NOTES

8. MATERIAL: GRAY CAST IRON ASTM A-48-83 CLASS30B.
9. ALL MANHOLE FRAMES, COVERS & EXTENSION RINGS, AND CATCH BASIN FRAMES, GRADES & HOODS SHALL HAVE THE INITIALS OF THE MANUFACTURER'S NAME, THE DATE OF MANUFACTURE AND THE INITIALS OF THE PLANT OF MANUFACTURE INTEGRALLY CAST ON THEM AT THE TIME OF MANUFACTURE IN ACCORDANCE WITH THE SPECIFICATIONS.



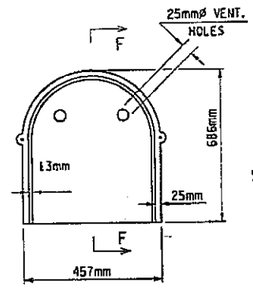
SECTION F-F

HOOD IN PLACE

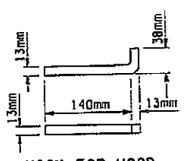


PLAN OF

HOOD IN PLACE



FRONT ELEVATION OF HOOD



HOOK FOR HOOD

(2 REQUIRED)

CAST IRON HOOD FOR OUTLETTING PIPE

PAYMENT AS MISCELLANEOUS METALS (ITEM 656.01M)

AS-BUILT REVISIONS

SIGNATURE DATE

LiRo-Kassner, Inc.

DRAINAGE DETAILS - 1

BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK

DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-6	DEC 2000	N.T.S.	EARTH TECH

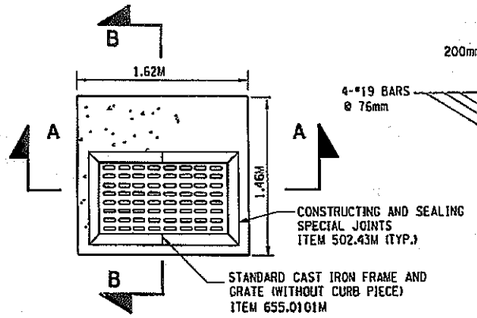
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	121	142

ROUTE 9A RECONSTRUCTION PROJECT

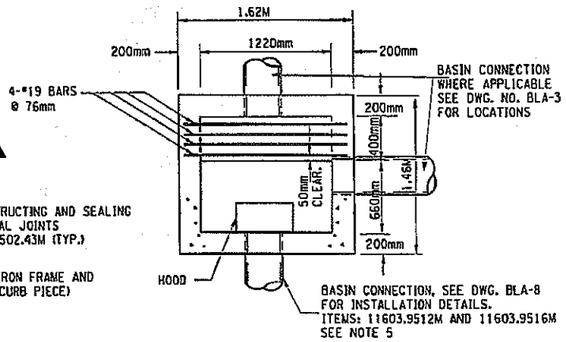
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

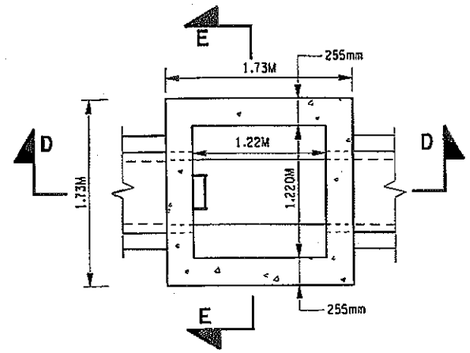
NEW YORK COUNTY PIN: X024.22



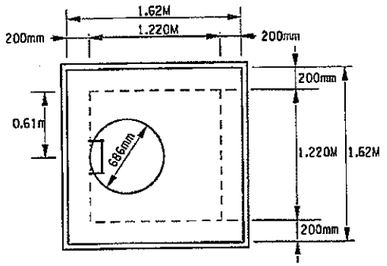
PLAN VIEW - WITH CASTING



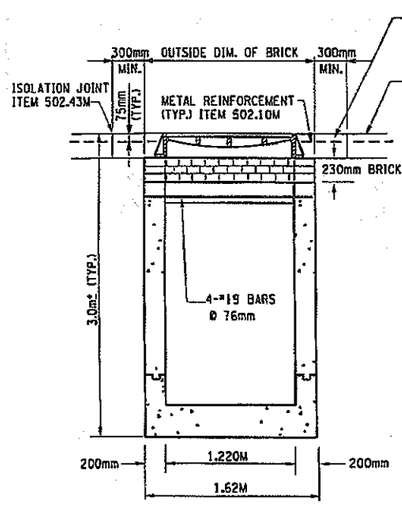
PLAN VIEW - WITHOUT CASTING



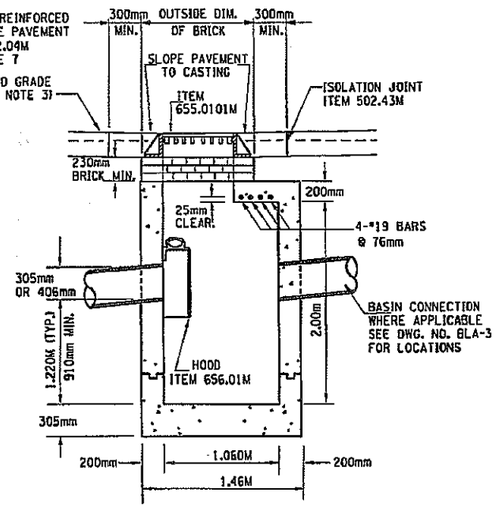
SECTIONAL PLAN C-C



ROOF PLAN



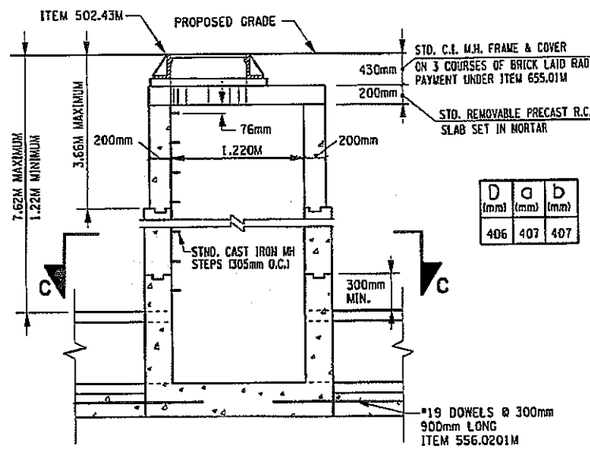
SECTION A-A



SECTION B-B

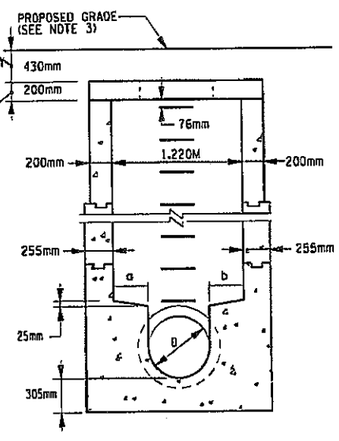
STANDARD CATCH BASIN ITEM 11604.0202 M

TYPE 2 CATCH BASIN - (NYC).



SECTION D-D

D (mm)	a (mm)	b (mm)
406	407	407



SECTION E-E

STANDARD MANHOLE ITEM 11604.0485 M

TYPE A-1 MANHOLE (NYC)

ITEM NO.	DESCRIPTION	UNIT
502.04M	CEMENT CONCRETE PAVEMENT, REINFORCED, CLASS C	CM
502.10M	METAL REINFORCEMENT FOR CONCRETE PAVEMENT (3 M WIDE OR GREATER)	SM
502.43M	CONSTRUCTING AND SEALING SPECIAL JOINTS	M
556.0201M	UNCOATED REINFORCEMENT FOR CONCRETE STRUCTURES	KG
11603.9512M	DIP ON CRUSHED STONE BEDDING, 305mm DIA. (NYC)	M
11603.9516M	DIP ON CRUSHED STONE BEDDING, 406mm DIA. (NYC)	M
11604.0202M	TYPE 2 CATCH BASIN - (NYC)	M
11604.0485M	NYC STANDARD MANHOLE TYPE A-1	M
655.0101M	FRAMES AND GRATES	SM
656.01M	MISCELLANEOUS METALS	KG

NOTES

1. CONCRETE FOR DRAINAGE STRUCTURE TO BE CLASS A, REBARS - GRADE 400.
2. LOCATION AND ANGLE OF INLET CONNECTION MAY VARY TO SUIT FIELD CONDITIONS. INLET CONNECTION SHALL BE INSTALLED WITH A MINIMUM DROP OF 76mm BETWEEN BASINS, AND BASIN CONNECTION SHALL BE INSTALLED WITH A MINIMUM DROP OF 152mm FROM THE BASIN TO THE SEWER.
3. SEE BUS STALL AND PEDESTRIAN PLATFORM SECTION ON DWG. NO. BLA-10 FOR PAY ITEMS AND LIMITS AND DWG. BLA-3 FOR PROPOSED GRADING.
4. KEYED CONSTRUCTION JOINTS REQ'D. BETWEEN ANY SUCCESSIVE POURS.
5. FOR PIPE SIZES, SEE DRAINAGE TABLES ON DWG. NO. BLA-19
6. BAR #19 IS METRIC EQUIVALENT OF BAR #6 IN ENGLISH UNITS.

NOTES

7. REINFORCED CONCRETE PAVEMENT AROUND STRUCTURE AND 300mm OFFSET ISOLATION JOINT IS TO BE USED FOR REINFORCED CONCRETE PAVEMENT IN BUS PARKING LOT. FOR THE STRUCTURE IN THE CONCRETE SIDEWALK, CREATE ISOLATION JOINT AROUND THE FRAME OR GRATE.

AS-BUILT REVISIONS

SIGNATURE DATE

DRAINAGE DETAILS - 2
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-7	DEC 2000	N.T.S.

LiRo-Kassner, Inc.

EARTH TECH

DESIGNED BY: SH/MB CHECKED BY: GK
DRAFTED BY: MC/MB/SH CHECKED BY: KH
ESTIMATED BY: KH CHECKED BY: SH/MB
IN CHARGE OF: RP

USER
MAY 20
X02422B.DGN

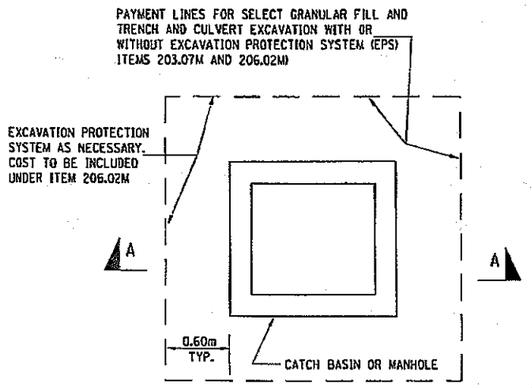
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	122	142

ROUTE 9A RECONSTRUCTION PROJECT

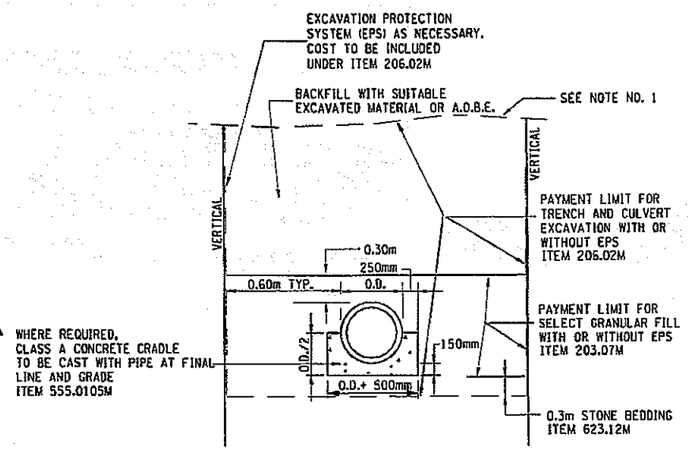
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

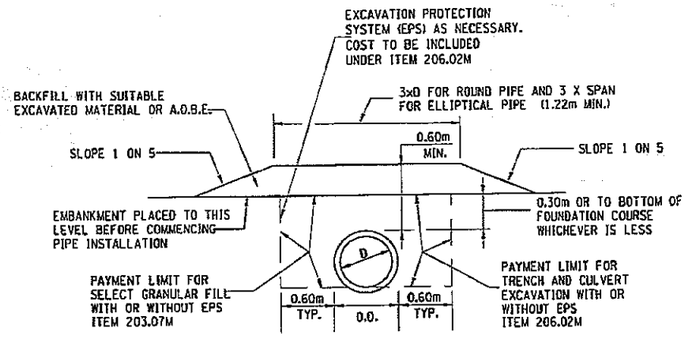
NEW YORK COUNTY PIN: X024.22



PLAN-CATCH BASINS AND MANHOLES
SCALE: NTS



DRAINAGE PIPE ON CRADLE
SCALE: NTS
(SEE NOTE NO. 2)



CONSTRUCTION EQUIPMENT CROSSING
SCALE: NTS

CATCH BASINS AND MANHOLES
SECTION A-A
SCALE: NTS

DRAINAGE PIPE ON GRANULAR FILL BEDDING
SCALE: NTS
(SEE NOTE NO. 2)

NOMINAL DIA. - mm		C mm
FROM	TO	
152	305	152
406	610	305

A (m)	
SHEETED TRENCH	UNSHEETED TRENCH
0.610m	0.305m

305mm AND 406mm DIP
DRAINAGE PIPE ON STONE BEDDING
SCALE: NTS

ITEM NO.	DESCRIPTION	UNIT	ITEM NO.	DESCRIPTION	UNIT
203.07M	SELECT GRANULAR FILL	CM			
206.02M	TRENCH AND CULVERT EXCAVATION	CM			
207.02M	GEOTEXTILE UNDERCUT	SM			
552.16M	EXCAVATION PROTECTION SYSTEM	SM			
555.0105M	CONCRETE FOR STRUCTURES, CLASS A	CM			
623.12M	CRUSHED STONE (IN PLACE MEASURED)	CM			

NOTES

1. THE UPPER PAYMENT LINE FOR TRENCH AND CULVERT EXCAVATION SHALL BE THE SUBGRADE OF THE ROADWAY.
2. THIS DETAIL TO BE USED WHERE SHOWN ON THE PLANS OR ORDERED BY THE ENGINEER.
3. THE CONTRACTOR SHALL MAINTAIN AN EXCAVATION PROTECTION SYSTEM (EPS) AS NECESSARY AND INCLUDE ALL COSTS UNDER APPLICABLE ITEMS FOR THIS WORK UNLESS A LAY BACK OPTION OF 1V:1.5H IS NOT PERMISSIBLE DUE TO ROW RESTRICTIONS, IN WHICH CASE AN EPS SHALL BE PAID FOR UNDER ITEM 552.16M.

AS-BUILT REVISIONS

SIGNATURE DATE

DRAINAGE DETAILS - 3
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-8	DEC 2000	N.T.S.

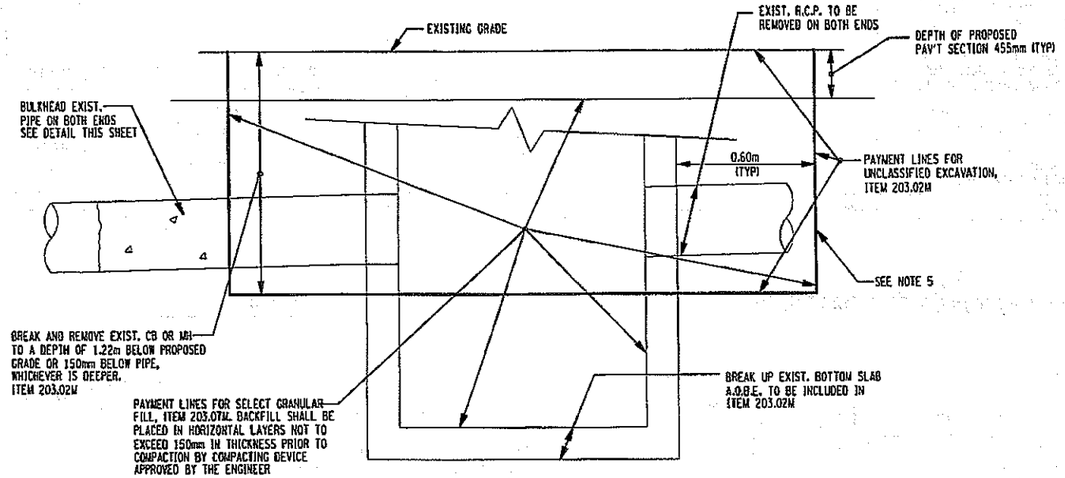
LiRo-Kassner, Inc.

EARTH TECH

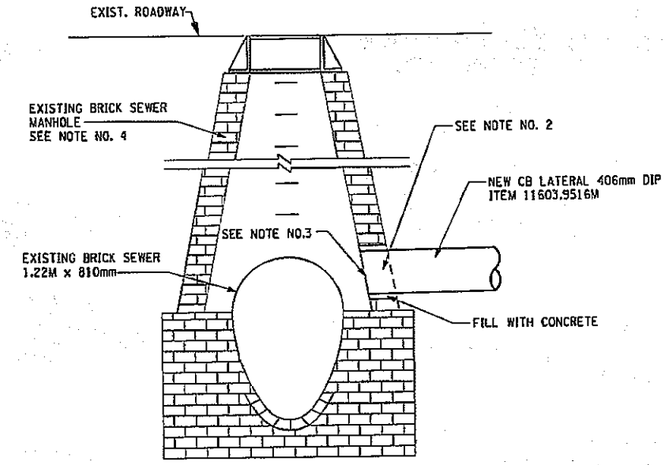
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CHECKED BY: MC/MB/SH
DRAFTED BY: GK
CHECKED BY: KH
IN CHARGE OF: RP

USER
MAY 2000
X02422C.DDT

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	123	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

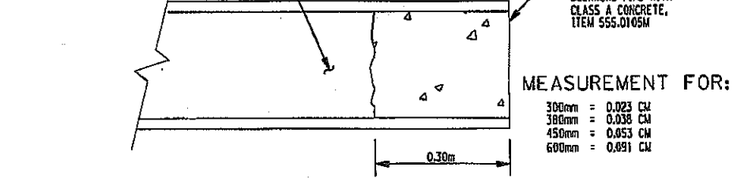


DRAINAGE STRUCTURE REMOVAL



CONNECTION DETAIL TO EXISTING BRICK SEWER MANHOLE

PAYMENT UNDER ITEM 11604.0726M



MEASUREMENT FOR:

300mm = 0.023 CM
380mm = 0.038 CM
450mm = 0.053 CM
600mm = 0.091 CM

BULKHEAD FOR ABANDONED PIPE

ITEM NO.	DESCRIPTION	UNIT
203.02M	UNCLASSIFIED EXCAVATION AND DISPOSAL	CM
203.07M	SELECT GRANULAR FILL	CM
203.19M	CLEANING DRAINAGE STRUCTURES AND MANHOLES	EA
11203.2802M	HYDRAULIC FILL	CM
552.16M	EXCAVATION PROTECTION SYSTEM	SM
555.0105M	CONCRETE FOR STRUCTURES, CLASS A	CM
11603.9516M	DIP ON CRUSHED STONE BEDDING, 406mm DIA. (NYC)	M
11604.0726M	CONNECTION TO EXISTING DRAINAGE FACILITIES	EA

NOTES

1. THE CONTRACTOR SHALL MAINTAIN FLOW IN EXISTING COMBINED SEWER DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL BREAK INTO THE EXISTING MANHOLE WALL IN A MANNER APPROVED BY THE ENGINEER. THE HOLE AROUND THE PROPOSED PIPE SHALL BE FILLED WITH CONCRETE TO CREATE A WATER TIGHT SEAL. PAYMENT INCLUDED UNDER ITEM 11604.0726M. THE CATCH BASIN CONNECTION WILL CONSIST OF A 406mm DUCTILE IRON PIPE ON A 305mm BED OF BROKEN STONE. PAYMENT UNDER ITEM 11603.9516M.
3. NEW PIPE TO BE FLUSH WITH INTERNAL WALL OF EXISTING STRUCTURE.
4. THE CONTRACTOR SHALL CLEAN EXISTING BRICK SEWER MANHOLE PRIOR TO CONNECTION. PAYMENT UNDER ITEM 203.19M.
5. THE CONTRACTOR SHALL MAINTAIN AN EXCAVATION PROTECTION SYSTEM (EPS) AS NECESSARY AND INCLUDE ALL COSTS UNDER APPLICABLE ITEMS FOR THIS WORK UNLESS A LAY BACK OPTION IS NOT PERMISSIBLE DUE TO ROW RESTRICTIONS, IN WHICH CASE AN EPS SHALL BE PAID FOR UNDER ITEM 552.16M.

AS-BUILT REVISIONS

SIGNATURE DATE

MISCELLANEOUS DETAILS - 1
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-9	DEC 2000	N.T.S.

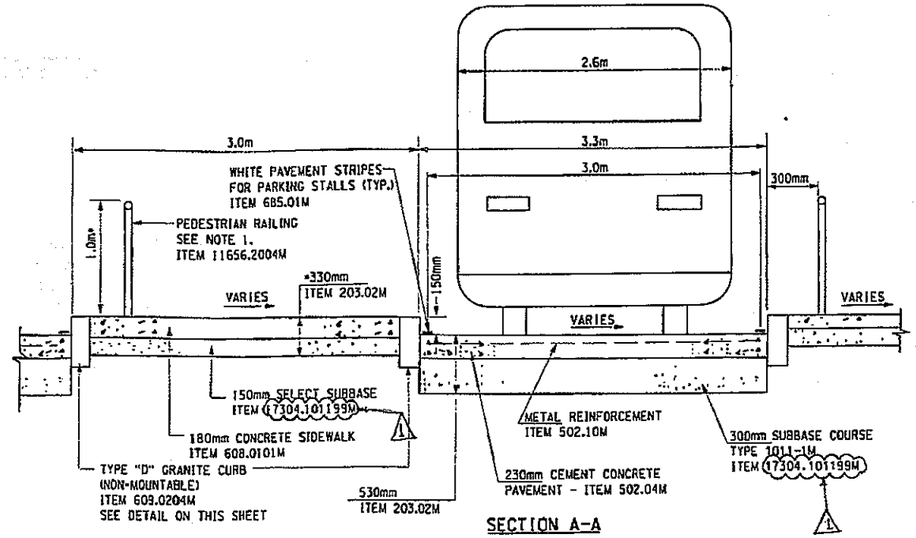
LiRo-Kassner, Inc.

EARTH TECH

ESTIMATED BY: SH/MB CHECKED BY: KH
DESIGNED BY: SH/MB CHECKED BY: GK
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IN CHARGE OF: RP

USER
MAY 2001
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D258583

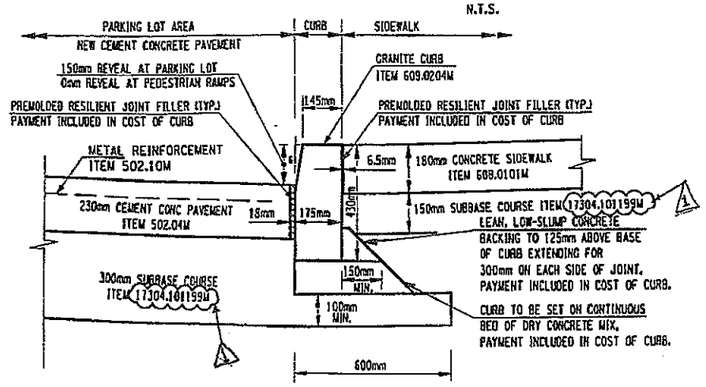


SECTION A-A

BUS STALL AND PEDESTRIAN PLATFORM

REFERS TO SECTION ON DWG. BLA-1

N.T.S.



SECTION B-B

STONE CURB, GRANITE TYPE 'D'

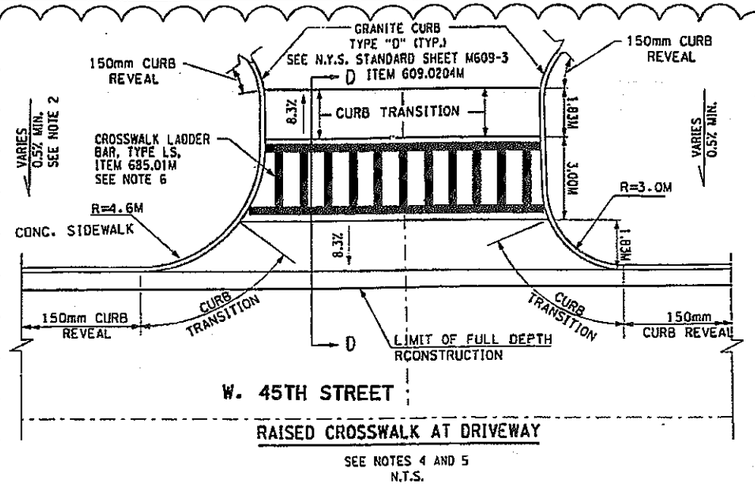
AT PARKING LOT AREA

REFERS TO SECTION ON DWG. BLA-1

N.T.S.

ITEM NO.	DESCRIPTION	UNIT
203.02M	UNCLASSIFIED EXCAVATION AND DISPOSAL	CM
(17304.101199M)	SUBBASE COURSE, TYPE 1011-1M	CM
403.130001M	ASPHALT CONCRETE - TYPE 3 BINDER COURSE	MT
403.160001M	ASPHALT CONCRETE - TYPE 6 TOP COURSE	MT
490.10M	PRODUCTION COLD MILLING CONCRETE	SM
502.04M	CEMENT CONCRETE PAVEMENT, REINFORCED, CLASS C	CM
502.10M	METAL REINF FOR CONC PVMNT (3M WIDE OR GREATER)	SM
502.43M	CONSTRUCTING AND SEALING SPECIAL JOINTS	M
503.0101M	CEMENT CONC FNDTN FOR PVMNT, UNREINF, CLASS C	CM
608.0101M	CONCRETE SIDEWALKS AND DRIVEWAYS	CM
609.0204M	GRANITE CURB (TYPE "D")	M
11656.2004M	HANDRAILS AND RAILINGS	M
685.01M	WHITE EPOXY REFLECT PAVEMENT STRIPES - 0.38mm	M

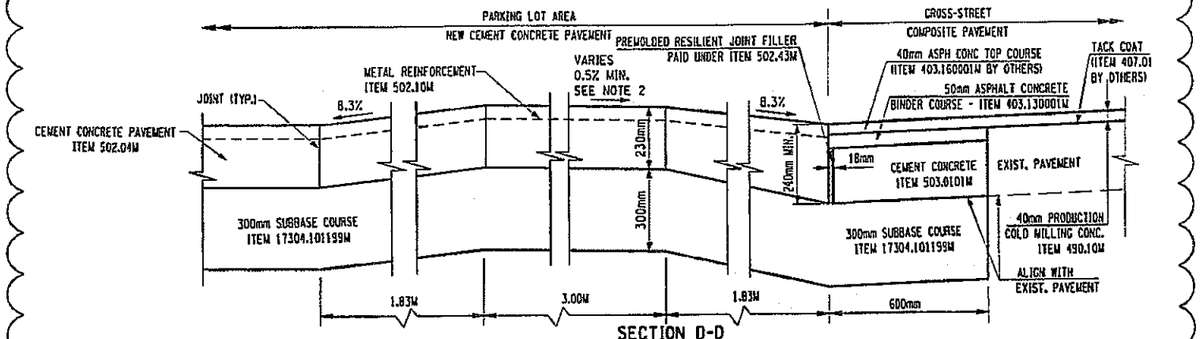
1. FOR PEDESTRIAN RAILING LOCATIONS AND DETAILS SEE DWG. NOS. BLA-1 AND BLA-11.
2. SIDEWALK AND PARKING LANE SLOPES ARE TYPICAL, SEE GRADING PLANS DWG. NO. BLA-3 FOR ACTUAL GRADING.
3. THE CURB GEOMETRY AND DIMENSIONS FOR GRANITE CURB TYPE "D" IS TO BE USED IN PLACE OF THE CURBS AS SHOWN ON NYS DOT STANDARD SHEETS M609-2 AND M609-3.
4. THE RAISED CROSSWALK AT 46TH STREET SHALL MIRROR THAT SHOWN IN THIS DETAIL FOR 45TH STREET.
5. RAISED CROSSWALK SHALL BE AN EXTENSION OF THE SIDEWALK AND SHALL BE LEVEL WITH THE CURB.
6. REFER TO STANDARD SHEET M685-2R1 FOR CROSSWALK PAVEMENT MARKINGS.



RAISED CROSSWALK AT DRIVEWAY

SEE NOTES 4 AND 5

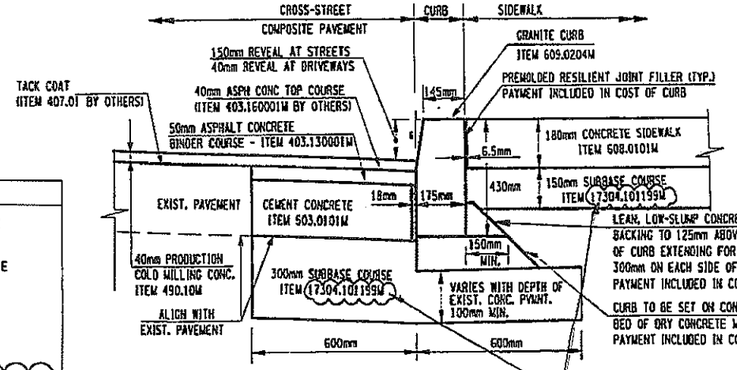
N.T.S.



SECTION D-D

CONCRETE PAVEMENT AT RAISED CROSSWALK & STREETS

N.T.S.



SECTION C-C

STONE CURB, GRANITE TYPE 'D'

AT CROSS STREETS

REFERS TO SECTION ON DWG. BLA-1

N.T.S.

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		124F1	R 142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 124F1, SUPERSEDES SHEET 124.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

1 2 DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1 EMS CLOUDED AREAS DENOTES REVISION OVER CONTRACT SHEET # 124

2 No Permanent work in the Roadway area done, due to contaminated soil. Contractor will submit Remediation Plan.

SIGNATURE — DATE 5/24/04

REVISIONS ONLY

EARTH TECH

A QUEST INTERNATIONAL LTD. COMPANY

LiRo-Kassner, Inc.

MISCELLANEOUS DETAILS - 2
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-10	DEC 2000	AS NOTED

EARTH TECH

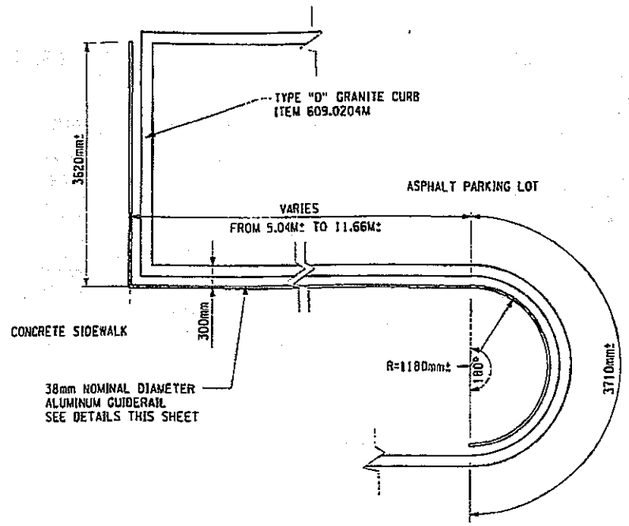
D258583

ESTIMATED BY: SH/MB
CHECKED BY: GK
DRAFTED BY: MC/MB/SH
CHECKED BY: KH
DESIGNED BY: SH/MB
IN CHARGE OF: RP

USER
DECEMBER 2000
X024228.MDT

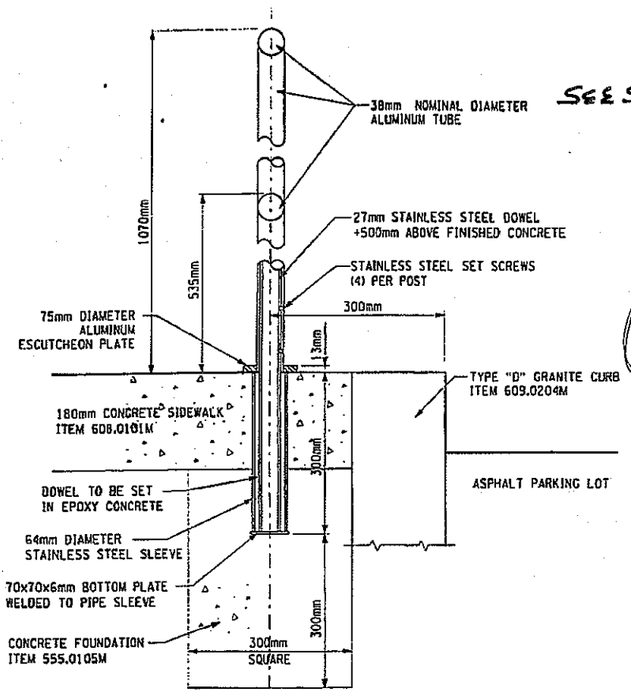
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D258583



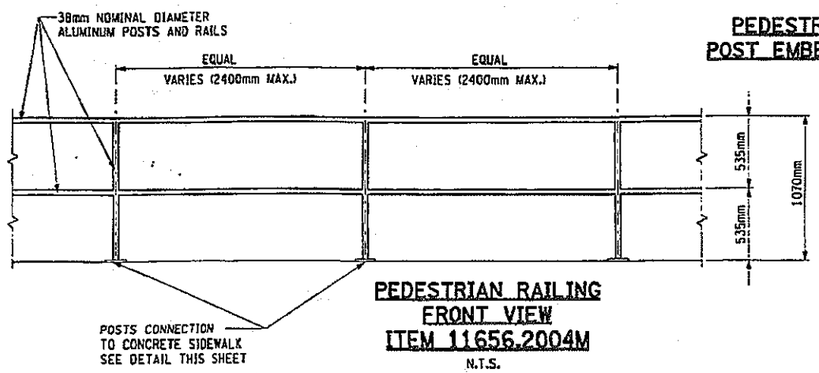
PEDESTRIAN RAILING
PLAN VIEW
ITEM 11656.2004M

N.T.S.



PEDESTRIAN RAILING
POST EMBEDMENT DETAIL

N.T.S.



PEDESTRIAN RAILING
FRONT VIEW
ITEM 11656.2004M

N.T.S.

ITEM NO.	DESCRIPTION	UNIT
17304.101194M	SUBBASE COURSE, TYPE 1011-1M	CM
555.0105M	CONCRETE FOR STRUCTURES, CLASS A	CM
608.0101M	CONCRETE SIDEWALKS AND DRIVEWAYS	CM
609.0204M	GRANITE CURB (TYPE "D")	M
11656.2004M	HANDRAILS AND RAILINGS	M

NOTES

1. THE RAILING SYSTEM SHALL BE ALUMINUM ALLOY 6063-T6, SCHEDULE 40 EXTRUDED HANDRAIL PIPE AND SHALL BE AS SPECIFIED UNDER ASTM B 429.
2. RAILING SYSTEM IS TO HAVE A MILL FINISH WITH A CLEAR ANODIZED COATING.
3. APPROVED SHOP DRAWINGS WILL BE REQUIRED FOR ALL DETAILS SHOWING FABRICATION AND INSTALLATION OF GUARDRAILS.
4. DOWELS ANCHORING RAILINGS TO CONCRETE SHALL BE SEATED IN AN EPOXY COMPOUND SPECIFICALLY FORMULATED FOR THAT PURPOSE. THE PRODUCT SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

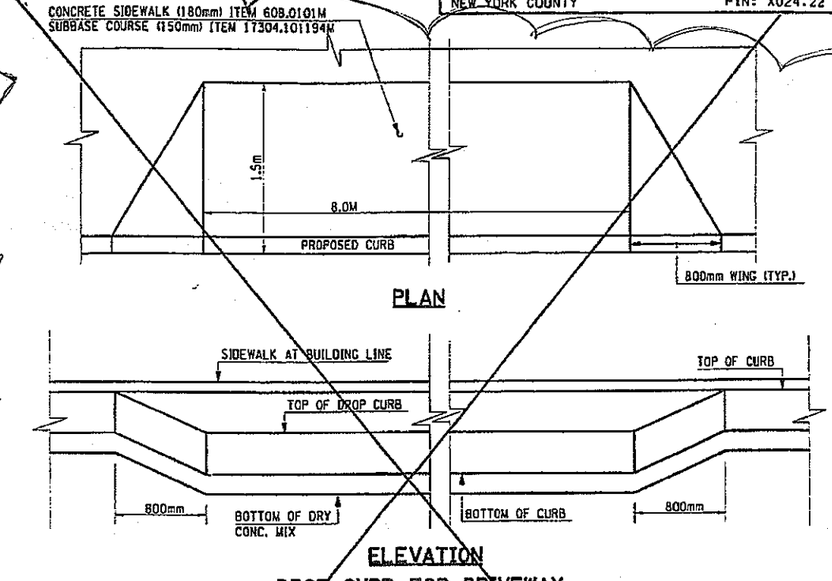
NOTES

5. NO SEPARATE PAYMENT WILL BE DONE FOR WORK OR MATERIALS CALLED FOR IN NOTE 4. COST TO BE INCLUDED IN THE PRICE BID FOR THE RAILINGS.

FIELD CHANGE SHEET

THIS SHEET, 125F1, SUPERSEDES SHEET 125.

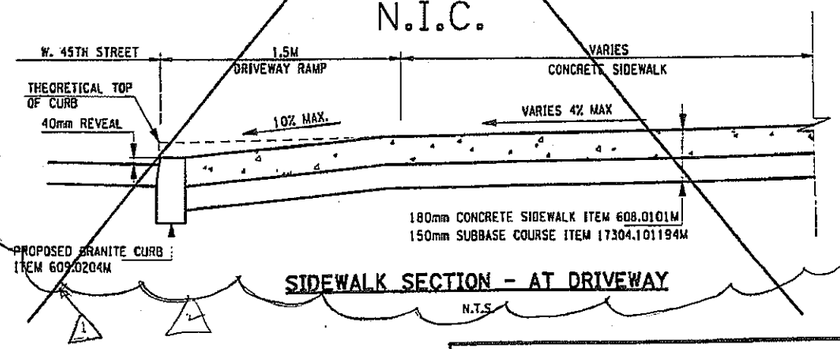
See Sheet No. 4F1 for Approval Signatures



PLAN

ELEVATION
DROP CURB FOR DRIVEWAY
@ STA. 1+045.9± W. 45TH STREET

N.I.C.



SIDEWALK SECTION - AT DRIVEWAY

N.T.S.

DENOTES REVISIONS
AUGUST 2002

AS-BUILT REVISIONS

1. SIDE WALK SECTION IS REMOVED FROM DRAWING WITHIN CLOUDED AREA.
2. No Permanent work done in this Intrepid area.

SIGNATURE — DATE 5/6/04

MISCELLANEOUS DETAILS - 3
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-11	DEC 2000	AS NOTED

LiRo-Kassner, Inc.

EARTH TECH

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		125F1 R1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY — PIN: X024.22

DESIGNED BY: SH/MB
DRAFTED BY: MC/MB/SH
CHECKED BY: GK
ESTIMATED BY: SH/MB
CHECKED BY: KH
IN CHARGE OF: RP

USER
DECEMBER 2000
X02422C.MDT

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	126	142

ROUTE 9A RECONSTRUCTION PROJECT

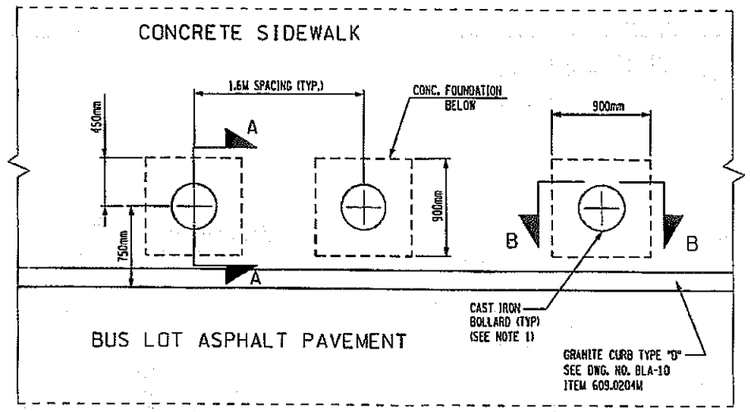
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

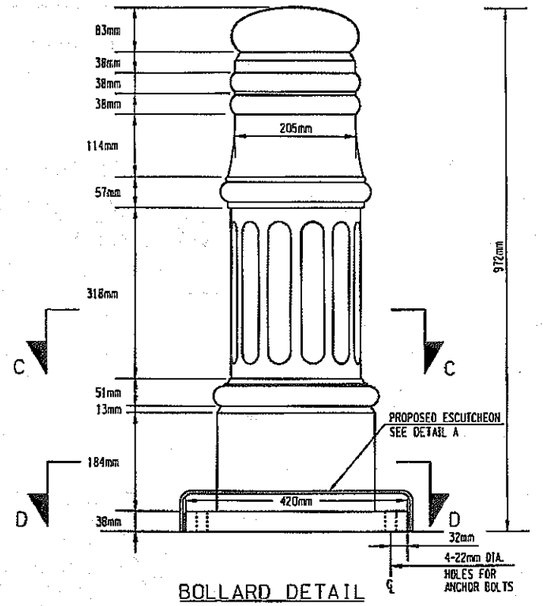
NEW YORK COUNTY — PIN: X024.22

DESIGNED BY: SH/MB CHECKED BY: GK DRAFTED BY: MC/MB/SH CHECKED BY: KH ESTIMATED BY: SH/MB CHECKED BY: KH IN CHARGE OF: RP

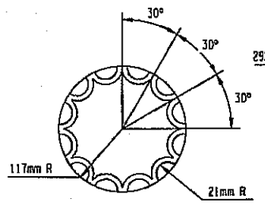
USER MAY 2008 X024220.MDT



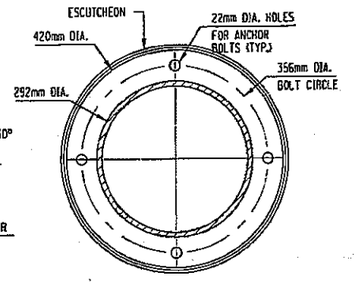
PLAN
SCALE 1:25



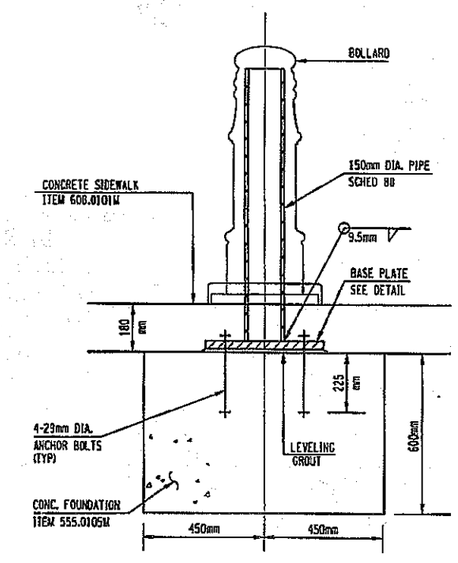
BOLLARD DETAIL
SCALE 1:5



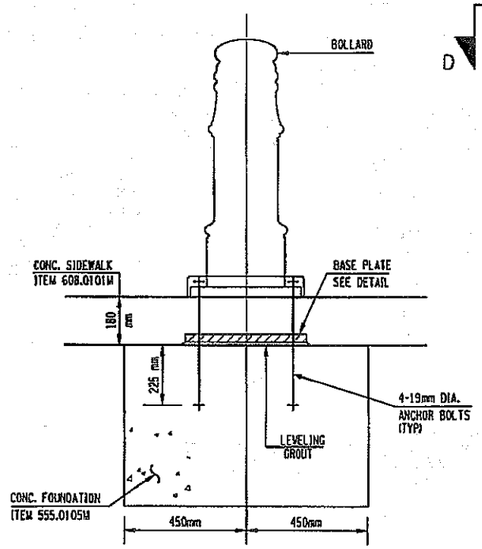
SECTION C-C
SCALE 1:5



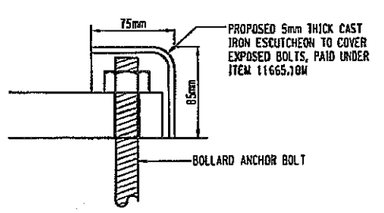
SECTION D-D
SCALE 1:5



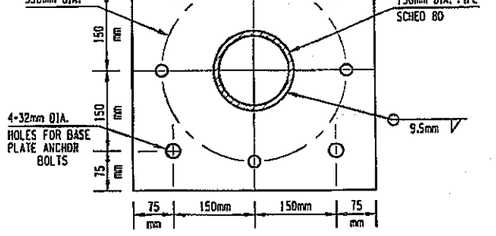
SECTION A-A
SCALE 1:10



SECTION B-B
SCALE 1:10



DETAIL A
N.T.S.



BASE PLATE DETAIL
SCALE 1:5

ITEM NO.	DESCRIPTION	UNIT
555.0105M	CONCRETE FOR STRUCTURES, CLASS A	CM
608.0101M	CONCRETE SIDEWALK AND DRIVEWAYS	CM
609.0204M	GRANITE CURB (TYPE "D")	M
11665.10M	FURNISH AND INSTALL BOLLARDS	EA

NOTES

1. FOR LOCATIONS OF BOLLARDS, SEE DWG. NO BLA-1
2. BOLLARD IS 10mm THICK CAST IRON.
3. 150mm DIA. PIPE, BASE PLATE AND ANCHOR BOLTS ARE TO BE INCLUDED IN THE BID PRICE FOR THE CAST IRON BOLLARD, ITEM 11665.10M.
4. THE CONTRACTOR SHALL DEVELOP THE DETAIL, TO BE INCLUDED IN THE SHOP DRAWING, DEPICTING THE METHOD FOR ATTACHING THE ESCUTCHEON TO THE BOLLARD.
5. THE CONTRACTOR IS TO SUBMIT SHOP DRAWING FOR APPROVAL BEFORE FABRICATING BOLLARDS. COLOR OF BOLLARDS AND ESCUTCHEON TO BE BLACK GLOSS FEDERAL COLOR # 17038.

NOTES

AS-BUILT REVISIONS

SIGNATURE DATE

MISCELLANEOUS DETAILS - 4
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

LiRo-Kassner, Inc.

DWG. NO.	DATE	SCALE	EARTH TECH
BLA-12	DEC 2000	AS SHOWN	

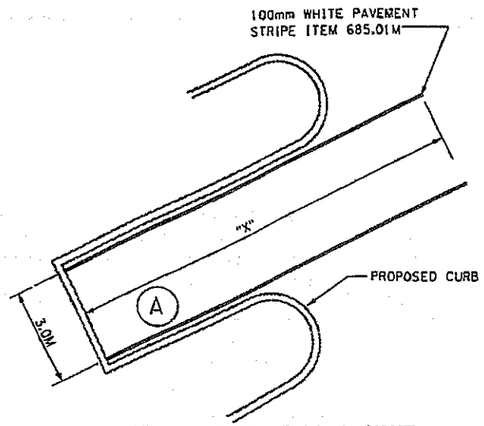
D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		127F1	R1 142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

FIELD CHANGE SHEET

THIS SHEET, 127F1, SUPERSEDES SHEET 127.

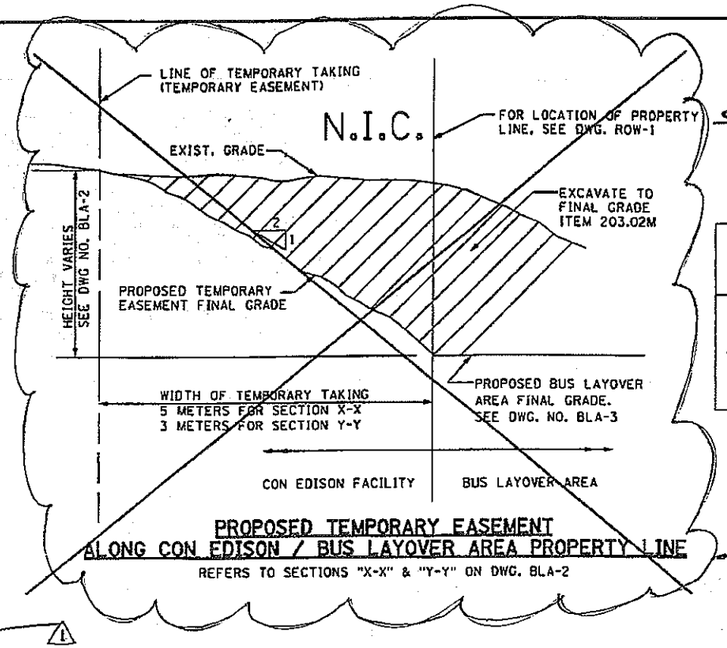
SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES



TYPICAL BUS STALL LAYOUT
ITEM 685.01M

STALL NUMBER (A)	LENGTH OF MARKING "X"	COMMENTS
(1) THRU (5)	12.2M	FOR FULL TOUR/SCHOOL BUSES
(6)	7.0M	FOR MINI BUSES
(7) THRU (11)	12.2M	FOR FULL TOUR/SCHOOL BUSES
(12) THRU (15)	15.25M	FOR FULL TOUR/SCHOOL BUSES

NOTE:
SEE DRAWING BLA-1 FOR STALL NUMBER LOCATION



PROPOSED TEMPORARY EASEMENT
ALONG CON EDISON / BUS LAYOVER AREA PROPERTY LINE
REFERS TO SECTIONS "X-X" & "Y-Y" ON DWG. BLA-2

ITEM NO.	LOCATION	TEXT NO.	TEXT	LETTER SIZE	LETTER TYPE	APPROX. SIZE OF SIGN	M.U.T.C.D. NO.	COLOR BACK GROUND	COLOR CHARACTERS	TYPE OF MOUNT
645.7101M 645.81M	STALL NO. (6) N.I.C.	1	MINI BUS ONLY	75 mm 75 mm	C C	450 mm x 600 mm	R5-12 (MOD.)	W	B	GR-MTD

LEGEND	
SYMBOL	COLOR
W	WHITE
B	BLACK
R	RED
Y	YELLOW

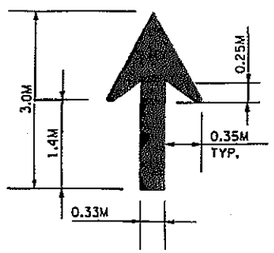
NOTE:
FOR DETAILS OF TRAFFIC SIGN INSTALLATION REFER TO NYS DOT STANDARDS DWG NOS. M645-50 THRU M645-80 AS APPLICABLE.

LEGEND

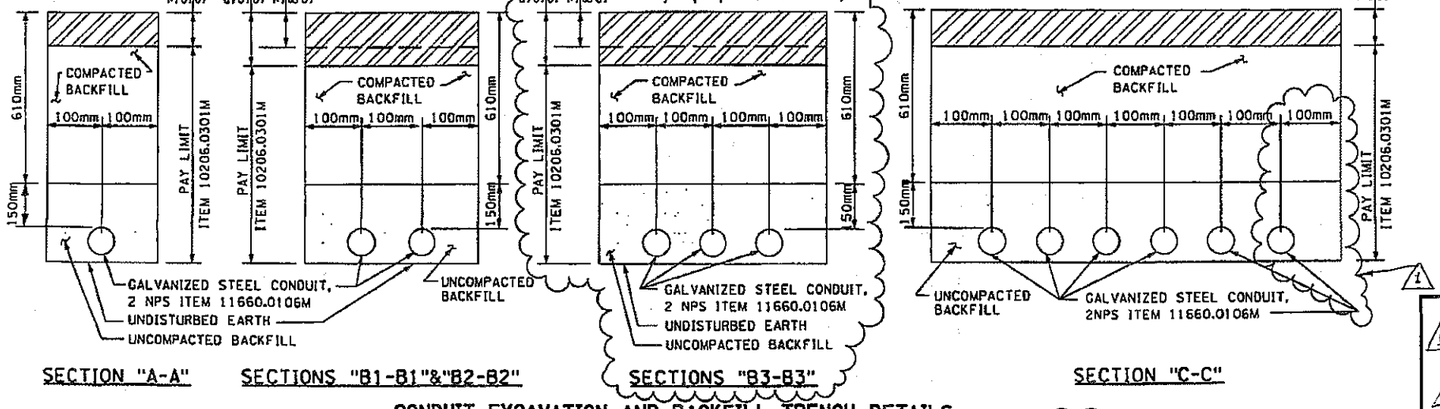
(1) / (2) SIGN LOCATION NO. / SIGN TEXT NO.

GR-MTD GROUND MOUNTED

M.U.T.C.D. = MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
F.H.A. = FEDERAL HIGHWAY ADMINISTRATION



WHITE ARROW PAVEMENT
SYMBOL ITEM 685.04M



CONDUIT EXCAVATION AND BACKFILL TRENCH DETAILS
ITEM 10206.0301M
REFERS TO SECTIONS ON DWG. BLA-4
N.T.S.

DENOTES REVISIONS AUGUST 2002

NOTE:
1. FOR INSULATED CONDUCTOR SIZE AND PLACEMENT, SEE DWG. BLA-4
2. BACKFILL PLACEMENT AND COMPACTION SHALL FOLLOW NYSDOT STANDARD DETAIL SHEET M680-12.
3. COMPACTED BACKFILL SHALL CONSIST OF STONES NO LARGER THAN 19MM.

AS-BUILT REVISIONS

1 CLOUDED AREAS DENOTES CHANGES OVER CONTRACT SHEET # 127

2 N. . . . .

SIGNATURE DATE

REVISIONS ONLY
EARTH TECH
A TOUCHE INTERNATIONAL LTD. COMPANY

Li Ro Kassner, Inc.

MISCELLANEOUS DETAILS - 5
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

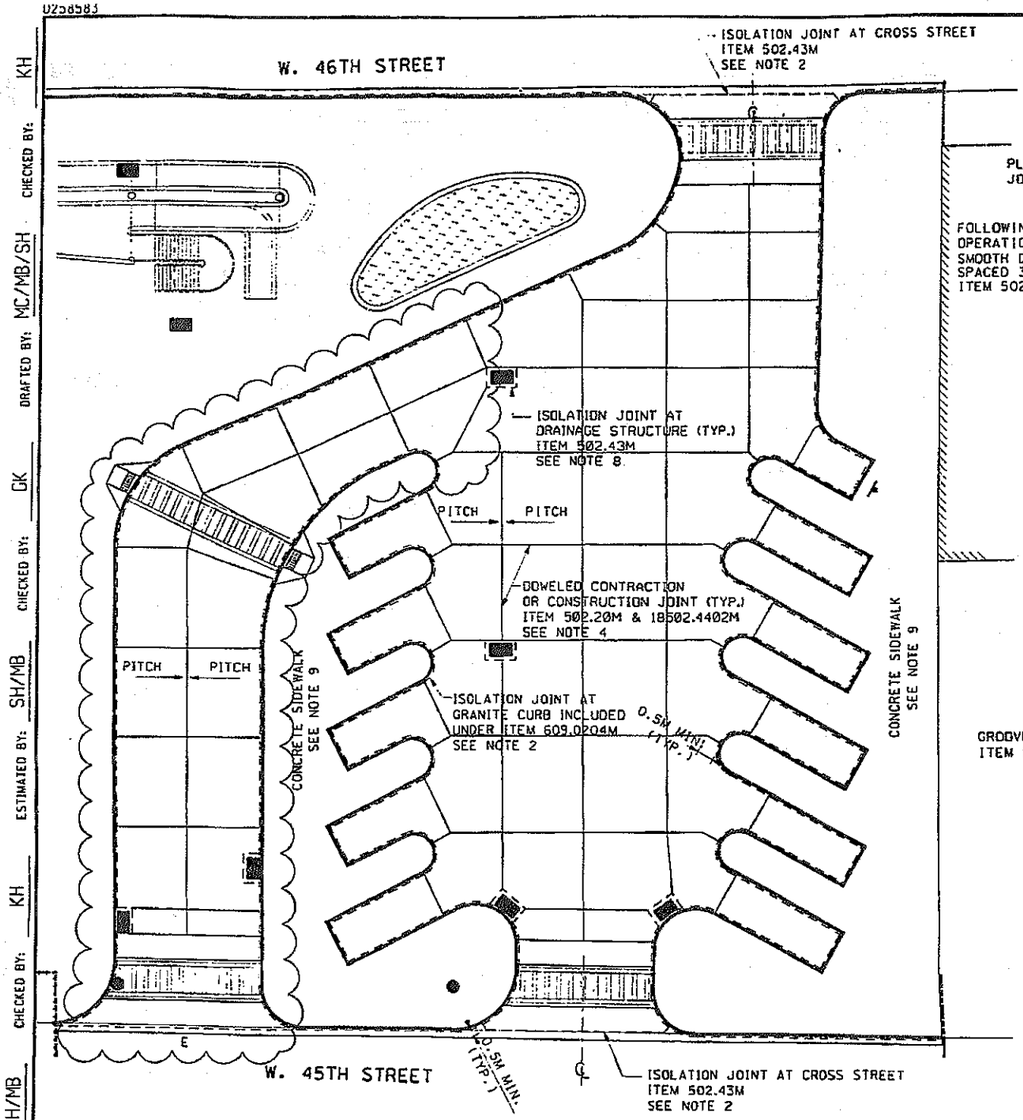
DWG. NO.	DATE	SCALE	
BLA-13	DEC 2000	N.T.S.	EARTH TECH

ESTIMATED BY: SH/MB
DESIGNED BY: SH/MB
DRAFTED BY: MC/MB/SH
CHECKED BY: GK
CHECKED BY: KH
IN CHARGE OF: RP

USER
DECEMBER 2000
X02422E.MDT

D258583

0258583



DENOTES REVISIONS AUGUST 2002

FIELD CHANGE SHEET

THIS SHEET, 128F1, SUPERSEDES SHEET 128.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

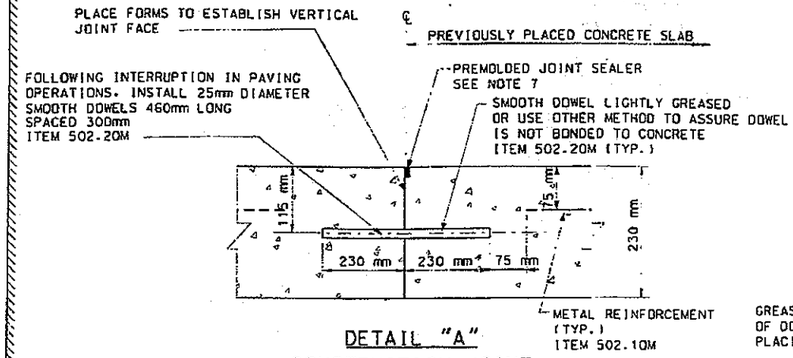
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		128F1 R	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

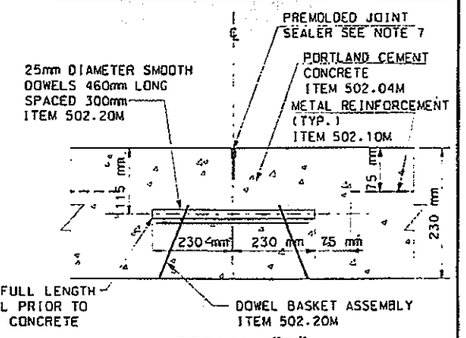
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22



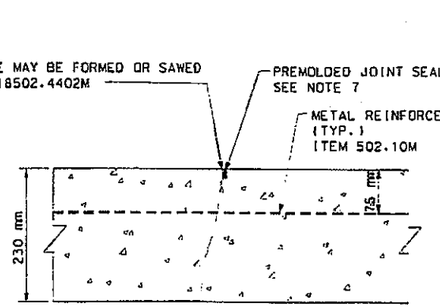
DETAIL "A"
CONSTRUCTION JOINT

NOTE:
FOR USE DURING INTERRUPTIONS IN CONCRETE PLACING OPERATIONS FOR BOTH LONGITUDINAL AND TRANSVERSE DIRECTIONS. (SEE NOTE 4)



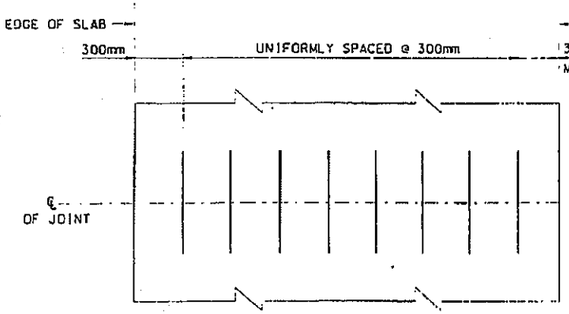
DETAIL "B"
DOWELED CONTRACTION JOINT

NOTE:
FOR USE IN LONGITUDINAL AND TRANSVERSE DIRECTION BETWEEN NEW SLABS AS SHOWN ON PLAN AND AS DESCRIBED UNDER NOTE 4.



DETAIL "C"
DUMMY CONTRACTION JOINT

NOTE:
FOR USE IN LONGITUDINAL AND TRANSVERSE DIRECTION AS DESCRIBED UNDER NOTE 4. (NOT SHOWN ON PLAN. SEE NOTES 1 & 4)



DETAIL "D"
DOWEL BARS SPACING
(TYPICAL ALL JOINTS)

ITEM NO.	DESCRIPTION	UNIT
502.04M	CEMENT CONCRETE PAVEMENT, REINFORCED, CLASS C	CM
502.10M	METAL REINFORCEMENT FOR CONCRETE PAVEMENT (3 M WIDE OR GREATER)	SM
502.20M	TRANSVERSE JOINT SUPPORTS (ALL TYPES)	M
502.43M	CONSTRUCTING AND SEALING SPECIAL JOINTS	M
18502.4402M	SAW AND SEAL PAVEMENT AND SHOULDER JOINTS IN NEW PC CONCRETE PAVEMENTS	M
609.0204M	GRANITE CURB, TYPE "D"	

NOTES

1. FOR SAW CUTTING AND FORMING REQUIREMENTS, SEE SPECIFICATIONS FOR PORTLAND CEMENT CONCRETE PAVEMENT, ITEM 502.04M.
2. FOR DETAILS OF ISOLATION JOINTS AT CURB AND CROSS STREETS, SEE SECTION B-B, C-C AND D-D ON DRAWING NO. BLA-10.
3. WHERE MEETING PREVIOUSLY PLACED SLAB, FORM SLOT IN CONCRETE ADJACENT TO THE PREVIOUSLY PLACED SLAB AND PLACE JOINT SEALANT AS SHOWN ON THE DETAILS.
4. NEW CONCRETE SLAB WILL BE CONSTRUCTED WITH MAXIMUM DIMENSIONS 7.5 METERS X 6 METERS WITH DOWELED CONTRACTION JOINTS PLACED BETWEEN ADJACENT SLABS (DETAIL B). THE DUMMY CONTRACTION JOINT (DETAIL C) SHALL BE CONSTRUCTED ALONG THE SLAB CENTERLINE IN BOTH DIRECTIONS. THE DUMMY JOINT WILL NOT BE REQUIRED FOR DIMENSION LESS THAN 5 METERS.

NOTES

5. THE JOINT LAYOUT SHOWN ON THIS DRAWING IS A SUGGESTED PLAN. THE CONTRACTOR MAY SUBMIT A REVISED PLAN FOR APPROVAL OF THE ENGINEER.
6. ELEVATIONS AT FOUR CORNERS OF EACH SLAB SHALL FOLLOW THE GRADING PLAN DWG. BLA-3.
7. FOR DIMENSIONS OF SAWED TRANSVERSE JOINTS AND REQUIREMENTS FOR THEIR SEALING SEE SPECIFICATION FOR ITEM 18502.4402M.
8. FOR DETAILS OF ISOLATION JOINTS AROUND DRAINAGE STRUCTURES, SEE DWG BLA-7.
9. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL SHOP DRAWINGS OF THE PROPOSED SCORE AND EXPANSION JOINTS FOR THE SIDEWALK AND PLAZA AREAS.

LEGEND:

——— DOWELED CONTRACTION (DETAIL "B") OR CONSTRUCTION JOINT (DETAIL "A")

– – – – ISOLATION JOINT

REVISIONS ONLY
EARTH TECH
A CH2M HILL COMPANY

LiRo Kassner, Inc.

AS-BUILT REVISIONS

1 CLOUDED AREA SHOWS REVISION SEE SHEETS 128F2 & 128F3

SIGNATURE DATE

MISCELLANEOUS DETAILS - 6
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-14	DEC 2000	1:200	EARTH TECH

DESIGNED BY: SH/MB
DRAFTED BY: MC/MB/SH
ESTIMATED BY: SH/MB
CHECKED BY: KH
CHECKED BY: GK
CHECKED BY: KH
IN CHARGE OF: RP

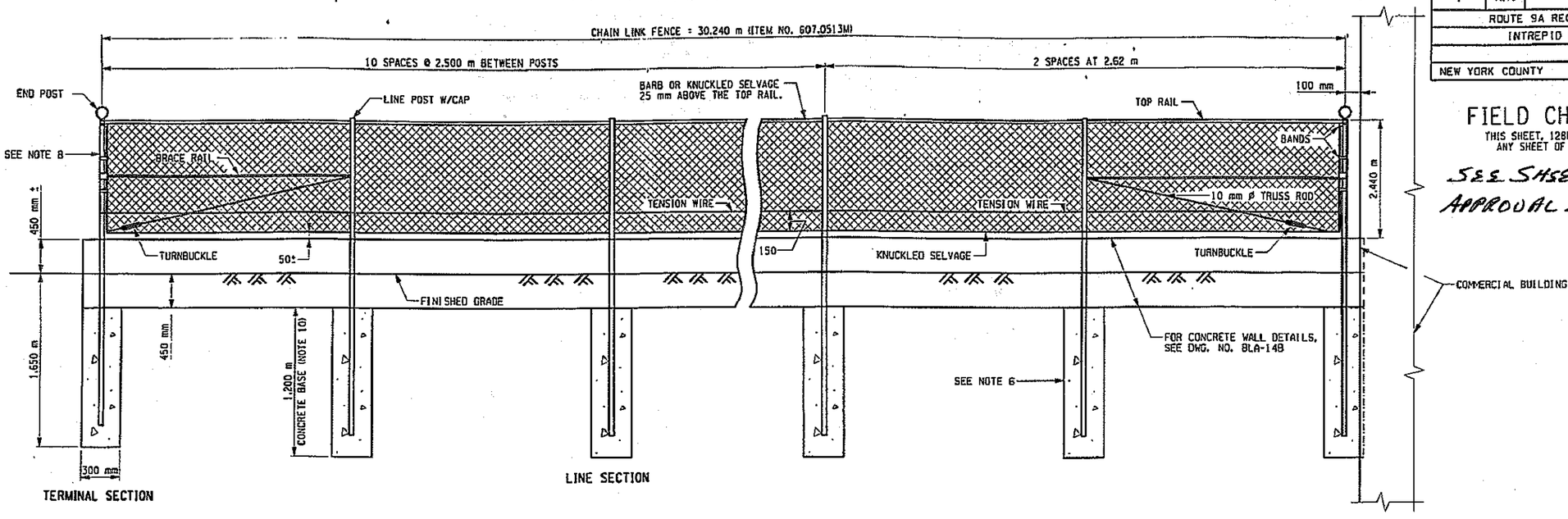
0258583

FED. RD. REC. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		128F2	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

FIELD CHANGE SHEET

THIS SHEET, 128F2, DOES NOT SUPERSEDE ANY SHEET OF THE CONTRACT PLANS.

SEE SHEET No 4F1 FOR APPROVAL SIGNATURES



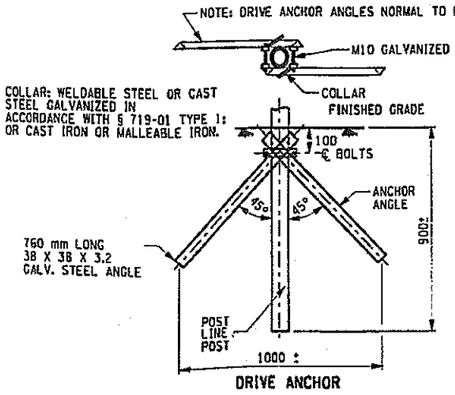
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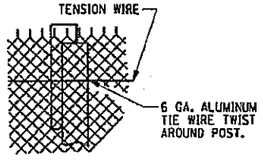
1. POSTS, INCLUDING ENCASEMENT, SHALL BE SET INSIDE THE R.O.W. LINE SO THAT FENCING PLACED ON THE R.O.W. SIDE OF POSTS WILL BE AS NEARLY ON THE R.O.W. LINE AS POSSIBLE, WHEN DIRECTED BY THE ENGINEER. THE FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE POSTS SO THAT THE FABRIC CAN BE PULLED TIGHT AGAINST THE POST.
2. POSTS IN ROCK. WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE 25 MILIMETERS LARGER IN DIAMETER THAN THE POST, AND OF 450 mm MIN. DEPTH FOR LINE POSTS, AND 600 mm MIN. DEPTH FOR ALL OTHER POSTS SHALL BE MADE. AFTER INSERTING THE POSTS, THE HOLES SHALL BE BACKFILLED WITH A HANDMIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT TWO PARTS FINE AGGREGATE MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGNS OF FREE WATER. THE HAND MIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PERFORMED IN A MANNER APPROVED BY THE ENGINEER.
3. CORNER POSTS SHALL BE USED AT SHARP BREAKS IN VERTICAL GRADE, AND CHANGES IN HORIZONTAL ALIGNMENT OF 15° AND OVER. PULL POSTS SHALL BE USED EVERY 152.5 m ON STRAIGHT RUNS OF CHAIN LINK FENCE OR AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL SUBMIT THE DETAILS FOR THE CHAIN LINK FENCE IT PLANS TO ERECT TO THE ENGINEER. NO FENCE SHALL BE ERECTED PRIOR TO THE APPROVAL OF THE VARIOUS DETAILS.
5. STEEL PIPES AND SHAPES SHALL WEIGH AT LEAST 95% OF THE WEIGHT SPECIFIED ON THIS SHEET. THEY MAY EXCEED THE SPECIFIED WEIGHT.
6. THE CONCRETE BASES SHALL BE A MINIMUM OF 300 mm ø BY 1200 mm DEEP WITH THE POST EMBEDDED 900 mm. PAID FOR UNDER ITEM NO. 607.0513M
7. ALL DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION AND ERECTION.
8. CLASS A OR CLASS B POSTS REQUIRE STRETCHER BARS AND BANDS. CLASS C POSTS HAVE THE FENCE FABRIC WOVEN INTO THE POST. (SEE MANUFACTURER'S INSTRUCTIONS)
9. FOR CONCRETE WALL DETAILS, SEE DRAWING NO. BLA-14B
10. CONTRATOR SHALL NOT BE PERMITTED TO SUBSTITUTE CONCRETE BASE OTHER THAN WHAT IS PERMITTED AS PER NOTE 2.

ACCESSORY	STEEL	ALUMINUM
FABRIC TIES FOR TOP AND BRACE	6 GA. ALUMINUM WIRE AT 600 mm CC MAX.	4.88 mm ø ALUMINUM WIRE AT 600 mm CC MAX.
FABRIC TIES FOR LINE POSTS	6 GA. ALUMINUM WIRE AT 350 mm CC MAX.	4.88 mm ø ALUMINUM WIRE AT 350 mm MAX. OR 13 mm X 1.5 mm CLIPS AT 350 mm MAX.
FABRIC TIES FOR TENSION WIRE	11 GA. ALUMINUM WIRE AT 300 mm O.C.	3.05 mm ø ALUMINUM WIRE AT 300 mm
BOTTOM TENSION WIRE	7 GA. GALVANIZED STEEL	4.88 mm ø ALUMINUM WIRE

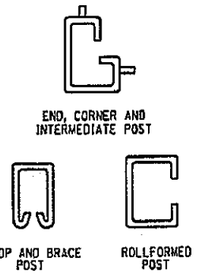
POST AND RAIL SCHEDULE

USE	SECTION	STEEL				ALUMINUM			
		NPS DESIGNATOR	ROLLFORMED & H POSTS (mm)	O.D. mm	WEIGHT kg/m	NPS DESIGNATOR	H POSTS mm	O.D. mm	WEIGHT kg/m
END, CORNER AND INTERMEDIATE POSTS	CLASS A SCHEDULE 40 PIPE	2½		73.0	8.63	2½	—	73.0	2.98
	CLASS B STEEL TUBING	2½		73.0	6.91	—	—	—	—
	CLASS C ROLLFORMED •	—	88.9 X 88.9	—	7.59	—	—	—	—
BRACE RAILS	CLASS A SCHEDULE 40 PIPE	1¼		42.2	3.39	1¼	—	42.2	1.18
	CLASS B STEEL TUBING	1¼		42.2	2.73	—	—	—	—
	CLASS C ROLLFORMED	—	41.3 X 31.8	—	2.01	—	—	—	—
TOP RAIL	CLASS A SCHEDULE 40 PIPE	1¼		42.2	3.39	1¼	—	42.2	1.18
	CLASS B STEEL TUBING	1¼		42.2	2.73	—	—	—	—
	CLASS C ROLLFORMED	—	41.3 X 31.8	—	2.01	—	—	—	—
LINE POSTS	CLASS A SCHEDULE 40 PIPE	2	—	60.3	5.44	2	—	60.3	1.88
	CLASS B STEEL TUBING	2	—	60.3	4.64	—	—	—	—
	CLASS C ROLLFORMED	—	47.6 X 41.3	—	3.57	—	—	—	—
	H POSTS	—	57.2 X 43.2	—	5.10	—	47.6 X 39.7	—	1.35
	—	—	—	—	—	—	57.2 X 50.8	—	1.82





SUGGESTED METHOD OF TYING TENSION WIRE TO LINE POST



CLASS "C" ROLLFORMED SECTIONS (SEE POST AND RAIL SCHEDULE FOR DIMENSIONS)

AS-BUILT REVISIONS

SIGNATURE DATE

MISCELLANEOUS DETAILS - 8
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-14A	AUGUST 2002	N.T.S.	EARTH TECH

0258583

DESIGNED BY: JD CHECKED BY: NS DRAFTED BY: AR CHECKED BY: JD ESTIMATED BY: AC CHECKED BY: JD IN CHARGE OF: NS

USER AUGUST 2002 X024220.MDT

FIELD CHANGE SHEET

THIS SHEET, 128F3, DOES NOT SUPERSEDE ANY SHEET OF THE CONTRACT PLANS.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

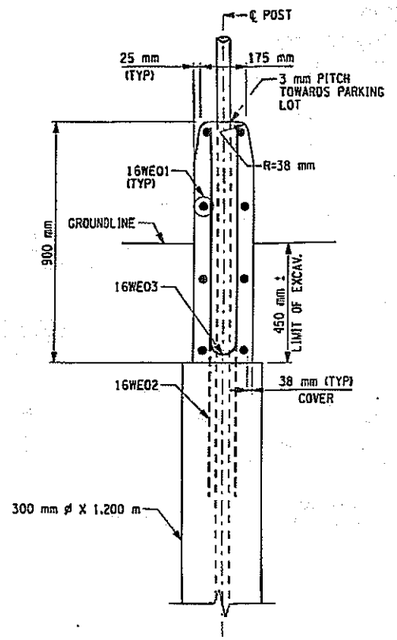
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		128F3	142

ROUTE 9A RECONSTRUCTION PROJECT

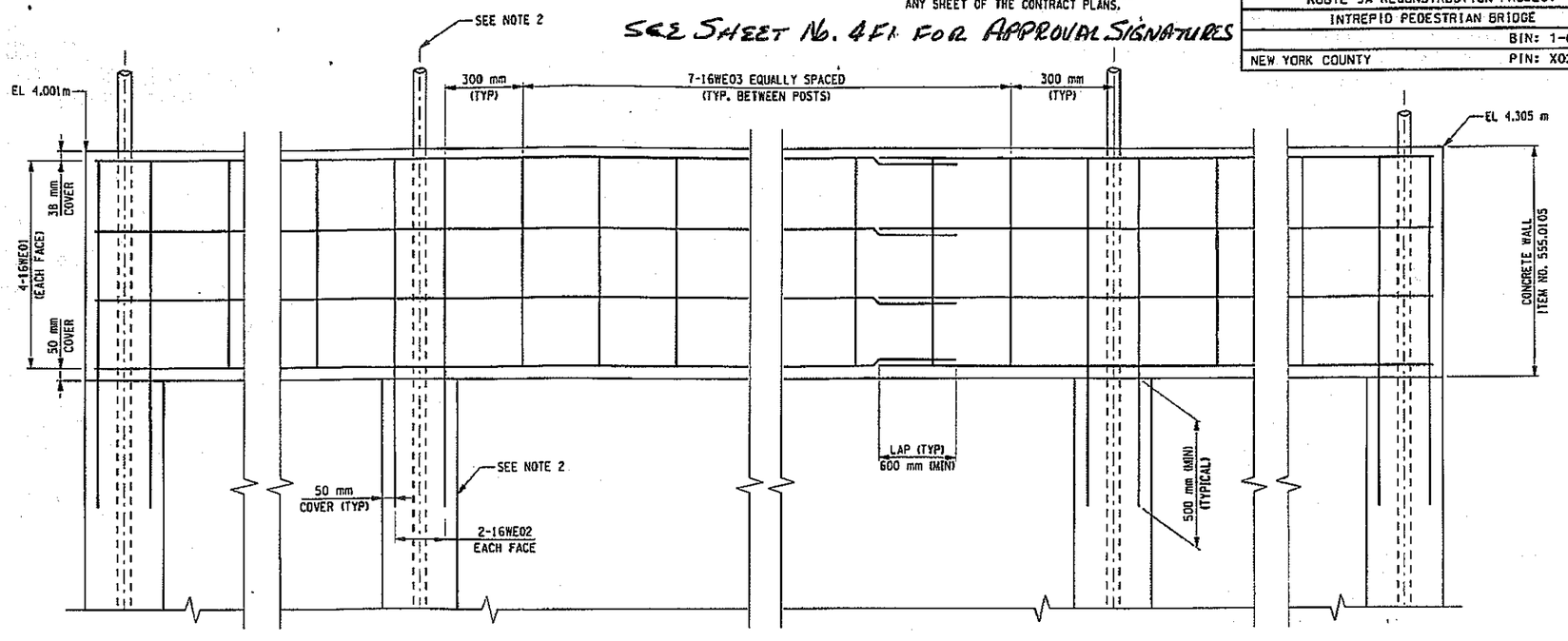
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

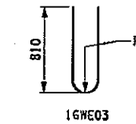
NEW YORK COUNTY PIN: X024.22



SECTION
SCALE 1:10



ELEVATION
SCALE 1:10



DIMENSIONS ARE OUT TO OUT

ITEM NO. 556.0202M

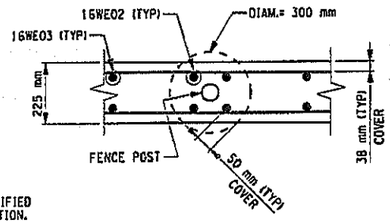
MARK	SIZE	LENGTH	NO REQ'D	TYPE	WEIGHT
16WE01	16	7900	32	STR	392
16WE02	16	1370	52	STR	111
16WE03	16	1900	84	SHOWN	248

BAR SCHEDULE

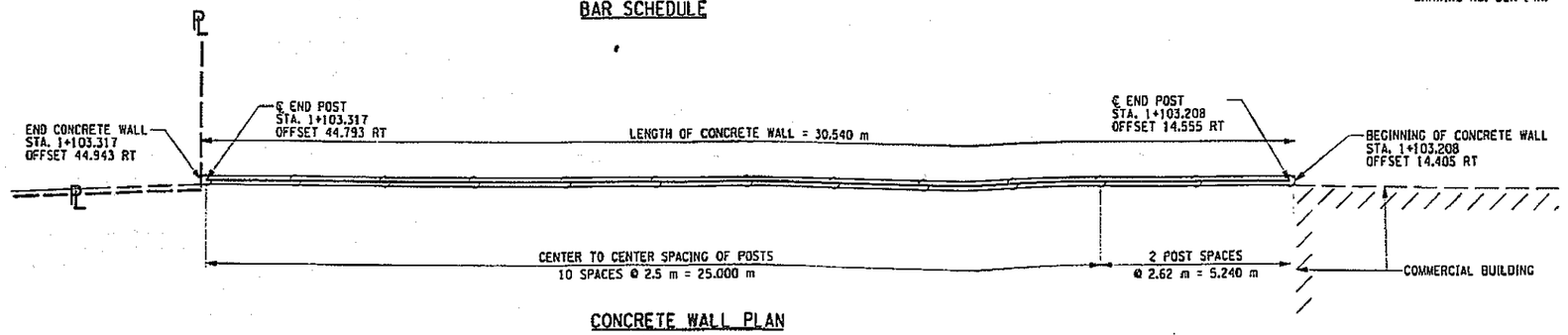
ITEM NO.	DESCRIPTION	QUANTITY
556.0202M	EPOXY-COATED BAR REINFORCEMENT FOR STRUCTURES	751 KG
555.0105M	CONCRETE FOR STRUCTURES, CLASS A	6.2 CM
203.02M	UNCLASSIFIED EXCAVATION AND DISPOSAL	3.1 CM

NOTES

1. ALL DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION AND INSTALLATION.
2. FOR FENCE AND CONCRETE BASE, SEE DRAWING NO. BLA-14A.



PLAN - POST DETAIL
SCALE 1:10



CONCRETE WALL PLAN
SCALE 1:75

AS-BUILT REVISIONS

SIGNATURE DATE

MISCELLANEOUS DETAILS - 9
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
BLA-14B	AUGUST 2002	AS NOTED	

DESIGNED BY: JD
DRAFTED BY: AR
CHECKED BY: JD
ESTIMATED BY:
CHECKED BY: AC
IN CHARGE OF: NS

USER
AUGUST 2002
X02422H.MDT

0258583

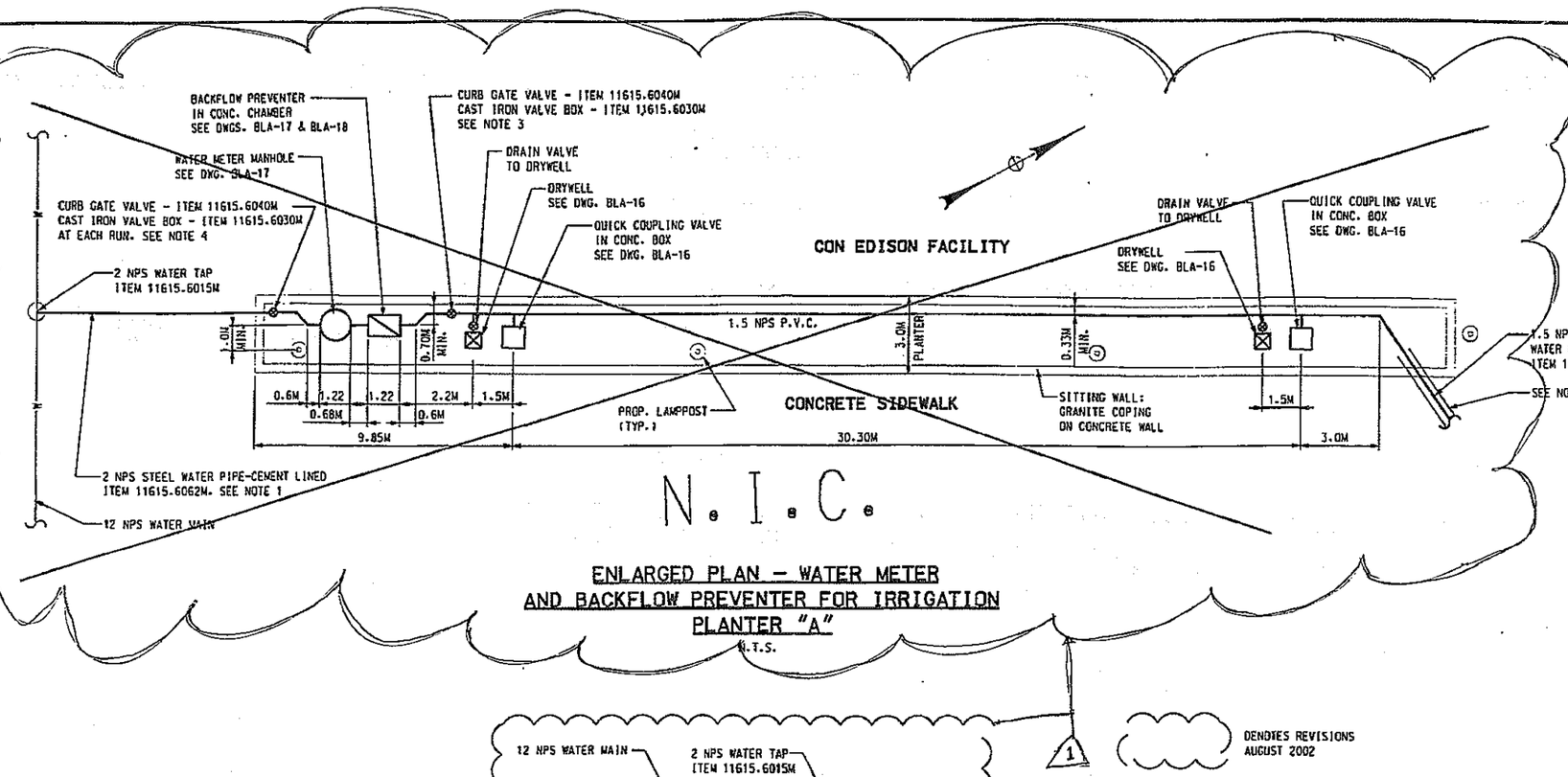
0258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		129F1 R	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

FIELD CHANGE SHEET

THIS SHEET, 129F1, SUPERSEDES SHEET 129.

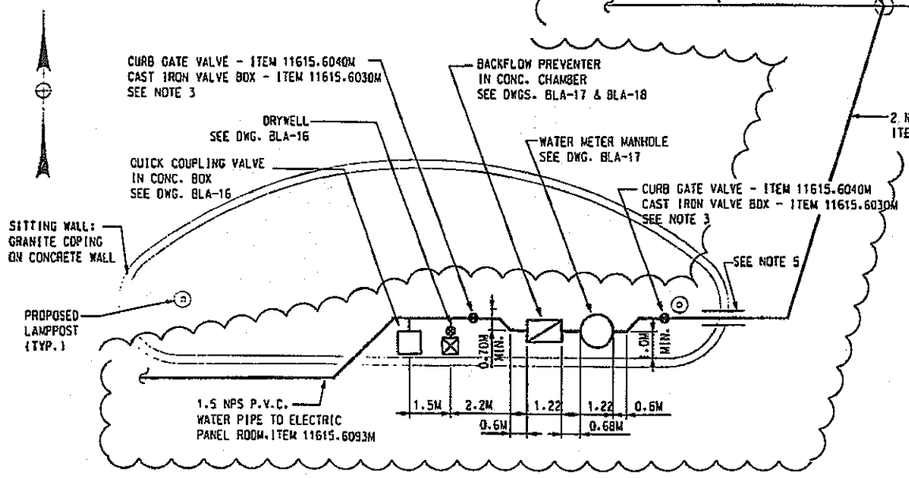
See Sheet No. 4F1 for Approval Signatures



N. I. C.

ENLARGED PLAN – WATER METER AND BACKFLOW PREVENTER FOR IRRIGATION PLANTER "A"

N.T.S.



ENLARGED PLAN – WATER METER AND BACKFLOW PREVENTER FOR IRRIGATION PLANTER "B"

N.T.S.

LEGEND

- □ – QUICK COUPLING VALVE WITH CHAMBER ITEM 11615.6020M
- ● – 2 N.P.S CURB GATE VALVE. ITEM 11615.6040M WITH CAST IRON VALVE BOX. ITEM 11615.6030M
- ⊗ – DRYWELL WITH VALVE ITEM (SEE DETAIL DWG. BLA-16)
- ▨ – BACKFLOW PREVENTER IN CONC. CHAMBER ITEM 11615.6090M
- ○ – WATER METER W/REMOTE READING DEVICE ITEM 11615.6070M AND WATER METER STRUCTURE. ITEM 11615.6080M

NOTES

1. ALL PIPING FROM THE WATER TAP TO THE GATE VALVE AFTER THE BACKFLOW PREVENTER SHALL BE STEEL WATER PIPE - CEMENT LINED 2 N.P.S. DIA., ITEM 11615.6062M.
2. "P.V.C." INDICATES POLYVINYL CHLORIDE PIPE - ITEM 11615.6093M AND ITEM 11615.609250M.
3. GATE VALVES SHALL BE 2 NPS.
4. ALL IRRIGATION PIPING SHALL BE PITCHED TOWARDS DRYWELL.
5. PROVIDE 3 NPS SLEEVE (RIGID PLASTIC CONDUIT CLASS 1. -ITEM 680.520508M) EXTEND THROUGH CONCRETE WALL.
6. FOR ITEM NUMBERS AND DESCRIPTIONS SEE DWG. BLA-18.

REFERENCES

	DWG. NO.
1. QUICK COUPLER	BLA-16
2. DRAINS	BLA-16
3. WATER METER	BLA-17
4. BACKFLOW PREVENTER	BLA-17 AND BLA-18
5. WATERMAIN AND IRRIGATION PLAN	BLA-5

AS-BUILT REVISIONS

1 CLOUDED AREA SHOWES CHANGES. OVER CONTRACT SHEET # 129

No Revisions of this sheet in the Engineer's record drawings.

SIGNATURE DATE

REVISIONS ONLY EARTH TECH A SAIPEM INTERNATIONAL LTD. COMPANY

Lilko Kassner, Inc.

IRRIGATION DETAILS - 1 BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-15	DEC 2000	NTS	EARTH TECH

DESIGNED BY: SH/MB CHECKED BY: KH
DRAFTED BY: MC/MB/SH CHECKED BY: GK
ESTIMATED BY: SH/MB CHECKED BY: KH
IN CHARGE OF: RP

DECEMBER 2000
X024224.MCT

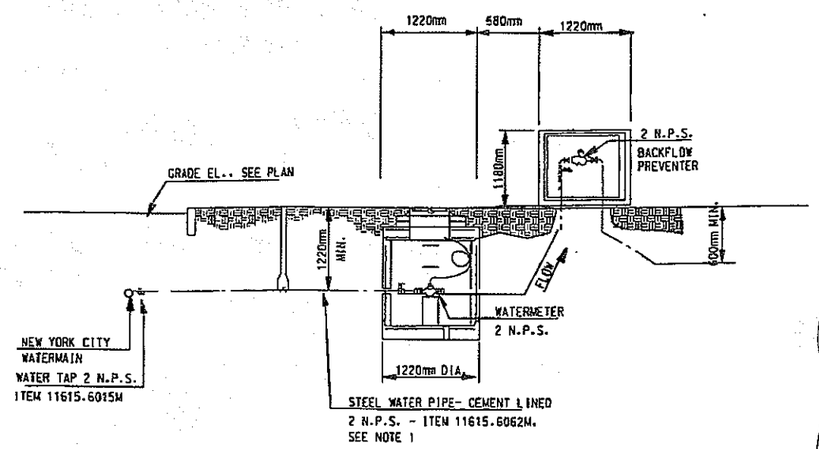
0258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		130F1	R 142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

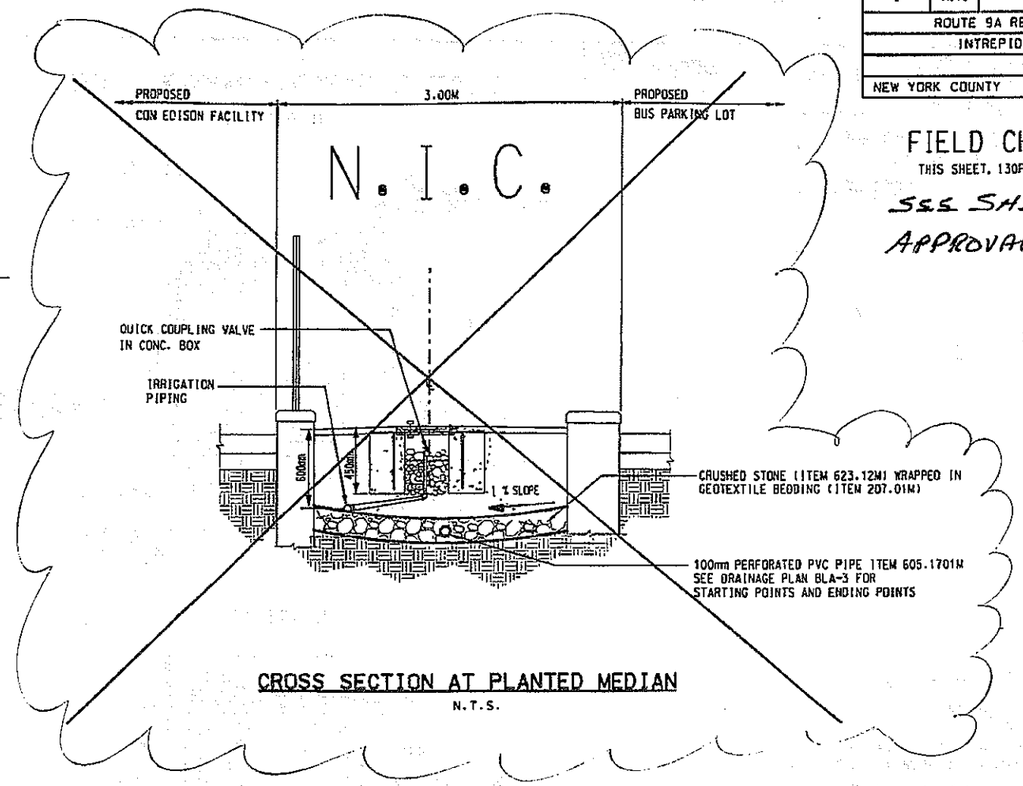
FIELD CHANGE SHEET

THIS SHEET, 130F1, SUPERSEDES SHEET 130.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

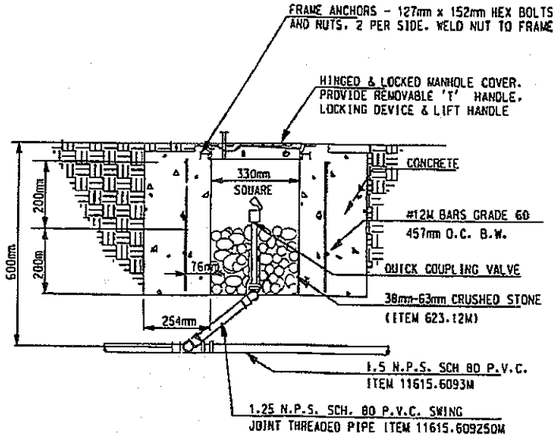


SECTIONAL VIEW OF WATERMETER AND BACKFLOW PREVENTER - SCHEMATIC



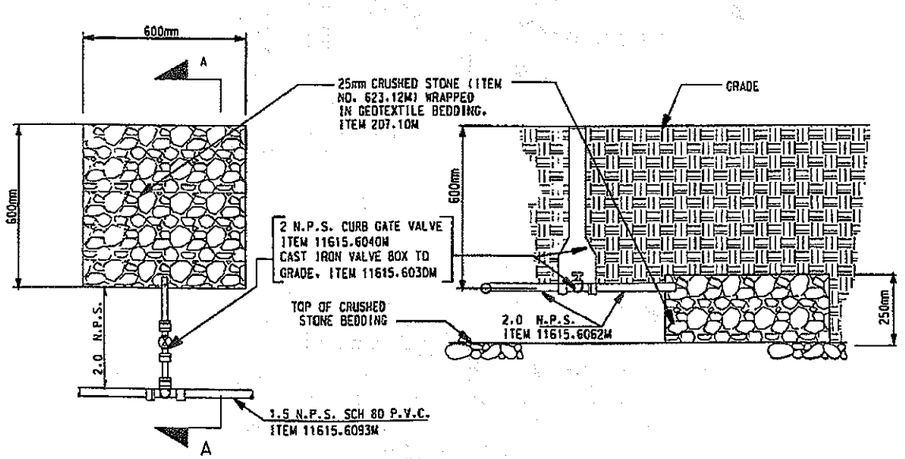
CROSS SECTION AT PLANTED MEDIAN

N.T.S.



QUICK COUPLING VALVE IN BOX

ITEM 11615.6020M
N.T.S.



PLAN

SECTION A-A

DRAIN TO DRYWELL

N.T.S.

NOTE

1. ALL PIPING FOR THE WATER LINE DRAIN FROM THE 2 N.P.S. X 1.5 N.P.S. TEE TO THE DRYWELL SHALL BE CEMENT LINED STEEL WATER PIPE.
2. FOR ITEM NUMBERS AND DESCRIPTIONS SEE DWG. BLA-18.

AS-BUILT REVISIONS

1 CROSS-SECTION WITHIN CLOUDED AREA IS NOT IN CONTRACT.

SIGNATURE DATE

IRRIGATION DETAILS - 2
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-16	DEC 2000	N.T.S.

LiRo-Kassner, Inc.

EARTH TECH

ESTIMATED BY: SH/MB CHECKED BY: GK DRAFTED BY: MC/MB/SH CHECKED BY: KH DESIGNED BY: SH/MB CHECKED BY: RP IN CHARGE OF:

USER DECEMBER 2000 X02422B.WDT

0258583

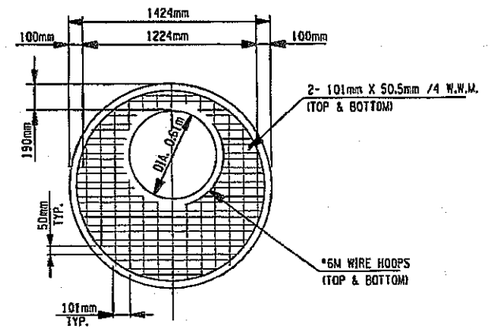
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	131	142

ROUTE 9A RECONSTRUCTION PROJECT

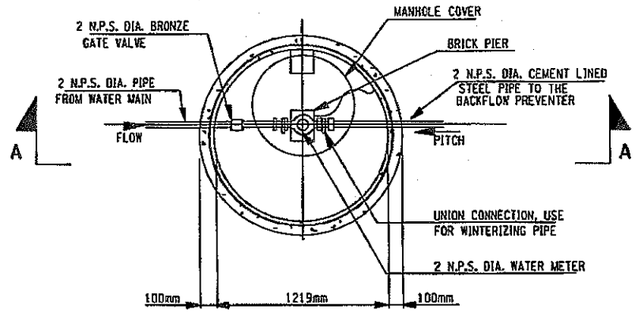
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

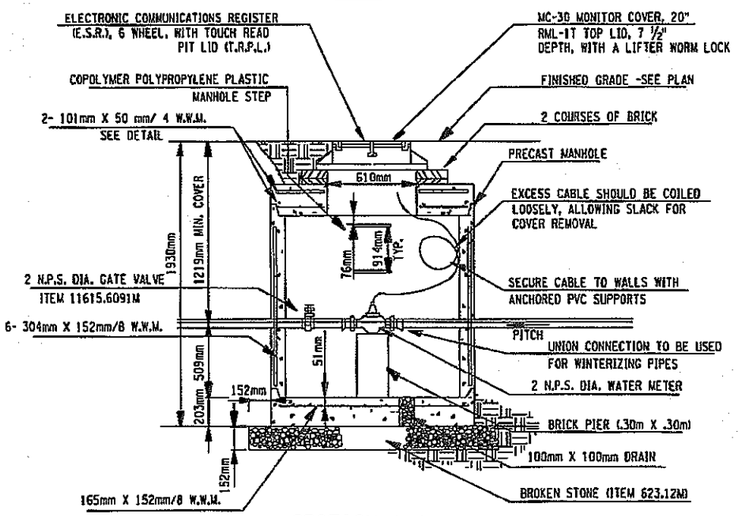
NEW YORK COUNTY PIN: X024.22



PRECAST CONCRETE TOP SLAB FOR WATER METER MANHOLE PLAN VIEW DETAIL

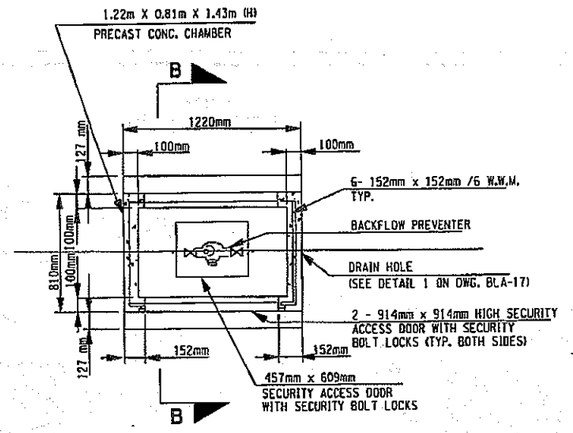


PLAN

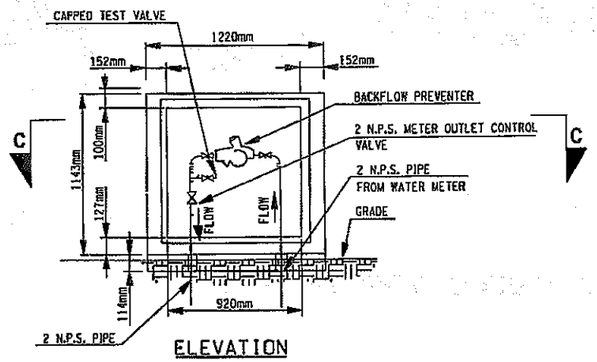


SECTION A-A

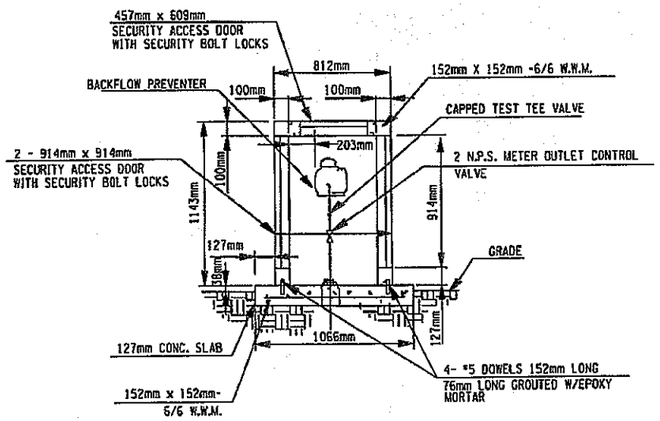
WATER METER INSTALLATION DETAILS



PLAN VIEW C-C



ELEVATION



SECTION B-B

BACKFLOW PREVENTER CHAMBER DETAILS

NOTES:

1. THE WATER METER WITH REMOTE READING DEVICE SHALL BE PAID FOR UNDER ITEM 11615.6070M.
2. THE PRECAST WATER METER STRUCTURE SHALL BE PAID FOR UNDER ITEM 11615.6080M.
3. THE BACKFLOW PREVENTER AND PRECAST CONCRETE CHAMBER SHALL BE PAID FOR UNDER ITEM 11615.6090M.
4. 2 N.P.S. GATE VALVE IN WATER METER MANHOLE SHALL BE PAID FOR UNDER ITEM NO. 11615.6091M.
5. FOR ITEM NUMBERS AND DESCRIPTIONS SEE DWG. BLA-18.

AS-BUILT REVISIONS

SIGNATURE DATE

IRRIGATION DETAILS - 3
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-17	DEC 2000	N.T.S.

LiRo-Kassner, Inc.

EARTH TECH

ESTIMATED BY: SH/MB CHECKED BY: GK DRAFTED BY: MC/MB/SH CHECKED BY: KH DESIGNED BY: SH/MB CHECKED BY: KH IN CHARGE OF: RP

USER: 200
MAY 200
X02422C.WDT

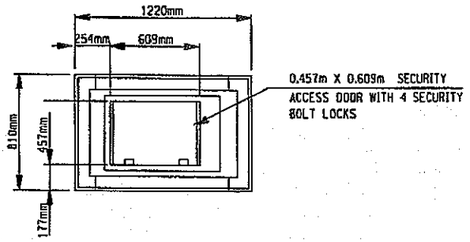
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.	D258583	132	142

ROUTE 9A RECONSTRUCTION PROJECT

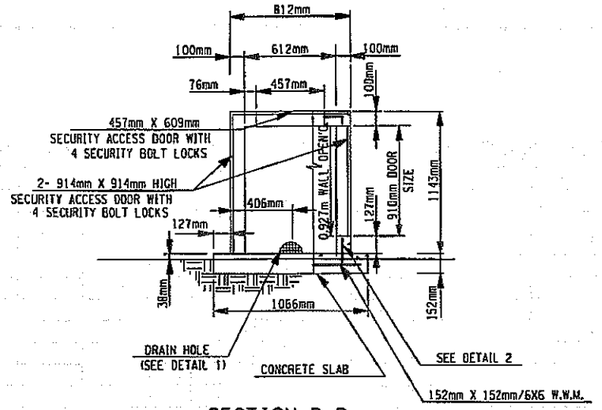
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

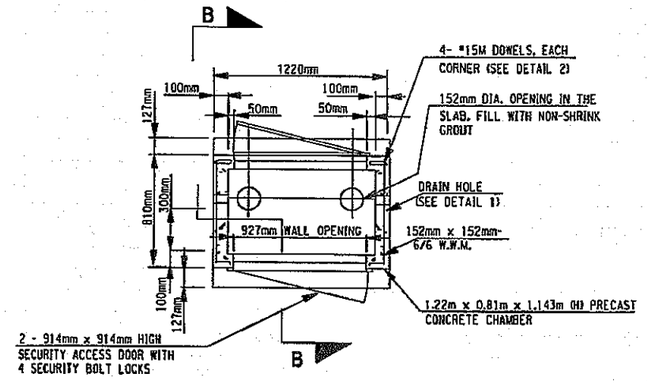
NEW YORK COUNTY — PIN: X024.22



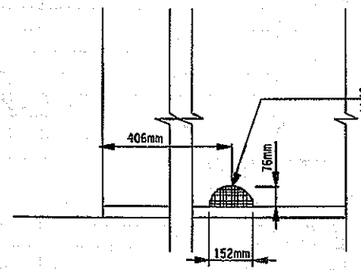
PLAN



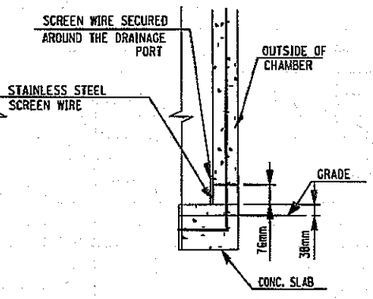
SECTION B-B



PLAN VIEW A-A



OUTSIDE VIEW



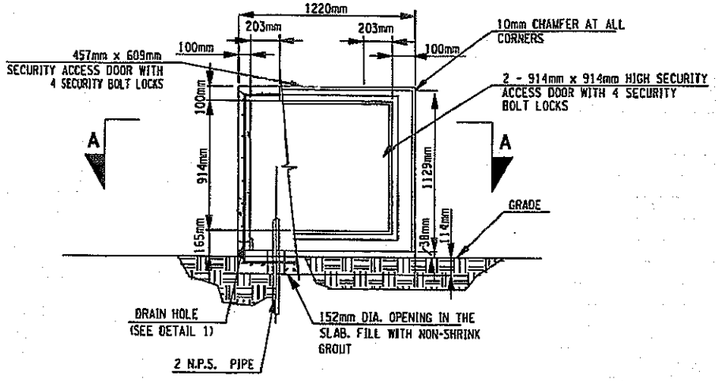
CROSS-SECTION

DETAIL 1 - DRAIN HOLE DETAIL

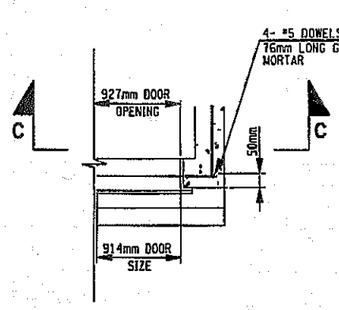
ITEM DESCRIPTION FOR IRRIGATION WORK		
ITEM NO.	DESCRIPTION	UNITS
11615.6015M	2 N.P.S. WATER TAP	EA
11615.6020M	QUICK COUPLING VALVE WITH CHAMBER	EA
11615.6030M	CAST IRON VALVE BOX - 5.25 N.P.S.	EA
11615.6040M	CURB GATE VALVE - 2 N.P.S.	EA
11615.6052M	CEMENT LINED STEEL WATER PIPE - 2 N.P.S.	LM
11615.6070M	WATER METER WITH REMOTE READING DEVICE - 1.5 N.P.S.	EA
11615.6080M	PRECAST WATER METER STRUCTURE	EA
11615.6090M	1.5 N.P.S. BACKFLOW PREVENTOR WITH CHAMBER	EA
11615.6091M	GATE VALVE 2 NPS	EA
11615.609250M	M - POLYVINYL CHLORIDE (P.V.C.) PIPE - 1.25 N.P.S.	LM
11615.6093M	M - POLYVINYL CHLORIDE (P.V.C.) PIPE - 1.5 N.P.S.	LM

NOTE:

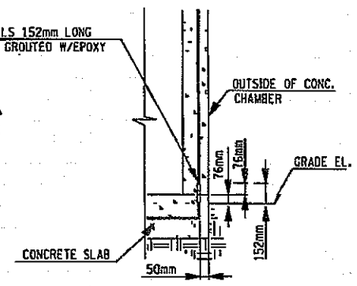
1. THE BACKFLOW PREVENTER AND PRECAST CONCRETE CHAMBER SHALL BE PAID FOR UNDER ITEM 11615.6090M.



SECTION/ELEVATION



PLAN



SECTION C-C

DETAIL 2 - CONCRETE CHAMBER DETAILS

BACKFLOW PREVENTER ENCLOSURE AND PRECAST CONCRETE CHAMBER DETAILS

AS-BUILT REVISIONS

SIGNATURE — DATE

IRRIGATION DETAILS - 4
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE
BLA-18	DEC 2000	N.T.S.

LiRo-Kassner, Inc.

EARTH TECH

ESTIMATED BY: SH/MB — CHECKED BY: KH — DRAFTED BY: MC/MB/SH — CHECKED BY: GK — DESIGNED BY: SH/MB — CHECKED BY: KH — IN CHARGE OF: RP

USER
MAY 20
X02422D.WDT

TABLE OF PROPOSED LIGHTING WORK FOR BUS LAYOVER AREA (SEE NOTE 6)

FROM POLE/BOX I.D.	APPROX. CENTERLINE STATION	OFFSET & SIDE	PHASE	CIRCUIT	TO POLE/BOX I.D.	FOUNDATION ITEM 670.0111M F.ND. NYCDOT TYPE B (EACH)	FOUNDATION ITEM 670.0112M F.ND. NYCDOT TYPE M (EACH)	LAMPPOST ITEM 11670.1080M TYPE M LAMPPOST (EACH)	LAMPPOST ITEM (11670.1593OM TYPE B-1-2 LAMPPOST) (EACH)	LUMINAIRE ITEM 11670.5110M 250W HPS, TEARDROP LUMINAIRE (EACH)	LUMINAIRE ITEM 11670.5117M 100W LUMINAIRE (EACH)	CONDUIT ITEM 11660.0106M CONDUIT, HOT DIPPED GALV. STEEL 2 N.P.S. (METER)	CONDUCTOR ITEM 11661.0305M NO. 6 AWG CONDUCTOR (METER)	CONDUCTOR 11661.0306M NO. 2 AWG CONDUCTOR (METER)	ITEM 10206.0301M CONDUIT EXCAV. BACKFILL (METER)	PULL BOXES ITEM 11660.0810M CONC. BOX TYPE 3618 (EACH)	PULL BOXES ITEM 11660.0812M CONC. BOX TYPE 4824 (EACH)	PHOTO ELECTRIC CONTROL ITEM 11670.6001M FURNISH P.E.C. (EACH)	PHOTO ELECTRIC CONTROL ITEM 11670.6002M INSTALL P.E.C. (EACH)	REMARKS
B1	1+102.3	43.9M R	B	2	PB1	1			1		1	3	8		3					
M1	1+088.4	35.6M R	C	3	PB1		1	1		1		14	30		14					
PB1	1+100.1	42.0M R			PB2							14		44	14	1				
B2	1+102.3	29.2M R	C	3	PB2	1			1		1	4	10		4					
M2	1+088.6	21.3M R	B	2	PB2		1	1		1		13	28		13					
PB2	1+100.1	27.4M R			PB3							14		58	14	1				
B3	1+102.3	14.6M R	A	1	PB3	1			1		1	4	10		4					
M3	1+090.7	8.0M R	A	1	PB3		1	1		1		11	24		11					
PB3	1+100.1	12.6M R			PB4							20		82	20	1				
B4	1+102.3	0.1M L	B	2	PB4	1			1		1	13	28		1					TRENCH CONTAINS 12M OF COMMON TRENCH
B5	1+102.3	14.7M L	C	3	PB4	1			1		1	7	16		7					
PB4	1+100.1	8.0M L			PB5							11		46	5	1				TRENCH CONTAINS 6M OF COMMON TRENCH
PB5	1+095.4	14.7M L			PB6							2X12=24		50	12	1				COMMON TRENCH FOR TWO CONDUITS
B6	1+082.0	14.5M L	A	1	PB6	1			1		1	1	4		1					
PB6	1+083.0	14.5M L			PB7							18		74	18	1				
B7	1+075.7	12.0M L	B	2	PB7	1			1		1	10	22		10					
B8	1+062.1	6.1M L	C	3	PB7	1			1		1	5	12		5					
PB7	1+067.6	5.3M L			PB12							30		122	30	1				TRENCH CONTAINS 20M OF COMMON TRENCH
B9	1+055.8	42.2M R	B	2	PB8	1			1		1	3	8		3					
M4	1+065.2	36.0M R	C	3	PB8		1	1		1		10	22		10					
PB8	1+056.6	39.9M R			PB9							13		41	13	1				
B10	1+055.8	31.3M R	A	1	PB9	1			1		1	6	14		6					
M5	1+065.1	21.7M R	B	2	PB9		1	1		1		9	20		9					
PB9	1+056.6	25.9M R			PB10							13		54	13	1				
B11	1+055.8	20.0M R	C	3	PB10	1			1		1	8	18		8					
M6	1+065.1	7.6M R	A	1	PB10		1	1		1		2X9=18	47		9			3	3	COMMON TRENCH FOR TWO CONDUITS P.E.C. FOR ALL PHASES
PB10	1+056.6	11.5M R			PB20							82	126	168	16	1				TRENCH CONTAINS 20M OF COMMON TRENCH
B12	1+053.2	2.0M L	B	2	PB15	1			1		1	15	32		15					TRENCH CONTAINS 10M OF COMMON TRENCH
B13	1+039.8	8.0M L	A	1	PB15	1			1		1	2	6		2					
B14	1+033.8	42.1M R	C	3	PB11	1			1		1	6	14		6					
PB11	1+040.2	42.1M R			PB12							11		24	11	1				
B15	1+033.8	31.2M R	B	2	PB12	1			1		1	6	14		6					
M7	1+041.4	34.2M R	C	3	PB12		1	1		1		3	8		3					
PB12	1+040.2	31.2M R			PB13							13		56	13	1				
B16	1+033.8	20.0M R	A	1	PB13	1			1		1	7	16		7					
M8	1+041.4	19.6M R	B	2	PB13		1	1		1		2	6		2					
PB13	1+040.2	17.8M R			PB14							13		56	13	1				
B17	1+033.8	5.9M R	C	3	PB14	1			1		1	7	16		7					
M9	1+045.4	4.6M R	A	1	PB14		1	1		1		7	16		7					
PB14	1+040.2	4.0M R			PB15							8		36		1				
PB15	1+042.4	4.0M L			PB20							8		36		1				INCLUDED UNDER COMMON TRENCH PB7 TO PB20
PB16	1+070.6	44.2M R			PB17							12			12	1				
PB17	1+056.2	44.2M R			PB19							50			4	1				TRENCH CONTAINS 46M OF COMMON TRENCH
PB18	1+083.2	15.6M L			PB19							26			26	1				
PB19	1+058.6	5.2M L			PB20							26				1				TRENCH CONTAINS 26M OF COMMON TRENCH
PB20	1+032.2	4.4M L			ELEC. PANEL							20	14	50	5		1			SEE NOTE 5
					BUS LAYOVER AREA TOTALS:	17	9	9	17	9	17	620	589	997	422	19	1	3	3	

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		133F1 R	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 133F1, SUPERSEDES SHEET 133.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

NOTES:

1. FOR PLAN LOCATIONS OF BUS LAYOVER AREA ELECTRICAL WORK, SEE DWG. BLA-9.
2. IF FIELD CONDITIONS DIFFER FROM THAT SHOWN IN THE TABLE AND ON THE GENERAL PLAN, THE CONTRACTOR SHALL BRING SUCH INFORMATION TO THE ATTENTION OF THE ENGINEER AND PROCEED WITH THE WORK AS ORDERED BY THE ENGINEER.
3. SEE DWG. L-8 FOR ELECTRICAL PANEL REQUIREMENTS AND PANEL DIAGRAM (PANEL "A").
4. FOR ELECTRICAL/LIGHTING WORK INCLUDING PLAN, DETAILS AND TABLE FOR THE RELOCATION OF TYPE "M" LIGHT POLE ALONG N/B ROUTE 9A, SEE DWG. DU-4.

DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1 CLOUDED AREAS DENOTES REVISION, ALSO SEE SHEETS 133F2 & 133F3

SIGNATURE DATE

REVISIONS ONLY

EARTH TECH

A TYLIN INTERNATIONAL LTD. COMPANY

LiRo-Kassner, Inc.

DRAINAGE & LIGHTING TABLES
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-19	DEC 2000	N.T.S.	EARTH TECH

ESTIMATED BY: SH/MB CHECKED BY: KH DRAFTED BY: MC/MB/SH CHECKED BY: GK DESIGNED BY: SH/MB CHECKED BY: KH IN CHARGE OF: RP

DECEMBER 2000
133-22M, M15

0258583

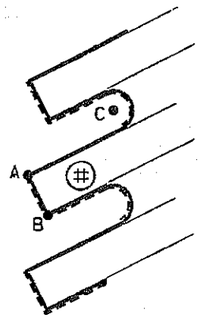
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		133F2	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
				BIN: 1-07789-0
NEW YORK COUNTY				PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 133F2, DOES NOT SUPERSEDE ANY SHEET OF THE CONTRACT PLANS.

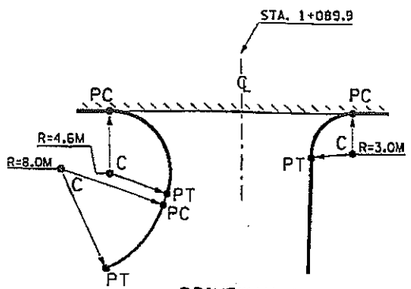
See Sheet No. 4F1 for Approval Signatures

PARKING SPACE	A		B		C		REMARKS
	STATION	OFFSET	STATION	OFFSET	STATION	OFFSET	
1	1+058.500	12.679 RT	1+059.998	15.627 RT	1+065.020	7.692 RT	
2	1+058.441	19.794 RT	1+059.939	22.742 RT	1+064.705	14.924 RT	
3	1+058.427	26.883 RT	1+059.923	29.830 RT	1+064.691	22.017 RT	
4	1+058.410	33.969 RT	1+059.908	36.917 RT	1+064.721	29.079 RT	
5	1+058.401	41.059 RT	1+060.004	44.214 RT	1+064.871	36.086 RT	
6	1+098.549	6.945 RT	1+096.968	9.785 RT	1+097.435	2.866 RT	
7	1+098.409	15.695 RT	1+096.828	16.943 RT	1+090.939	8.150 RT	
8	1+098.284	21.272 RT	1+096.702	24.111 RT	1+089.059	14.324 RT	
9	1+098.128	28.426 RT	1+096.547	31.265 RT	1+088.933	21.492 RT	
10	1+097.995	35.509 RT	1+096.386	38.392 RT	1+088.778	28.646 RT	
11	1+096.407	41.840 RT	1+094.799	44.727 RT	1+088.697	35.794 RT	
12	-	-	-	-	-	-	PAINTED PARKING SPACE
13	-	-	-	-	-	-	PAINTED PARKING SPACE
14	-	-	-	-	-	-	PAINTED PARKING SPACE
15	-	-	-	-	-	-	PAINTED PARKING SPACE

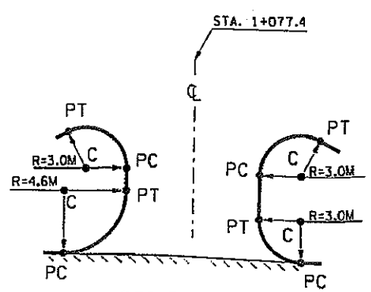


TYPICAL PARKING SPACE REFERENCE POINTS

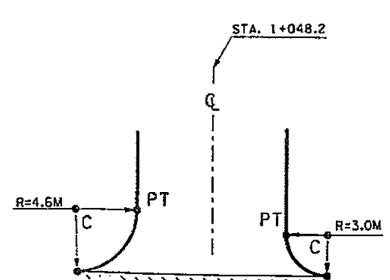
DRIVEWAY	RADIUS	PC		PT		C	
		STATION	OFFSET	STATION	OFFSET	STATION	OFFSET
1	4.6M	1+079.653	20.300 LT	1+084.066	14.219 LT	1+079.711	15.700 LT
	8.0M	1+083.790	13.410 LT	1+079.504	8.692 LT	1+076.216	15.985 LT
	3.0M	1+097.838	20.383 LT	1+094.839	17.086 LT	1+097.832	17.377 LT
2	4.6M	1+067.878	48.952 RT	1+072.533	44.361 RT	1+067.933	44.352 RT
	3.0M	1+072.555	42.766 RT	1+068.225	40.036 RT	1+069.555	42.725 RT
	3.0M	1+085.557	49.240 RT	1+082.512	46.228 RT	1+085.518	46.233 RT
	3.0M	1+082.554	42.987 RT	1+086.961	40.364 RT	1+085.554	43.013 RT
3	4.6M	1+038.209	48.603 RT	1+042.670	44.013 RT	1+038.070	44.005 RT
	3.0M	1+056.631	48.818 RT	1+053.667	45.813 RT	1+056.667	45.818 RT



DRIVEWAY 1
W. 46TH STREET



DRIVEWAY 2
W. 45TH STREET EAST



DRIVEWAY 3
W. 45TH STREET WEST

NOTES:

1. FOR PLAN LOCATION OF GRANITE CURB, SEE DWG. BLA-1.
2. ALL STATIONING REFERS TO INTREPID BRIDGE STATION LINE.

AS-BUILT REVISIONS

SIGNATURE DATE

GRANITE CURB LAYOUT TABLES BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-19A	AUGUST 2002	N.T.S.	EARTH TECH

D258583

DESIGNED BY: AR CHECKED BY: NS
DRAFTED BY: SC/AR/JE CHECKED BY: NS
ESTIMATED BY: JE/AR CHECKED BY: NS
IN CHARGE OF: NS

USER
AUGUST 2002
X02422C.MTB

D258583

D258583

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		133F3 R1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

FIELD CHANGE SHEET

THIS SHEET, 133F3, SUPERSEDES SHEET 133.

SEE SHEET 4F1 FOR APPROVAL SIGNATURES

TABLE OF PROPOSED DRAINAGE STRUCTURES

ID OF PROPOSED DRAINAGE STRUCTURE	APPROX. CENTERLINE STATION	OFFSET & SIDE	PROPOSED STRUCTURE			PROPOSED RIM. ELEV. (m)	PROPOSED INVERT (IN) ELEVATION (m)	PROPOSED INVERT (OUT) ELEVATION (m)	PROPOSED PIPE TYPE & DIA. (mm)	PROPOSED PIPE LENGTH (m)	STRUCTURE TIE-IN (ID NO.)	REMARKS
			DESCRIPTION	ITEM	QUANTITY							
D-1	1+047.7	3.2M L	CB-TYPE 2	11604.0202M	2.75M	3.17	N/A	1.860	DIP305	23.8	D-2	
D-2	1+071.3	0.5M R	CB-TYPE 2	11604.0202M	2.75M	3.35	1.740	1.640	DIP406	20.0	D-3	
D-3	1+071.3	20.5M R	CB-TYPE 2	11604.0202M	2.75M	3.14	1.540	1.540	DIP406	19.0	D-5	
D-4	1+083.1	39.8M R	CB-TYPE 2	11604.0202M	2.75M	3.06	N/A	1.680	DIP305	12.2	D-5	
D-5	1+071.3	38.7M R	CB-TYPE 2	11604.0202M	2.75M	2.85	1.550 & 1.450	1.360	DIP406	7.0	D-6	
D-6	1+067.3	45.4M R	MH-TYPE A-1	11604.0485M	2.30M	3.00	1.285	0.810	DIP406	25.0	D-7	
D-7	1+042.2	45.2M R	MH-TYPE A-1	11604.0485M	2.49M	2.80	0.560 & 1.19	0.370	DIP406	9.0	D-8	
D-8 (EXIST.)	1+041.8	53.9M R	EXIST. BRICK MH	203.19M & 11604.0726M	1 EA.	N/A	0.310	N/A	N/A	N/A	N/A	SEE NOTE 3 & 4
D-9	1+043.5	14.8M L	CB-TYPE 2	11604.0202M	2.75M	3.30	N/A	2.05	DIP406	15.5	D-10	
D-10 (EXIST.)	1+029.0	20.9M L	EXIST. CB	203.19M & 11604.0726M	1 EA.	N/A	1.90	N/A	N/A	N/A	N/A	SEE NOTE 4
D-11	1+043.2	40.8 R	CB-TYPE 2	11604.0202M	2.75M	2.75	1.26	1.26	DIP406	4.0	D-7	
D-12	1+053.2	37.1 R	CB-TYPE 2	11604.0202M	2.75M	2.88	N/A	1.48	DIP406	11.0	D-11	

1

NOTES:

1. FOR DETAILS OF DRAINAGE WORK, SEE DWG. NOS. BLA-6 THRU BLA-9.
2. FOR DETAIL OF CONNECTION TO EXISTING MANHOLE SEE DWG. NO. BLA-9.
3. IF FIELD CONDITIONS DIFFER FROM THAT SHOWN IN THE TABLE AND ON THE GENERAL PLAN, THE CONTRACTOR SHALL BRING SUCH INFORMATION TO THE ATTENTION OF THE ENGINEER AND PROCEED WITH THE WORK AS ORDERED BY THE ENGINEER.

DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1 CLOUDED AREA DENOTES REVISION
ALSO SEE SHEETS [illegible]

SIGNATURE DATE

REVISIONS ONLY
EARTH TECH
A Tyco International Ltd. Company

LiRo-Kassner, Inc.

DRAINAGE TABLE
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO. BLA-19B	DATE DEC 2000	SCALE N.T.S.	EARTH TECH

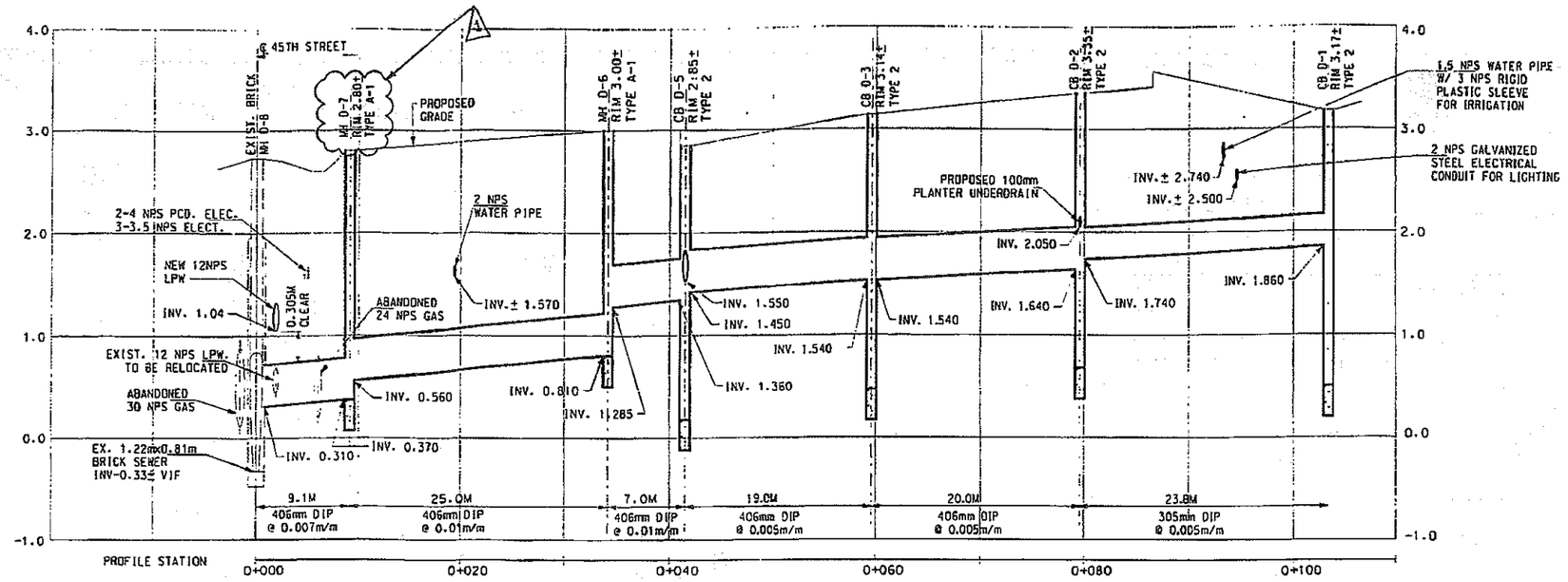
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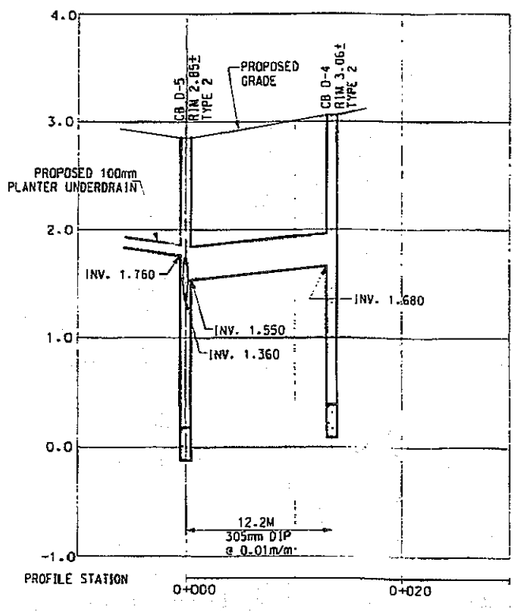
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DESIGNED BY: SH/MB
CHECKED BY: KH
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CHECKED BY: CK
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IN CHARGE OF: RP

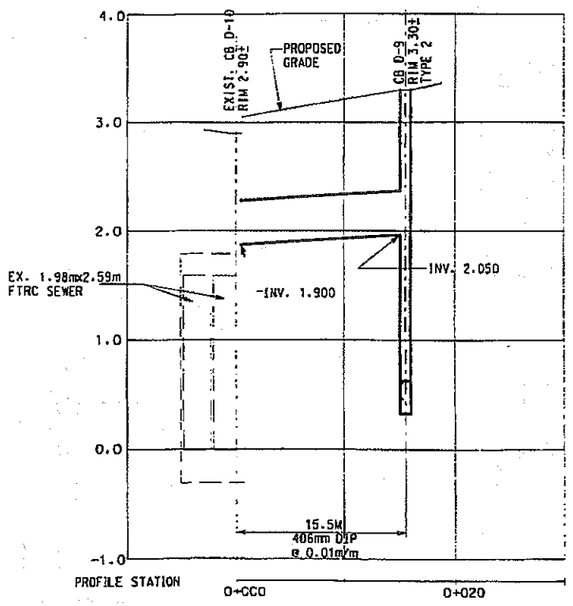
USER
DECEMBER 2000
X024220.MTB

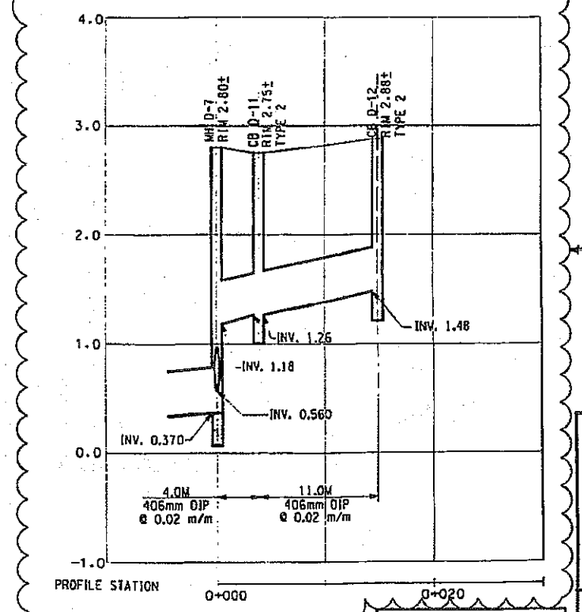
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D258583









PROFILE
PROPOSED STORM DRAIN @ PARKING LOT
SCALE: HORIZ. 1=250
VERT. 1=25

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		134F1 R1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY
PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 134F1, SUPERSEDES SHEET 134.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

NOTES:

1. PROFILE STATIONING SHOWN IS ALONG ℄ OF PROPOSED STORM SEWER.
2. THE DEPTH OF EXISTING WATER MAIN, ELECTRIC LINES AND ABANDONED GAS LINES AND SEWERS ARE APPROXIMATE. THE CONTRACTOR IS TO VERIFY ACTUAL LOCATION AND DEPTH IN FIELD BEFORE STORM DRAIN PLACEMENT AND REPORT FINDINGS IMMEDIATELY TO THE ENGINEER.
3. THE CONTRACTOR MUST PROVIDE CONTINUOUS SUPPORT AND PROTECTION FOR ALL EXISTING UTILITIES. THE CONTRACTOR WILL BE REQUIRED TO DESIGN AND IMPLEMENT SUPPORT SYSTEMS FOR CONTINUOUS SUPPORT OF THE EXISTING UTILITIES OVER THE UTILITY TRENCHES OF THE CONTRACT. THE CONTRACTOR MUST PROTECT EXISTING UTILITIES FROM PHYSICAL HARM DURING EXCAVATION. THE CONTRACTOR'S UTILITY SUPPORT DESIGNS AND CONSTRUCTION PROCEDURES WHEN INSTALLING ITEMS OF THE CONTRACT BELOW EXISTING UTILITIES AND UNDERGROUND STRUCTURES ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE ENGINEER. THE CONTRACTOR SPECIFICALLY AGREES THAT HE HAS INCLUDED IN HIS UNIT PRICE AND IN HIS LUMP SUM PRICES BID FOR THE ITEMS OF THE CONTRACT ANY ADDITIONAL COSTS OF DOING WORK UNDER THIS CONTRACT BECAUSE OF THE NEED TO DESIGN TEMPORARY UTILITY SUPPORT, PROTECT AND MAINTAIN THE UTILITIES WITHIN AND ADJACENT TO THE EXCAVATIONS OF THE CONTRACT. SEE THE NOTES IN THE CONTRACT DRAWINGS FOR ADDITIONAL REQUIREMENTS FOR UTILITY SUPPORT.

DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1 CLOUDED AREAS SHOWS REVISION OVER SHEET # 134

SIGNATURE DATE

REVISIONS ONLY EARTH TECH A TETRA TECH INTERNATIONAL LTD. COMPANY

LiRo·Kassner, Inc.

STORM DRAIN PROFILES
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
BLA-20	DEC 2000	AS SHOWN	EARTH TECH

DESIGNED BY: SH/MB CHECKED BY: KH DRAFTED BY: MC/MB/SH CHECKED BY: GK ESTIMATED BY: SH/MB CHECKED BY: RP IN CHARGE OF:

ASSEMBLED 2000
X22422A.PRO

D258583

D258583

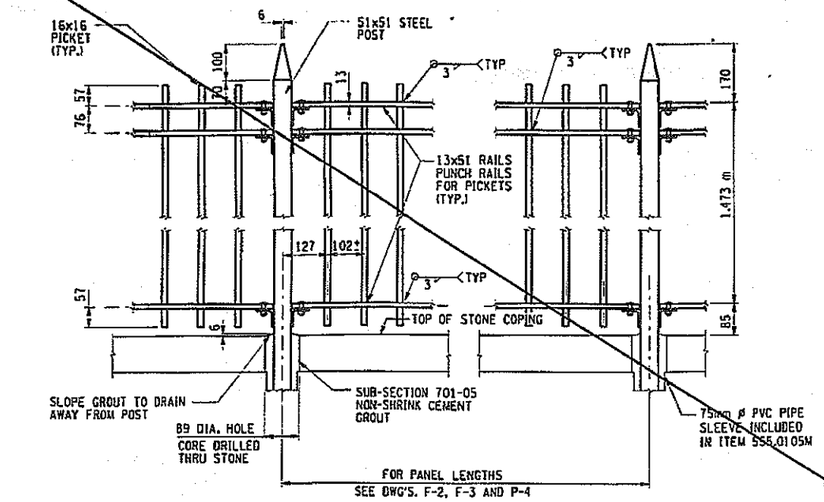
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		135F1	142

ROUTE 9A RECONSTRUCTION PROJECT
INTREPID PEDESTRIAN BRIDGE
BIN: 1-07789-0
NEW YORK COUNTY PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 135F1, SUPERSEDES SHEET 135.

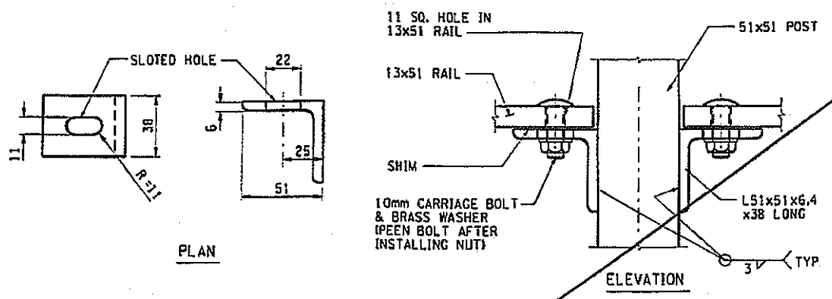
SEE SHEET No. 4F1
FOR APPROVAL SIGNATURES



TYPICAL FENCE ELEVATION

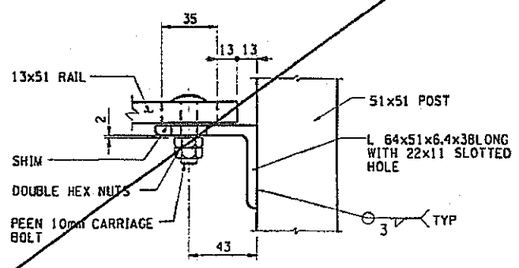
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NOTE: SPACE PICKETS EQUALLY EXCEPT THAT AT POSTS SPACE SHALL BE 127



TYPICAL CONNECTION DETAIL

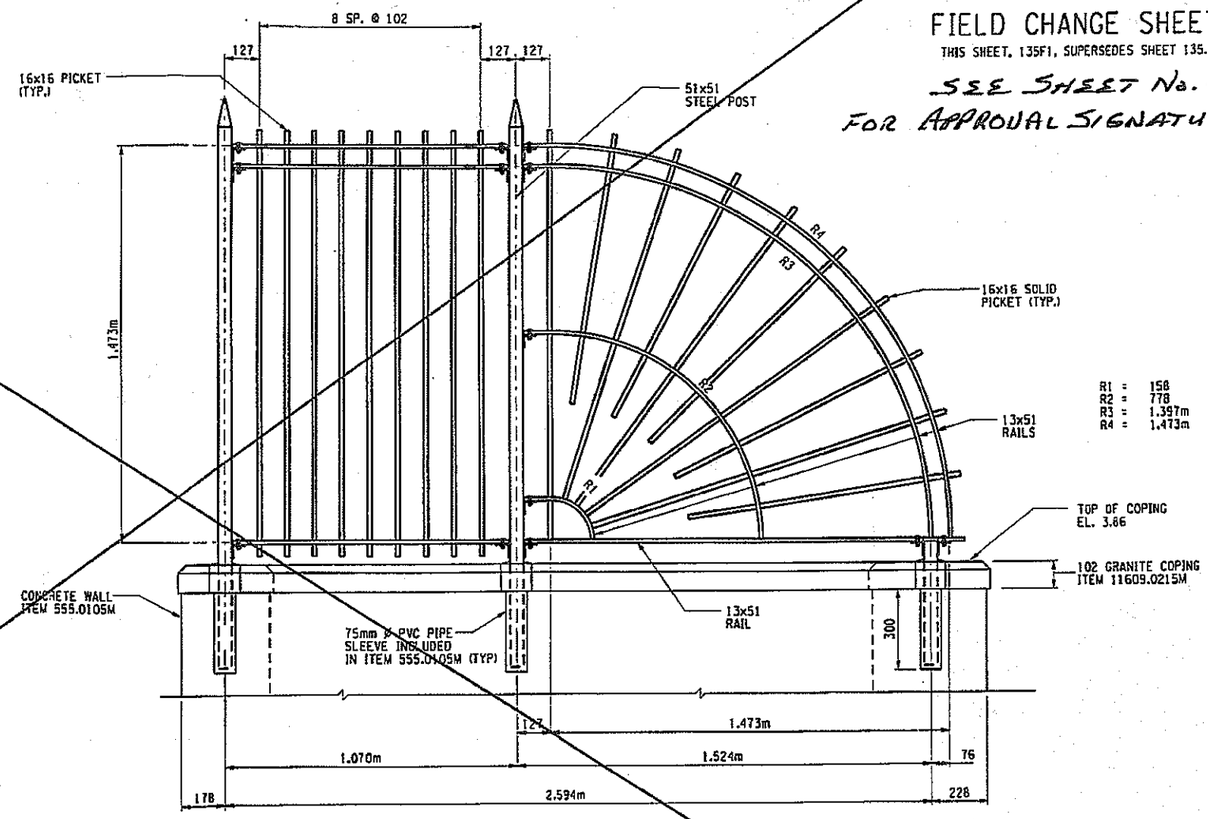
SCALE 1:2



EXPANSION JOINT CONNECTION DETAIL

SCALE 1:2

N.I.C.



ELEVATION - FENCE AND SITTING WALL

SCALE 1:10

NOTES:

1. FOR MOUNTING ON PLANTING BIN WALL SEE DWG'S P5 AND P6.
2. ALL FENCE POSTS AND ATTACHMENTS PAID UNDER ITEM 11607.9903M.
3. NON SHRINK GROUT SHALL BE PAID FOR UNDER ITEM 555.0105M.
4. GRANITE COPING SHALL BE DEER ISLE GRANITE WITH THERMAL FINISH. SECTIONS SHALL BE NO GREATER IN LENGTH THAN 1.524m NOR LESS THAN 1.000m.
5. FOR SITE PLAN SEE DRAWING TD-4 AND P-1.
6. FENCE SHALL BE PAINTED. INCLUDED IN ITEM 11607.9903M. COLOR SHALL BE FEDERAL STANDARD COLOR #17778.
7. ALL BARS, PLATES AND POSTS SHALL BE A709 GRADE 345.

AS-BUILT REVISIONS

SIGNATURE DATE

DECORATIVE FENCE DETAILS 1
BUS LAYOVER AREA AT 46TH STREET

BARBARA THAYER, P.C.
220 WEST 42ND STREET NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
F-1	DEC. 2000	AS SHOWN	EARTH TECH

D258583

DESIGNED BY: CF, AS
CHECKED BY: JV
DRAFTED BY: EL, RM, JV
CHECKED BY: JV, FS
ESTIMATED BY: JV, FS
IN CHARGE OF: BT

D258583

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		136F1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 136F1, SUPERSEDES SHEET 136.

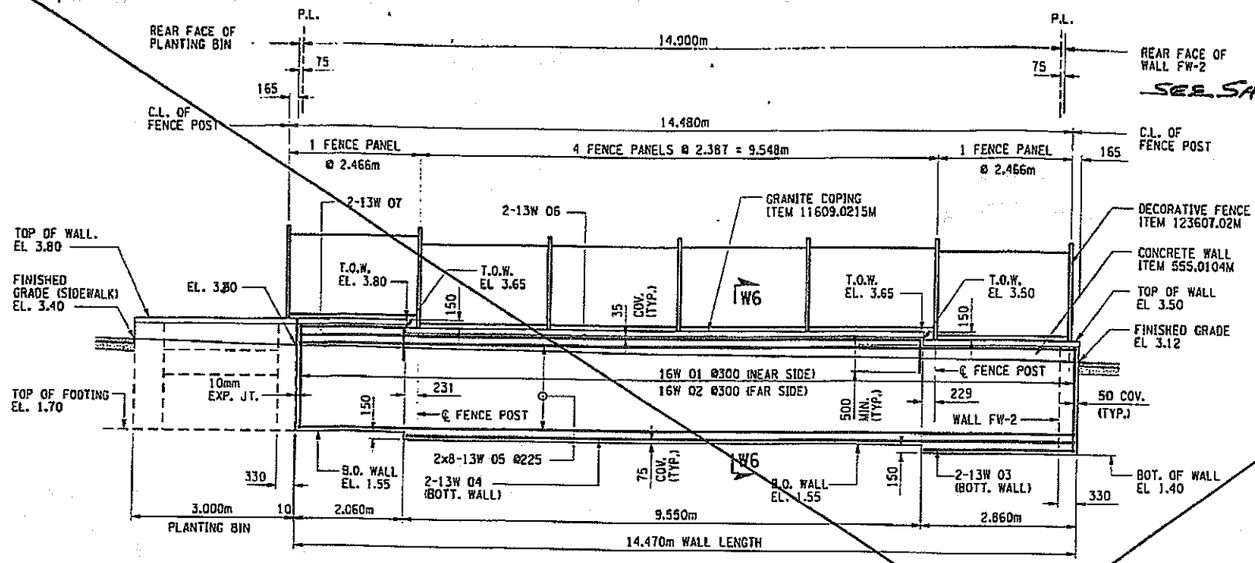
SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

DESIGNED BY: OF, AS CHECKED BY: JV, FS

DRAFTED BY: EL, RM, IV CHECKED BY: JV

ESTIMATED BY: FS

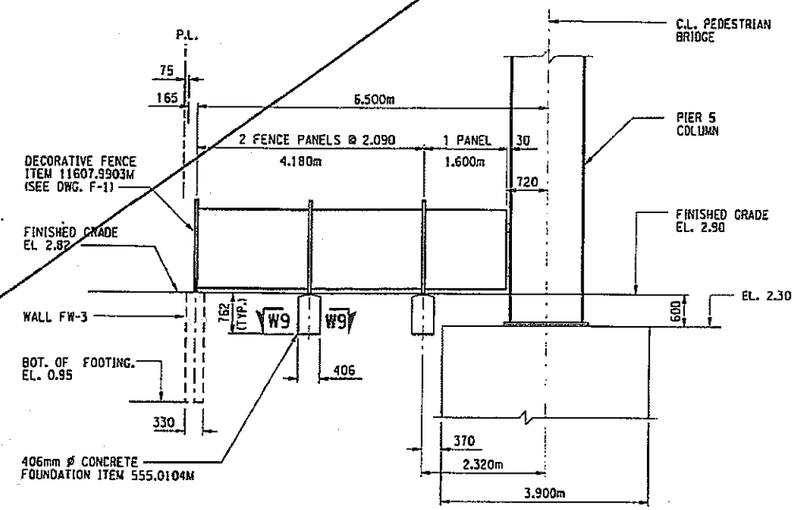
IN CHARGE OF: BT



ELEVATION W1-W1 (WALL FW-1)

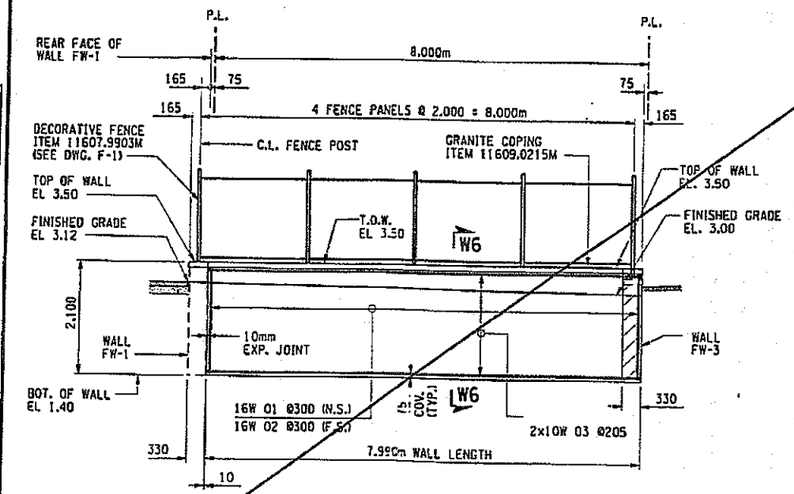
SCALE 1:50

N.I.C.



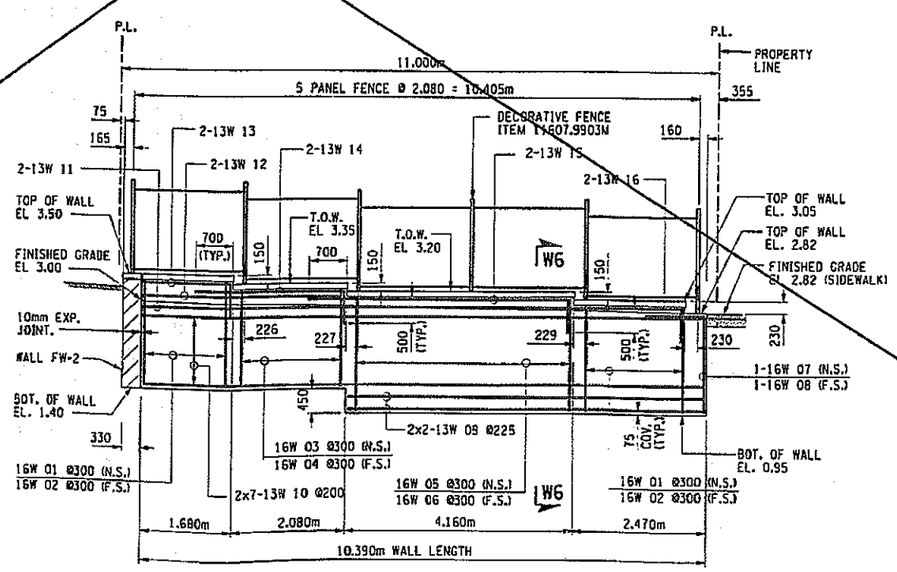
ELEVATION W4-W4

SCALE 1:50



ELEVATION W2-W2 (WALL FW-2)

SCALE 1:50



ELEVATION W3-W3 (WALL FW-3)

SCALE 1:50

NOTE:

1. WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER FOLLOWING ITEMS UNLESS OTHERWISE NOTED: ITEM 555.0105M, CONCRETE FOR STRUCTURES, CLASS 'A' ITEM 556.0201M, UNCOATED BAR REINFORCEMENT.
2. FOR ADDITIONAL NOTES AND DETAILS, SEE DWG'S. F-1 AND F-3
3. FOR WALL LOCATIONS SEE DWG TD-4
4. FOR SECTION W-9, SEE DWG F-3. FOR SECTION W-6, SEE DWG P-4

AS-BUILT REVISIONS

SIGNATURE DATE

DECORATIVE FENCE DETAILS 2
BUS LAYOVER AREA AT 46TH STREET

BARBARA THAYER, P.C.
[illegible]
NEW YORK, NEW YORK

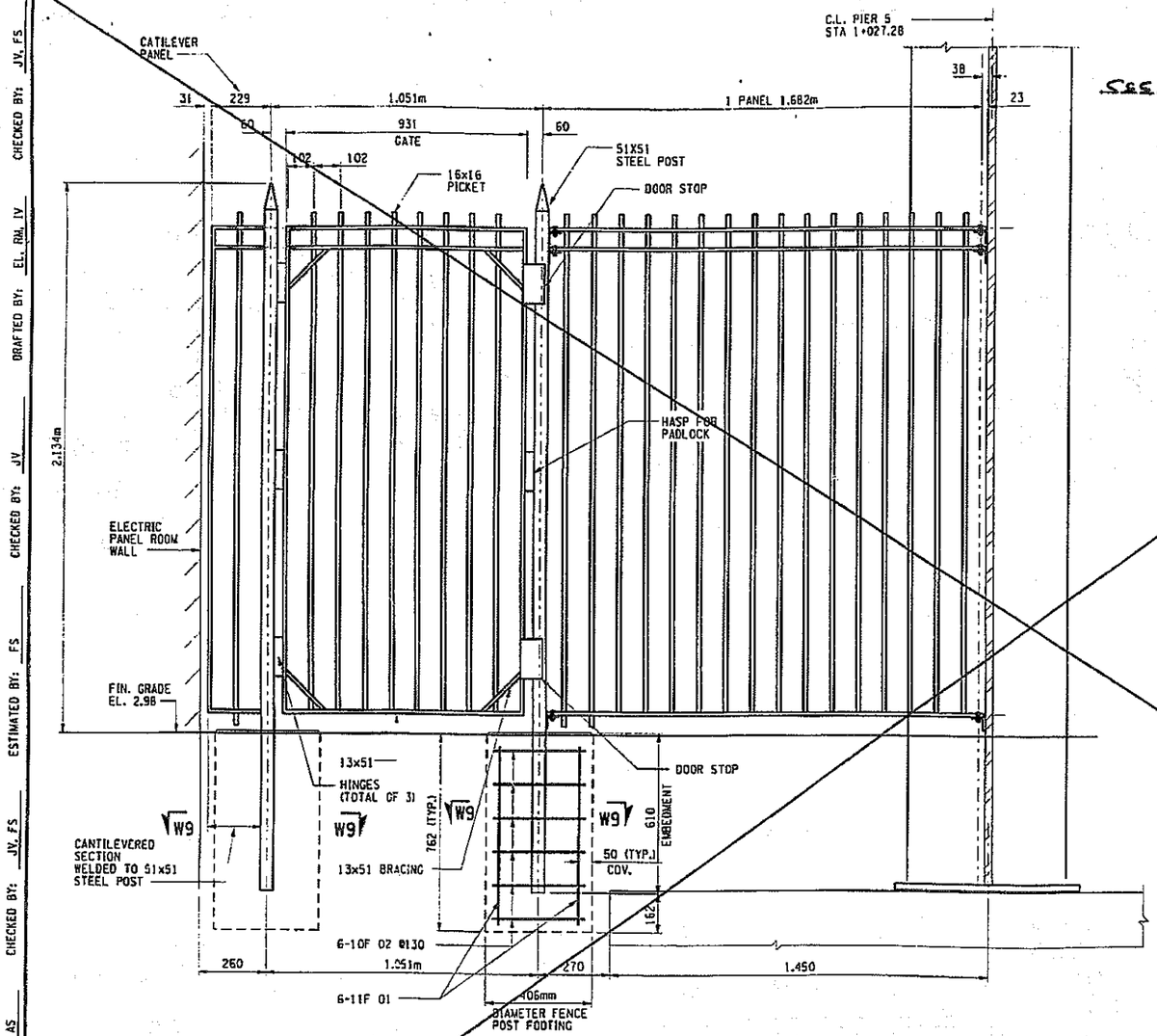
STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
F-2	DEC. 2000	AS SHOWN	EARTH TECH

D258583

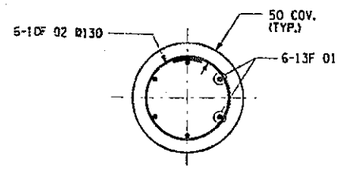
D258583

ESTIMATED BY: FS DESIGNED BY: JV, FS CHECKED BY: GF, AS DRAFTED BY: EL, RM, IV CHECKED BY: JV IN CHARGE OF: BT



SECTION W5-W5

SCALE 1:10



SECTION W9-W9

SCALE 1:10

FIELD CHANGE SHEET

THIS SHEET, 137F1, SUPERSEDES SHEET 137.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

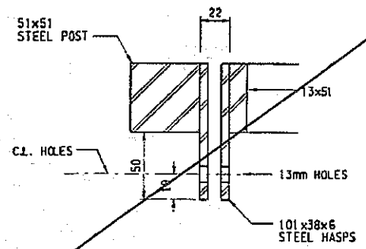
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		137F1	142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

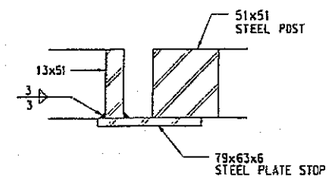
NEW YORK COUNTY PIN: X024.22



PLAN DETAIL HASPS FOR PAD LOCKS

SCALE 1:2

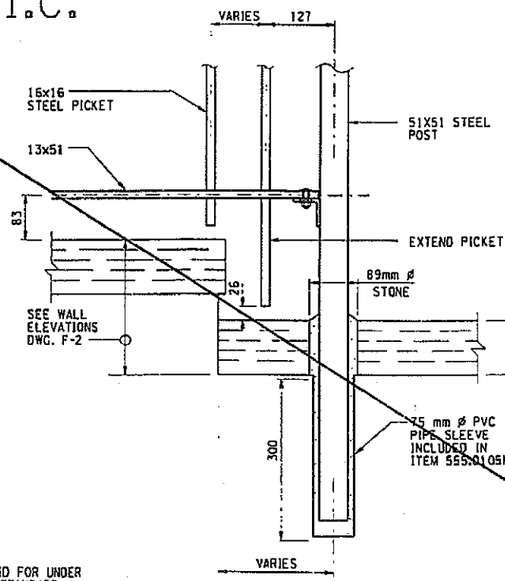
NOTE: HASP SHALL BE WELDED TOP AND BOTTOM TO 51x51 POST AND 13x51 RAIL



PLAN DETAIL DOOR STOP

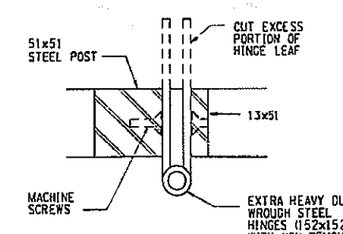
SCALE 1:2

N.I.C.



FENCE AT STEP IN WALL

SCALE 1:5



PLAN DETAIL HINGE

SCALE 1:2

NOTE:

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER ITEM 11607.9903M INCLUDING PAINTING FEDERAL STANDARD COLOR NO. 17778 UNLESS OTHERWISE NOTED.
2. FENCE POST FOOTINGS SHALL BE PAID FOR UNDER ITEM 555.0104M
3. FOR OTHER NOTES AND DETAILS, SEE DWG. F-1 AND F-2

AS-BUILT REVISIONS

SIGNATURE DATE

DECORATIVE FENCE DETAILS 3
BUS LAYOVER AREA AT 46TH STREET

BARBARA THAYER, P.C.
320 EAST 42ND STREET
NEW YORK, NEW YORK

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
F-3	DEC. 2000	AS SHOWN	EARTH TECH

D258583

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		138F1	R1142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 138F1, SUPERSEDES SHEET 138.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

DESIGNED BY: CF, AS — CHECKED BY: JV, FS — DRAFTED BY: EL, RM, JV — CHECKED BY: JV — ESTIMATED BY: FS

IN CHARGE OF: BI

LIMIT OF PAVING (AS PER PIN X024.27)

W. 46TH STREET

10.00m, 7.50m, 7.50m, 7.50m, 7.50m, 7.50m, 7.50m

QI, QM, QM, QM, QI, QI

LIMIT OF NEW SIDEWALK

EXIST. PLANTING (JC)

PEDESTRIAN BRIDGE

RH, RH — 5.00m, 5.00m

EXIST. PLANTING (RH)

SB ROUTE 9A

EXIST. TREES

PLANTED MEDIAN

NB ROUTE 9A

JBp, JBp, JBp, RA — 3.00m

SITTING WALL @ ISLAND

BOLLARDS (TYP.)

CONCRETE SIDEWALK

CONCRETE SIDEWALK

CONC. SIDEWALK

7.50m, 7.50m, 7.50m, 7.50m, 7.50m, 4.60m

0.80m, 7.50m, 5.00m, 4.00m, 7.50m

4.00m, 7.50m, 7.50m

W. 45TH STREET

DENOTES REVISIONS AUGUST 2002

NOTE:

1. FOR DRAINAGE PLAN REFER TO DWG. NO. BLA-3.
2. FOR LAYOUT PLAN OF BUS LAYOVER AREA REFER TO DWG. NO. BLA-1.
3. FOR PLANT LIST REFER TO DWG. NO. PL-1.
4. FOR DECORATIVE FENCE DETAILS SEE DWG. NO. F-1.
5. FOR ISLAND SEATING WALL, SEE DWG. NO. TD-14.

LEGEND:

- PARKING SIGN
- NEW LAMPPOST REFER TO DWG. BLA-4
- EXISTING LAMPPOST
- PL — PROPERTY LINE

AS-BUILT REVISIONS

1 CLOUDED AREA SHOWS REVISION OVER CONTRACT SHEET # 138

SIGNATURE — DATE

REVISIONS ONLY — EARTH TECH, A AECOM INTERNATIONAL LTD. COMPANY

PLANTING PLAN
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	EARTH TECH
P-1	DEC. 2000	1:200	

D258583

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		139F1	R1142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

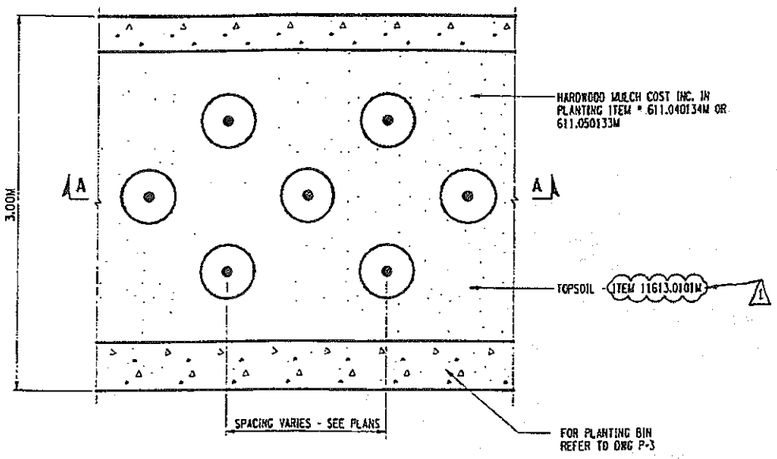
BIN: 1-07789-0

NEW YORK COUNTY — PIN: X024.22

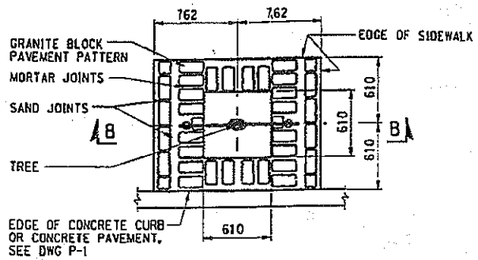
FIELD CHANGE SHEET

THIS SHEET, 139F1, SUPERSEDES SHEET 139.

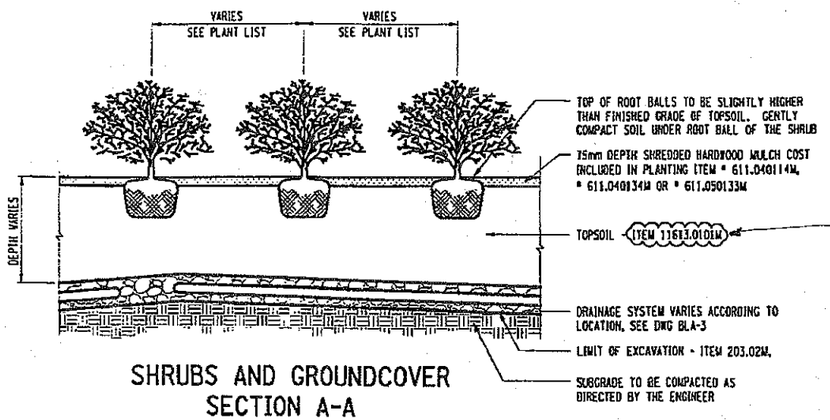
SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES



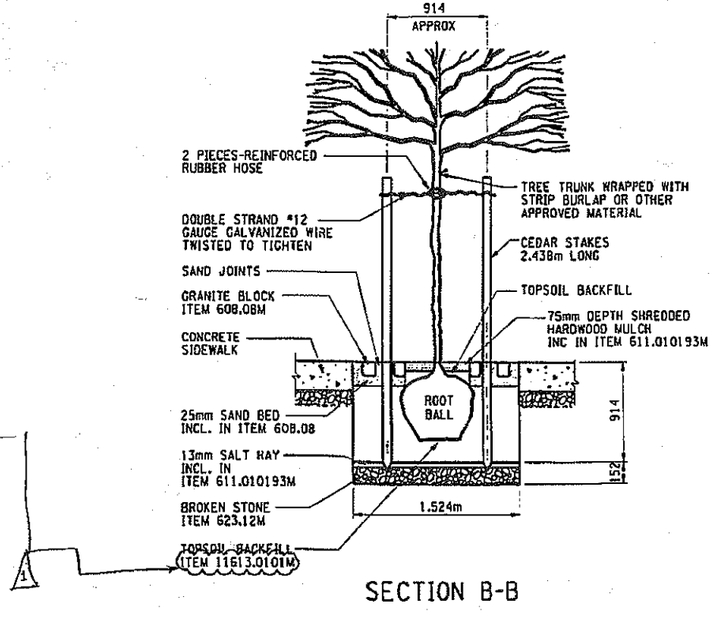
PLAN VIEW - SHRUBS & GROUND COVER IN SITTING WALL ISLAND 1



TREE PIT PLAN 1



SHRUBS AND GROUNDCOVER SECTION A-A



SECTION B-B

NOTE:

1. FOR PLANTING PLAN REFER TO DWG P-1
2. FOR PLANT LIST REFER TO DWG PL-1
3. FOR UNDERDRAIN SYSTEM REFER TO DWG BLA-3

AS-BUILT REVISIONS

1 CLOUDED AREA DENOTES REVISION OVER CONTRACT SHEET # 139

SIGNATURE DATE

DENOTES REVISIONS AUGUST 2002

REVISIONS ONLY
EARTH TECH
A CDM INTERNATIONAL LTD. COMPANY

BARBARA THAYER, P.C.
250 WEST 22ND STREET
NEW YORK, NEW YORK

PLANTING DETAILS BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
P-2	DEC. 2000	N.T.S.	EARTH TECH

DESIGNED BY: GF, AS — DRAFTED BY: EL, RM, JV — ESTIMATED BY: FS
CHECKED BY: JV, FS — CHECKED BY: JV, FS — CHECKED BY: JV — IN CHARGE OF: BT

D258583

D258583

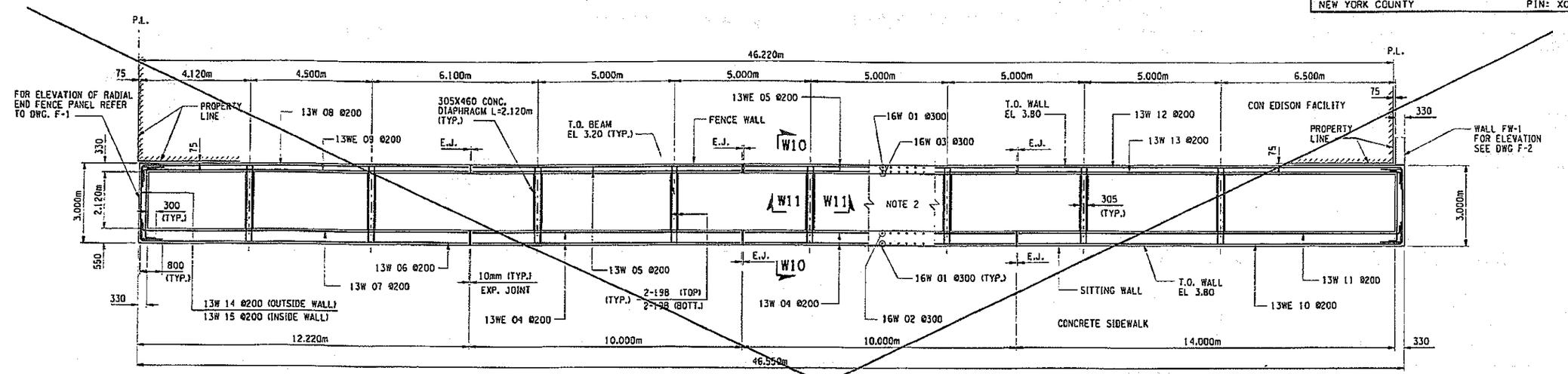
D258583

FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		140F1	142
ROUTE 9A RECONSTRUCTION PROJECT				
INTREPID PEDESTRIAN BRIDGE				
			BIN: 1-07789-0	
NEW YORK COUNTY			PIN: X024.22	

FIELD CHANGE SHEET

THIS SHEET, 140F1, SUPERSEDES SHEET 140.

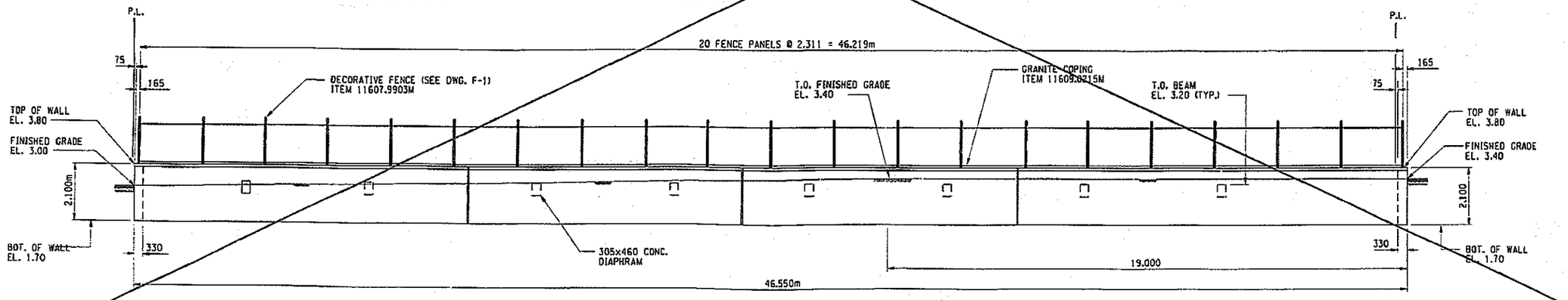
SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES



N.I.C.

PLAN AND WALLS REINFORCEMENT

SCALE 1:75



ELEVATION

SCALE 1:75

NOTES:

1. WORK SHOWN ON THIS DRAWING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS UNLESS OTHERWISE NOTED:
   WALLS - ITEM 555.0105M, CLASS A CONCRETE FOR STRUCTURES
   REBAR - ITEM 556.0201M, UNCOATED BAR REINFORCEMENT FOR STRUCTURES
2. VERTICAL BARS SHOWN PERTAIN TO ENTIRE WALL LENGTHS
3. FOR SECTIONS W-10 AND W-11, SEE DWG P-4.

AS-BUILT REVISIONS

SIGNATURE DATE

PLANTING BIN PLAN AND ELEVATIONS EAST TOUCHDOWN

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
P-3	DEC. 2000	AS SHOWN	EARTH TECH

BARBARA THAYER, P.C.
320 WEST 46TH STREET
NEW YORK, NEW YORK

DESIGNED BY: GF, AS
ESTIMATED BY: JV, FS
CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV
CHECKED BY: JV
CHECKED BY: FS
IN CHARGE OF: BT

D258583

D258583

D258583

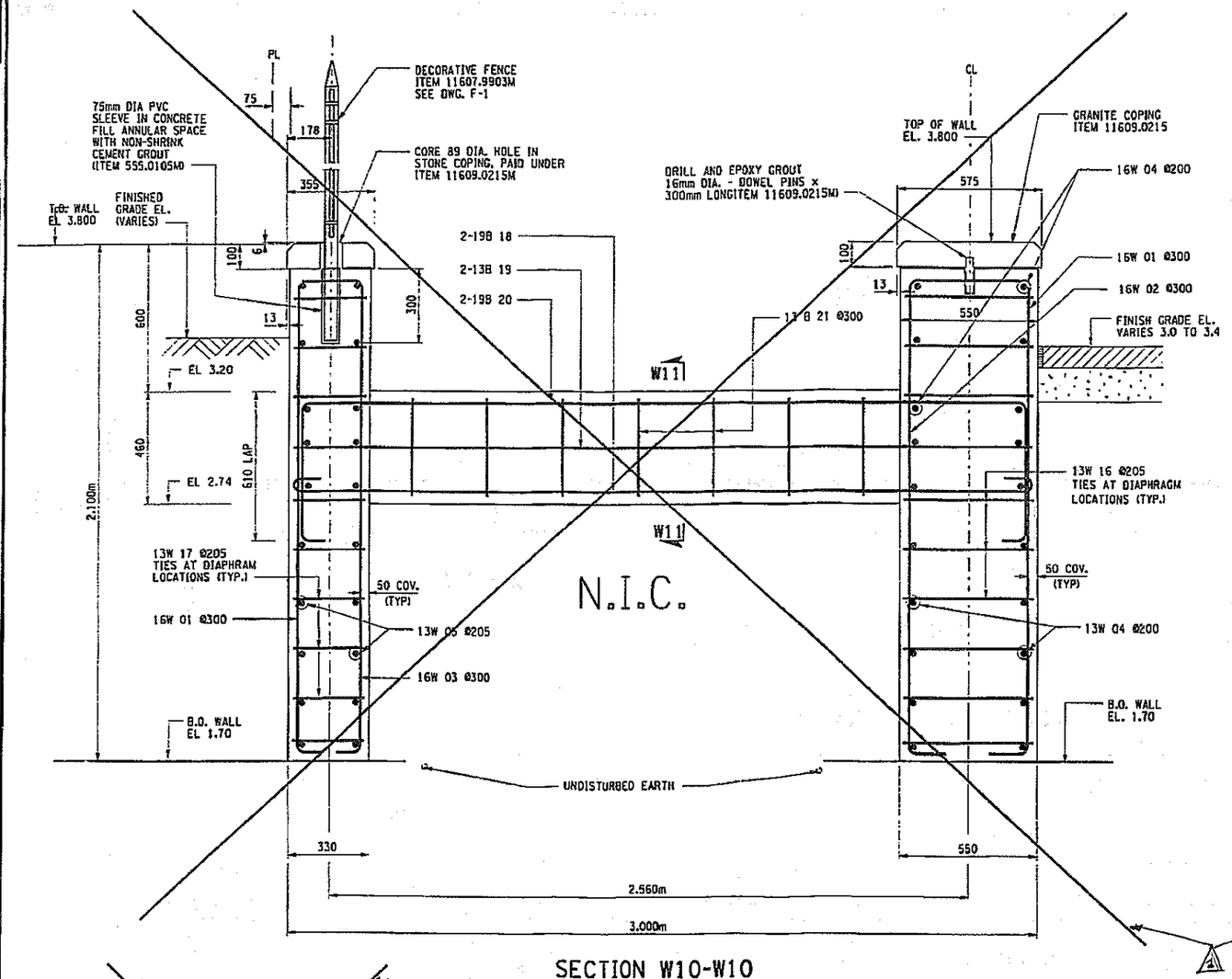
FED. RD REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		141F1 (R)	142

ROUTE 9A RECONSTRUCTION PROJECT

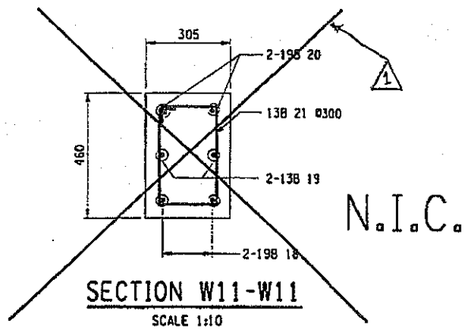
INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024-22

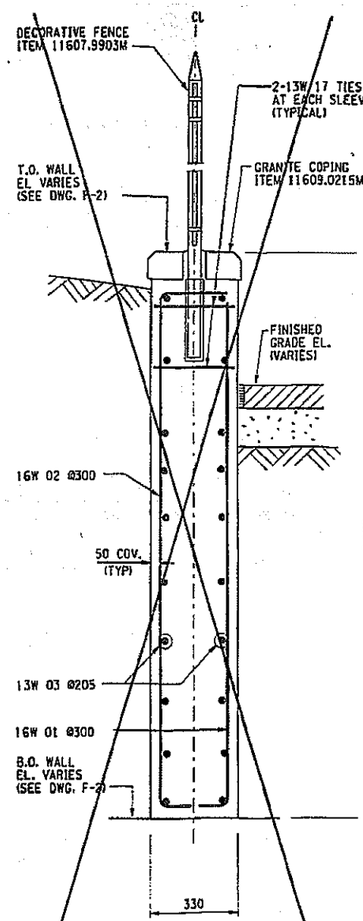


SECTION W10-W10
PLANTING BIN WALLS
SCALE 1:10



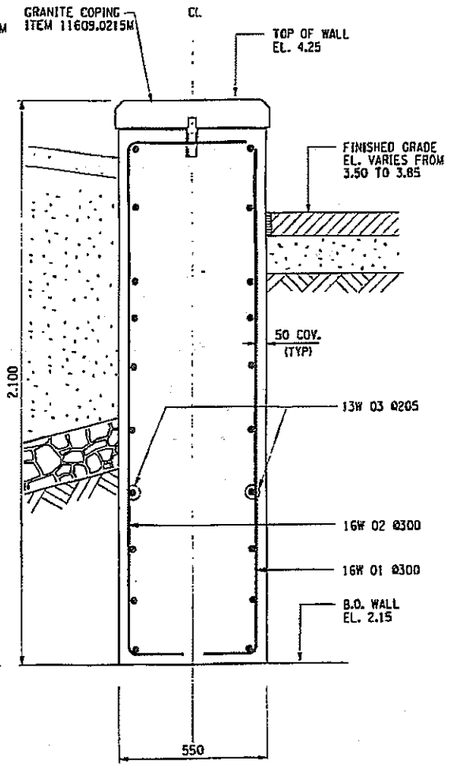
N.I.C.

SECTION W11-W11
SCALE 1:10



SECTION W6-W6 (TYP.)
FENCE WALL
SCALE 1:10

N.I.C.



SECTION W7-W7 (TYP.)
SITTING WALL
(AT PLANTING ISLAND)
SCALE 1:10

NOTES:

1. WORK SHOWN ON THIS SHEET SHALL BE PAID UNDER THE FOLLOWING ITEMS U.O.N.
   ITEM 555.0105M, CONCRETE CLASS A
   ITEM 556.0201, UN-COATED REBAR
2. SECTION W6 IS TAKEN ON DWG F-2. SECTION W-7 IS TAKEN ON DWG TD-14

FIELD CHANGE SHEET

THIS SHEET, 141F1, SUPERSEDES SHEET 141.

SEE SHEET No. 4FF FOR APPROVAL SIGNATURES

AS-BUILT REVISIONS

1 PLANTING BIN SECTIONS W6-W6, W10-W10 & W11-W11 ARE ELIMINATED FROM DRAWING.

SIGNATURE DATE

PLANTING BIN WALL, FENCE WALL AND SITTING WALL DETAILS

BARBARA THAYER, P.C.

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
P-4	DEC. 2000	AS SHOWN	EARTH TECH

DESIGNED BY: GF, AS
CHECKED BY: JV, FS
DRAFTED BY: EL, RM, JV
CHECKED BY: JV
ESTIMATED BY: FS
CHECKED BY: JV, FS
IN CHARGE OF: BT

D258583

D258583

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	N.Y.		142F1	9 142

ROUTE 9A RECONSTRUCTION PROJECT

INTREPID PEDESTRIAN BRIDGE

BIN: 1-07789-0

NEW YORK COUNTY PIN: X024.22

FIELD CHANGE SHEET

THIS SHEET, 142F1, SUPERSEDES SHEET 142.

SEE SHEET No. 4F1 FOR APPROVAL SIGNATURES

ITEM NUMBER	QTY.	LATIN NAME	KEY	COMMON NAME	SIZE	MINIMUM ROOT BALL SPREAD	ROOTS/ CONT.	SOURCE	SPACING	REMARKS
611 0101093M	9	QUERCUS IMBRICARIA	QI	SHINGLE OAK	100 MM CAL.	1060 MM	B & B	NG	SEE PLANS	LIMBED UP 2.25 M. SPRING PLANTING ONLY
611 0101093M	9	QUERCUS MACROCARPA	QM	BUR OAK	100 MM CAL.	1060 MM	B & B	NG	SEE PLANS	LIMBED UP TO 2.25 M. SPRING PLANTING ONLY
611 040134M	686	RHUS AROMATICA 'GRO LOW'	RA	GRO LOW FRAGRANT SUMAC	150 MM HT.	-	60 MM POT	PG	230 MM STAG.	
611 050133M	209	JUNIPERUS CONFERTA 'BLUE PACIFIC'	JBP	BLUE PACIFIC SHORE JUNIPER	460 MM SPRD.	-	#3 CAN	PG	600 MM STAG.	MATCHED SPECIMENS
611 040114M	250	ROSA RUGOSA 'FRAU DAGMAR HASTRUP'	RH	FRAU DAGMAR HASTRUP RUGOSA ROSE	300 MM HT.	-	#2 CAN	PG	600 MM STAG	
611 040114M	55	ROSA MEIDILAND 'PEARL'	RP	PEARL MEIDILAND ROSE	300 MM HT.		#2 CAN	PG	600 MM STAG.	N.I.C.
611 040114M	135	VIBURNUM OPULUS 'COMPACTUM'	VO	COMPACT ~~FUNDLEAF CRANBERRYBUSH~~	300 MM HT.	-	100 MM POT	PG	230 MM STAG.	
611 040134M	337	LONICERA X HECKROTTI	LH	EVERBLOOMING HONEYSUCKLE	150 MM SPRD.		#1 CAN	PG	230 MM ON FACE	

1

DENOTES REVISIONS AUGUST 2002

AS-BUILT REVISIONS

1 CLOUDED AREA DENOTES REVISION OVER CONTRACT SHEET # 142

SIGNATURE DATE

REVISIONS ONLY
EARTH TECH
A Tetra Tech International Ltd. Company

BARBARA THAYER, P.C.
320 WEST 42ND STREET
NEW YORK, NEW YORK

PLANT LIST
BUS LAYOVER AREA AT 46TH STREET

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

DWG. NO.	DATE	SCALE	
PL-1	DEC. 2000	NONE	EARTH TECH

IN CHARGE OF: BT DESIGNED BY: CF, AS CHECKED BY: JV, FS ESTIMATED BY: FS
DRAFTED BY: EL, RM, IV CHECKED BY: JV

0258583

APPENDIX G
CONSTRUCTION QUALITY ASSURANCE PLAN

CONSTRUCTION QUALITY ASSURANCE PLAN
FORMER WEST 45th STREET GAS WORKS SITE REV C
MANHATTAN, NEW YORK
(Site No. 231109)

Prepared For:

Consolidated Edison Company of New York, Inc.

31-01 20th Avenue
Astoria, NY 11105

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, New York 13212

April 2026

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LIST OF ATTACHMENTS

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LIST OF ACRONYMS

ACRONYM	DEFINITION
Con Edison	Consolidated Edison Company of New York
CQA	Construction Quality Assurance
CQC	Construction Quality Control
CQAP	Construction Quality Assurance Plan
CQCP	Construction Quality Control Plan
HASP	Health and Safety Plan
NYSDEC	New York State Department of Environmental Conservation
QA	Quality Assurance
QC	Quality Control
RA	Remedial Action
RDR	Remedial Design Report
RFI	Request for Information
UCS	unconfined compressive strength

1.0 INTRODUCTION

This Construction Quality Assurance Plan (CQAP) has been prepared for Consolidated Edison Company of New York, Inc. (Con Edison) and details the construction quality assurance (CQA) activities to be implemented during remedial construction activities at the Former West 45th Street Gas Works Site, Operable Unit 2 (the "Site"). The CQA/CQC program will be implemented to document that the New York State Department of Conservation (NYSDEC) selected remedy is constructed consistent with the requirements of the Remedial Design Report (RDR). The NYSDEC selected Site remedy is being implemented to comply with the requirements of the July 2021 Decision Document.

The Con Edison selected Contractor will prepare and submit, under separate cover, a Construction Quality Control Plan (CQCP) to Con Edison following Contractor selection and Notice to Proceed. This CQAP may be modified during finalization of the CQCP and other construction documents, as necessary.

1.1 Site Location and Description

The Site is located on the west side of mid-town Manhattan in an urban area. The site occupies the western half of the blocks between 11th and 12th Avenue, between West 45th and West 46th Streets.

The Site was operated as a manufactured gas plant (MGP) by the Consolidated Gas Company from 1877 to 1913. By-products of the gas production (i.e., coal tar) are the main sources of impacts that were found to be associated with the historic MGP structures in the subsurface.

An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate, or mitigate a release, threat of release or exposure pathway resulting from the site contamination. The footprint of the historic MGP was split into two Operable Units (OU); Operable Unit 02 (OU-2) is the subject of this document. Operable Unit 01 (OU-1) includes the original MGP site except for the northeastern portion of the site (OU-2), and adjacent off-site areas where MGP contamination has spread. OU-2 consists of the northeastern portion of the original MGP plant, which once held two gas holders and a purifying house.

1.2 Purpose

This CQAP presents the procedures and protocols to provide confidence the construction of the NYSDEC selected remedy selected for the Site will be executed in accordance with the approved Final Remedial Design Report, (hereafter referred to as the Remedial Design [Construction Drawings and Technical Specifications included as Appendices A and B, respectively]).

The objectives of this CQAP are to:

- Describe the quality program to be implemented during the implementation of the Site remedy to verify that the project is constructed in accordance with the requirements of the Remedial Design, Con Edison, and applicable regulatory standards.
- Define the CQA and CQC teams, associated roles and responsibilities, and communication process.
- Describe guidelines and procedures for routine work observation and testing of construction/operational activities; and
- Describe the documentation and record keeping protocol to be followed for pre-, during, and post-construction activities, including specifying requirements for documenting any deficiencies or field changes.

1.3 Definitions Relating to CQA and CQC

Generally, CQA and CQC are defined as follows:

- CQA: The planned and systematic means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.
- CQC: The planned system of inspections and testing taken by the Contractor to monitor and control the characteristics of an item or service to meet contractual and regulatory requirements.

In the context of this CQAP:

- CQA: The CQA processes in this plan will be used to verify that the quality of construction meets the requirements specified in the Remedial Design, specifically the drawings, specifications, and reports. The CQA processes are defined as a system of review procedures (including observations, testing, and documentation) that are also intended to confirm the Contractor's CQC processes are performed adequately and appropriately during construction.
- CQC: The CQC processes are a system of routine technical activities implemented by the Contractor to measure and control the quality of the construction as it is built (USEPA 1993). As described in the Technical Specifications, the Contractor is required to develop a Construction Plan as specified in the project's technical specifications. This Plan will provide procedures for documenting (through various submittals and CQC forms) and implementing a CQC system of inspections, tests, and production controls to demonstrate compliance with the design, and thereby ensure that the Engineer's CQA activities will confirm that the requirements specified in the Remedial Design have been achieved.

1.4 Remedial Design Components

The Site Remedy has been designed to provide long-term protection to human health of the surrounding community members and the public, and to satisfy the requirements of the Decision Document. This CQA/CQC Plan describes CQA/CQC activities that will be performed for the implementation of the Site remedy. In general, this CQAP provides CQA guidance for the four major phases of the Remedial Design, which include:

- Excavation and Debris Removal
  - Demolition of existing infrastructure
  - Excavation to design depths
  - Removal of subsurface obstructions
- Material Management, Handling, and Disposal
- In-situ Stabilization/Solidification (ISS) Treatment
- Site Cover System Installation

1.5 Report Organization

The remainder of this document consists of the following sections:

Section 2 – Project Organization: presents the overseeing regulatory agencies, the key project roles involved in implementation of the remedy, their responsibilities, and the reporting structure and communication.

Section 3 – Project Meetings, Reports and Field Documentation, and Forms: describes the project meetings, reports, field documentation, and forms that will be performed as part of the remedial construction.

Section 4 – Technical Submittals Review: presents the procedures for processing and reviewing Contractor submittals.

Section 5 – Construction Oversight: details the construction oversight tasks related to excavation and debris removal, material handling, management, and disposal, ISS treatment, and site cover system installation to provide confidence in the construction quality of the Remedial Design.

Section 6 – References: contains cited references.

2.0 PROJECT ORGANIZATION

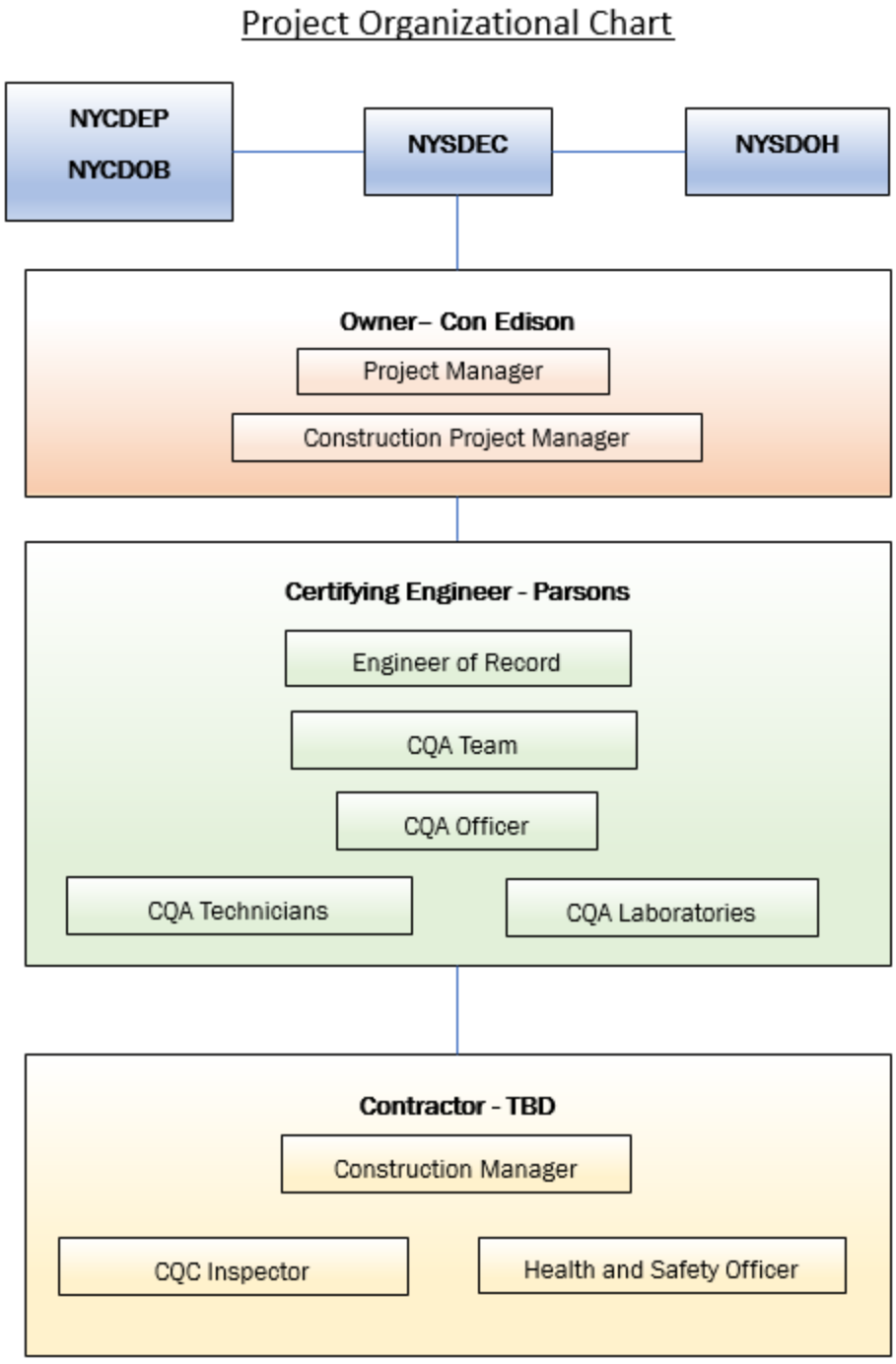
Several organizations will be directly involved in the performance, review, and overall quality of this project. These organizations have specific project functions and relate to each other in various ways according to their project responsibilities. The key project team members are described below and presented on the Project Organization Chart (**Figure 2.1**). A project contacts list is provided on **Table 2.1** below.

2.1 Roles and Responsibilities of the Construction Team

Implementation of the remedial design is a concerted effort between the NYSDEC and Con Edison. Each entity plays a key role and has responsibilities necessary to execute the project in accordance with the RDR, supporting plans, Construction Drawings, and Technical Specifications. An established chain of command is essential for communication and decisive decision making. General descriptions of the roles and responsibilities of the team members and agencies are described and shown below in **Figure 2.1**. Additional details will be developed once the Contractor and construction management team are selected.

The roles and responsibilities of the selected parties involved with the RA construction are described below.

Fig 2.1: Project Organization Chart



2.1.1 Regulatory Agencies

2.1.1.1 New York State Department of Environmental Conservation

Regulatory oversight of the remedy at this Site is being conducted by the NYSDEC.

2.1.1.2 New York State Department of Health

Regulatory oversight of project implementation with respect to human health, including community air monitoring requirements is being conducted by the New York State Department of Health (NYSDOH).

2.1.1.3 New York City Department of Buildings

Regulatory oversight of project implementation with respect to human health and local city codes and ordinances is being conducted by the NYCDOB.

2.1.1.4 New York City Department of Environmental Protection

Regulatory oversight of project implementation with respect to human health pertaining to noise and fugitive dust mitigation related to construction activities at this Site is being conducted by the NYCDEP.

2.1.2 Owner

Con Edison (Owner) is responsible for implementing the Site remedy in accordance with the approved final RDR and supporting plans, Construction Drawings, Technical Specifications, and implementing agreements with NYSDEC and other stakeholders. The Owner will be responsible for confirming that the requirements of this CQAP are implemented by the Con Edison's selected engineer (Certifying Engineer).

2.1.2.1 Construction Project Manager

The Construction Project Manager (CPM) will serve as the Owner's on-site representative. The CPM will interface directly with the NYSDEC, Contractor, and the Certifying Engineer as necessary. The CPM has the following specific duties:

- Provide centralized leadership for project activities;
- Provide overall coordination of the on-site remedial activities.
- Interpret and plan the overall work effort;
- Communicate directly with the Contractor (CM), and Certifying Engineer for project needs;
- Ensure that CQA/CQC activities are conducted;
- Define personnel and equipment requirements and secure resource commitments;
- Coordinate and participate in meetings as required;
- Monitor the overall financial and schedule status of the project;
- Review and negotiate change orders;
- Review and approve pay applications; and
- Maintain overall project safety standards.

2.1.3 Certifying Engineer

The Certifying Engineer will be accountable to the Owner and CPM to verify the construction of the remedy is performed in accordance with the approved final RDR, including Construction Drawings and Technical Specifications and Contractor's Construction Work Plans. The Certifying Engineer will have the authority, on the behalf and with collaboration of the Owner, to direct the Contractor with respect to actions relevant to meeting CQA activities and the requirements of the Remedial Design.

The Certifying Engineer will be the Owner's primary point of contact for coordination on CQA measures. The Certifying Engineer is responsible for technical guidance and management of QA and tracking of QC processes and procedures. The Certifying Engineer will be responsible for the following QA activities related to remedial construction:

- Managing, tracking, and reviewing Contractor submittals
- Overseeing preparation of meeting agenda and minutes
- Evaluating the project schedule
- Reviewing Routine Work Element QA Report Forms (**Attachment A**)
- Notifying the Owner and Contractor and submitting Non-Conformance Report Forms (**Attachment B**)
- Ensuring issues of deficiency and/or non-conformance are corrected,
- Coordinating review and approvals for RFI Forms
- Preparing and submitting Field Change Forms (see Appendix C).

In addition to the above, the Certifying Engineer is responsible for implementing this CQAP and will provide CQA oversight, monitoring construction CQC activities, to verifying and document compliance with the Contract Documents. The Certifying Engineer will also be responsible for preparing a Construction Completion Report (CCR) once the RA construction activities are completed. The CCR will be prepared and submitted the NYSDEC in accordance NYSDEC DER-10.

The Certifying Engineer will be supported by a CQA Team, consisting of a CQA Officer, CQA Technicians, and laboratory services whose focus is to implement the CQA activities identified in this CQAP. Roles and responsibilities associated with the CQA Team are described in the following subsections.

2.1.3.1 Construction Quality Assurance Officer

The CQA Officer will be on-site during construction and be responsible for completing CQA activities including the following:

- Conducting and/or overseeing routine and documenting the work,
- Monitoring the compliance of materials,
- Confirming that workmanship is in accordance with the requirements of the Construction Drawings and Technical Specifications,
- Completing on-site and off-site QA testing and documentation of materials as required,
- Reporting non-conformance with the Construction Drawings and Technical Specifications,
- Verifying implementation of corrective actions and documenting corrective action closeouts,
- Directing work stoppage or reperformance of any identified construction deficiency or non-conformance action,
- Assisting the Certifying Engineer in preparing Field Change Forms; and
- Assisting the Certifying Engineer in preparing the final CCR.

The CQA Officer will review the CQC procedures and documentation as provided by the Contractor's CM. In addition to the QA testing described in the design documents, additional QA testing may be required by the Certifying Engineer and/or Agencies. Daily reporting by the CQA Officer will include a daily summary report, field logs, photographic documentation and if necessary, reports of problem identification and corrective measures taken.

2.1.3.2 Construction Quality Assurance Technicians

The CQA Technicians will report directly to the CQA Officer. The CQA Technicians will perform the task-specific QA requirements for construction of the Remedy. The CQA Technicians will monitor the day-to-day activities of the Contractor for compliance with Construction Drawings and Technical Specifications. The CQA Technicians are responsible for:

- Monitoring and sample collection,
- Performing field observations and documenting construction activities in Routine Work Element QA Report Forms,
- Observing and documenting implementation of corrective actions identified in Non-Conformance Reports.

2.1.3.3 CQA Laboratories

The CQA Laboratories will provide analytical results of samples collected and submitted by the CQA Technicians. CQA laboratory disciplines include:

- Geotechnical CQA Laboratory: Tests include, for example, material qualifications (conformance) tests and material CQA (performance) tests as described in the Technical Specifications. The Certifying Engineer will verify that the CQA laboratory test results comply with the requirements of the Technical Specifications and previously approved submittals. The geotechnical CQA laboratory will not be the same Independent Testing Lab used by the Contractor for CQC testing, as defined in the Technical Specifications.
- Analytical CQA Laboratory: Tests include, for example, chemical analysis of backfill material for on-site placement. The Certifying Engineer will verify that test results (i.e., chemical data) comply with the requirements of the Technical Specifications and previously approved submittals. The Analytical CQA laboratory will not be the same Independent Testing Lab used by the Contractor for CQC testing, as defined in the Technical Specifications.

The laboratory will be responsible for completion of the analytical procedures in accordance with set requirements of the analytical method and reporting limits, as well as generation and distribution of completed laboratory data packages for all field and CQA/CQC samples collected during performance of construction activities. Laboratory sample requirements are provided in the Quality Assurance Project Plan (QAPP). The name(s) of the selected laboratory(ies) will be provided to NYSDEC once services have been procured.

2.1.4 Contractor

The Contractor will be selected by the Owner to provide the labor, materials, equipment, and subcontractors required to construct the project in accordance with the requirements set forth in the Remedial Design documents and this CQAP. The Contractor will be responsible for the CQC of the constructed work product as well as the necessary inspections and tests required to confirm that the work complies with the Contract. The Contractor will exercise authority over the Contractor's workforce, including any subcontractors, CQC personnel and any subcontracted CQC support services. The Contractor and their subcontractors will adhere to this CQAP and the Contract Documents.

In addition to the requirements detailed above, the Contractor will have the following responsibilities for implementing the procedures presented in this CQAP:

- Submit a CQC organization chart, subject to review and approval by the Owner, developed to present CQC personnel and how these personnel will integrate with other management, production, and construction functions and personnel,
- Review and understand the requirements set forth in the Remedial Design documents and this CQAP,
- Maintain lines of communication with the CPM and Certifying Engineer, as necessary,

- Coordinate with material and equipment suppliers to document compliance with the CQAP requirements,
- Provide the Certifying Engineer with written notice of any construction material sample results, tests, or inspections required by the CQAP or other Remedial Design documents,
- Prepare and submit to the Certifying Engineer all CQC testing results, shop drawings, and other required submittals specified in the Technical Specifications or CQAP,
- Prepare and submit all Contractor required submittals identified in the Technical Specifications,
- Identify any potential issues as early as possible to allow resolution in a manner that will not impact the quality or schedule of construction activities,
- Maintain a continuous record of approved changes or modifications to the approach presented in the Contract Documents.

The Contractor's will be supported by the following members listed below.

2.1.4.1 Construction Manager (CM)

- Coordinates with Certifying Engineer and CQA Team;
- Oversees the day-to-day operations at the Site.
- Directs the work crew on daily operations.
- Makes field decisions for the Contractor, attends meetings, and controls subcontractors' work activities.
- Communicates directly with the CPM.
- Prepares the Daily Field Reports and the Monthly Progress Reports.

2.1.4.2 Construction Quality Control Inspector (CQC Inspector)

- Oversees the on-site execution of the CQC components of this CQAP.
- Provides required documentation to ensure that the Contractor's construction activities comply with the RDR and Contract Documents.
- Provides required notification to CPM and CQA Team prior to collection of samples.
- Coordinates the collection and testing of required CQC samples.
- Transmits results to the CPM and CQA Team.

2.1.4.3 Health and Safety Officer

- Oversees the implementation of the Contractor's Health and Safety Plan (CHASP) for Contractor personnel.
- Provides the required documentation to the CPM to ensure that the Contractor's construction activities comply with the CHASP, as well as the applicable permits.

2.2 Chain of Command and Communication

The chain of command onsite starts with the CPM. Issues or concerns from the NYSDEC will be channeled through the CPM. During construction, the CPM will be in direct communication with the NYSDEC and the Owner. To minimize confusion and miscommunications, the NYSDEC, NYSDOH and/or other agencies will not communicate directly with the Contractor or its subcontractors. Refer to **Figure 2.1** – Project Organization Chart in Section 2.1.

Detailed contact information for personnel identified on the project organization chart will be developed after contractor selection.

3.0 PROJECT MEETINGS, REPORTS, AND FORMS

CQA activities will be performed at various stages of the construction to document construction is being conducted in accordance with the approved Remedial Design. Documentation of the CQA activities will support a determination of whether construction activities have been carried out in general conformance with the approved Contract Documents.

3.1 Project Meetings

This section includes a discussion of the various project meetings that will be held throughout the performance of the work. The purpose of the meetings is to provide construction kickoff, discuss work progress, plan work activities, address issues related to construction, and project closeout. Meetings with key project personnel are necessary to assure a high degree of quality during construction, and promote clear, open channels of communication.

3.1.1 Pre-Construction Meeting

Following approval of the RDR and prior to commencement of construction activities, the CPM will conduct a construction kickoff meeting scheduled for the Project Team. The Project Team meeting attendees will include representatives from NYSDEC, NYSDOH, the Owner and CPM, the Certifying Engineer, and the Contractor. At a minimum, the meeting agenda will include Site safety, roles and responsibilities, the planned construction activities, including means and methods, and a Site walk.

3.1.2 Progress Meetings

The CPM will conduct progress meetings on a weekly basis to discuss the previous week's completed work and the next week's anticipated work. The NYSDEC, the CPM, the Certifying Engineer, and the Contractor will participate, at a minimum. A portion of these meetings may be dedicated to CQA/CQC issues, as necessary, to provide an opportunity for the CQA team to express concerns regarding quality, to relay test results, and to provide regular communication between organizations involved in the construction. Any non-CQA/CQC issues related to the construction may also be raised and addressed during the meeting. The Contractor will document the meeting and send meeting minutes to all attendees for review and comment. Minutes of weekly progress meetings will be distributed to the project team.

3.1.3 Pre-Final Closeout Review Meeting

Following notification of substantial completion by the Contractor, the CPM, the Certifying Engineer, and NYSDEC Project Manager will conduct a pre-final closeout review of the Site and hold a meeting to discuss pre-final review details. As discussed in Section 3.3.2, a final written action items/work punch list will be prepared by the CPM and the NYSDEC Project Manager for submittal to the Contractor. The final written action items/work punch list will be discussed in the construction closeout meeting.

3.1.4 Construction Closeout Meeting

Following substantial completion of the Site remedy, the project team will meet to discuss the final punch list, Site operation, maintenance, and monitoring, and project completion issues. The CCR expectations will also be discussed.

3.2 Reports and Field Documentation

This section describes the daily, weekly, and monthly report requirements for the project. The CQA field documentation requirements are also provided.

3.2.1 Daily Field Reports

The CM will prepare a Daily Field Report that summarizes construction activities. Required information for the Daily Field Report is detailed in Specification Section 01322 – Construction Progress Reporting. The Daily Field Report will also include Site photos and sketches of work completed as necessary. The Daily Field Reports will be prepared and submitted to the CPM and Certifying Engineer.

3.2.2 Weekly Field Reports

The CQA Officer will prepare a Weekly Field Report which will document the various aspects of the work. This will include, but not be limited to construction activities, safety issues, CQC/CQA requirements, deviations, schedule, budget, and other topics related to the weekly construction activities.

The CQC Inspector will provide the CQA Officer a CQC reporting section for the Weekly Field Report summarizing the CQC activities. The Weekly Field Report will be submitted to the CPM.

3.2.3 Monthly Progress Reports

The CM will prepare a Monthly Progress Report and submit it to the CPM and Certifying Engineer, The Monthly Progress Report will summarize work activities and other issues pertinent to the construction completion. Monthly Progress Reports will contain, at a minimum, the following information:

- Date, project name, location,
- A summary of work performed during the progress reporting period,
- A summary of construction situations/deficiencies occurring during the progress reporting period; and
- A summary of test results, failures, and retests, if applicable.

3.2.4 CQA Field Documentation

3.2.4.1 Field Log Book

The CQA Team will maintain daily field logbooks for the project. Information will be recorded in field logbooks to document construction activities. Field documentation of construction activities will be comprehensively recorded with the following details at a minimum: dates, times, weather conditions, personnel onsite, equipment used, materials used, visitors, health and safety issues, work activities completed, and construction-related issues.

3.2.4.2 Photographic Documentation

The CQA Team will collect photographic documentation of the construction activities, materials installation methods, and testing procedures. Photographs will serve as a pictorial record of work progress, problems, and corrective measures. Photographic reporting data sheets will be used to organize and document photographs taken during construction. The photographic reporting data sheets will be cross-referenced and/or appended to Weekly Field Reports, CQA monitoring logs, test data sheets, and/or problem identification and corrective measures reports.

3.2.4.3 Weekly CQA Report

The CQA Team will prepare a Weekly CQA Report that will be appended to or included in the Weekly Field Report. The Weekly CQA Report will include Routine Work Element QA Monitoring Forms (Attachment A) completed during that week. CQA/CQC issues will be discussed and addressed at the Progress Meetings.

3.3 Forms

The CQA Team will conduct daily reviews of all construction activities to document that the work being completed is compliant with the Remedial Design. NYSDEC and other regulatory agencies may conduct independent review of the work being completed. Reviews by the CQA Team and regulatory agencies are intended to augment, not replace, the Contractor's required CQC inspections.

3.3.1 Routine Work Element QA Monitoring

The CQA Team will conduct routine monitoring of specific work elements and document observations in Routine Work Element QA Monitoring Forms (**Attachment A**), including:

- Access roads and temporary facilities (e.g., staging areas, construction water treatment system),
- Soil excavation activities including material handling and off-site transportation and disposal,
- ISS treatment activities,
- Decontamination activities,
- Site cover system installation

In addition to these specific work elements, the CQA Team will periodically monitor the overall Site condition. Overall site condition items include field trailers, soil erosion and sediment control measures, security fence/gate(s), and survey control points.

3.3.2 Pre-Final and Final Walkthroughs

Following notification of substantial completion by the Contractor, The Owner and CPM, Certifying Engineer, and NYSDEC will conduct a pre-final walkthrough of the Site. A final written work punch list will be prepared by the Owner, CPM, and the NYSDEC for submittal to the Contractor. The final punch list will identify project completion expectations to facilitate the Contractor to schedule work activities, including site clean-up and demobilization. Once punch list items have been addressed by the Contractor and approved by the Owner in writing, the NYSDEC will conduct a final walkthrough. Upon written NYSDEC approval, the remedy will be considered completed and the Contractor will demobilize from the Site.

3.3.3 Non-Conformance Report Form

A non-conformance is defined as material or workmanship that does not meet the specified requirement(s). Non-conformance identification and corrective measures reports will be cross-referenced to specific summary reports, forms, logs, or test data sheets where the non-conformance was identified. The Certifying Engineer will inform the Contractor in writing of significant recurring non-conformance with the Contract Documents. The cause of the non-conformance will be determined by the Certifying Engineer. The Contractor will be directed by the CPM to correct the non-conformance. When this type of evaluation is made, the results will be documented, and any revision to procedures or specifications must be approved by the Certifying Engineer. An example Non-Conformance Report Form is provided in **Attachment B**.

3.3.4 Field Change Request Form

Changes to the approved Remedial Design require approval by the Certifying Engineer and if deemed significant, by Owner and NYSDEC. Material substitutions (i.e., "replacement-in-kind") are not considered a field change and will be approved, if appropriate, by the Certifying Engineer as part of the technical submittal review process. An example Field Change Form is provided in **Attachment C**.

3.3.5 Construction Completion Report and Record Drawings

A CCR will be prepared and submitted to the NYSDEC to document the remedy completion. The Certifying Engineer will certify that the construction was performed in accordance with the approved Remedial Design and approved field changes. The CCR will include, but not be limited to the following:

- A description of the completed construction work activities
- Approved design changes to the Remedial Design
- Record Drawings

- A project photographic log
- Sampling/analysis summary table
- Material trip tickets and/or summary table
- Waste profiles and manifests

Record Drawings will be prepared based on the Design Drawings, Contractor markups on the Design Drawings conducted throughout the construction, and Contractor As-Built Drawings based on the construction survey information collected during construction. The Record Drawings will be signed/sealed by the Certifying Engineer.

4.0 TECHNICAL SUBMITTALS REVIEW

The CM will be responsible for the preparation and maintenance of the required Contractor submittals in accordance with Specification Section 01350 – Document Submittal Procedures. The submittal register will be used to track the status of submittals and will be maintained and updated by the CQA Officer weekly, at a minimum.

Submittals are divided into two categories:

- For Certifying Engineer's review
- For information only.

Submittals for the Certifying Engineer's review include the Contractor Work Plans that describe means and methods associated with work being performed and corresponding QC protocols that the Contractor will implement during construction. Following the Certifying Engineer's and CPM's (as applicable) review and acceptance, the CQA Technicians will monitor construction activities to verify that the Contractor's QC protocols provided in these submittals are implemented during construction.

Submittals will be identified as "for information only" for submittals that do not require the Certifying Engineer's review and are being provided for informational purposes only, such as summary of work performed (e.g., daily reports and weekly information) during construction activities. The Certifying Engineer will confirm that for information-only submittals meet the requirements of the Technical Specifications for these submittals.

5.0 CONSTRUCTION OVERSIGHT

Construction oversight and CQA/CQC testing is part of assessing whether construction is completed in accordance with the Remedial Design. Construction oversight and CQA testing will be performed by the Certifying Engineer or their representative (i.e., CQA Team). CQC testing will be performed by the Contractor. Requirements of CQC testing are detailed in the Technical Specifications. This CQA Plan describes CQA testing pertaining to excavation and debris removal, material handling, management, and disposal, ISS treatment, and site cover system installation.

5.1 Excavation and Debris Removal

5.1.1 General

Soil excavation is required as part of the Site remedy; the removal of surface soils in the areas identified for ISS treatment The CQA Team will provide construction oversight of the following excavation activities in terms of conformance with the Construction Drawings and Technical Specifications:

- Verification of excavated soils to the lateral limits and depth tolerances as shown in Design Drawings and Technical Specifications

5.1.2 Conformance Testing

A pre-excavation survey will be performed by the Contractor to document pre-excavation conditions. The pre-excavation survey will identify the lateral limits of excavation required as shown on the Design Drawings. The Contractor will perform post-excavation surveys as construction proceeds to measure the actual limits excavated. Both the pre- and post-excavation surveys will be verified and approved by the Certifying Engineer. The CQA Team will review and verify both pre- and post-excavation surveys to certifying design excavation limits are achieved.

5.1.3 Performance Testing

The post-excavation survey will be conducted on a 10-feet by 10-feet grid within the limits of excavation. Grid surveyed location elevations will be compared against design excavation depths. Grid survey elevations will be verified to be within +/- 2 inches of design excavation depths. If grid surveyed elevations are outside the tolerance limit, the Contractor will excavate or fill the out of tolerance area. The reworked area grid points will be resurveyed and verified for compliance with excavation design elevations.

In addition to the conformance and performance testing detailed above, the CQA Team will be responsible for collecting a subset of waste characterization samples for any materials to be disposed of off-site, see Section 5.2 for additional information.

5.1.4 Construction Monitoring

The CQA Team will observe Contractor's progress during soil excavations. The CQA Team will document Contractor methods and excavation progress, including review and verification of Contractor post-excavation surveys. The CQA Team will verify that excavated soils and construction water are managed properly, including temporary storage, sampling and characterization efforts, and disposal, see Section 5.2 for specific CQA responsibilities.

Excavated soils and construction water will be visually inspected for gross contamination, and/or the presence of NAPL or MGP-related impacts, including tar, visible staining, and odors,

Additionally, the Contractor's methods for storing, loading, and hauling excavated materials for disposal will be continuously observed to ensure methods are conducted in accordance with the Specifications Sections 01110 – Environmental Protection Procedures, 02120 – Off Site Transport and Disposal, 02125 – Decontamination, and 02315 – Excavation.

During soil excavations, any obstructions encountered that extend beyond the limits of excavation will be documented and the location and apparent limits of the obstruction surveyed to be included in the post-excavation survey. Attempts to remove any obstructions in the ISS zones will be conducted in safe and appropriate manner. If debris or obstructions encountered in the ISS zones are not able to be successfully removed using conventional construction equipment or techniques, the extents of the obstruction will be documented and recorded in post-excavation survey. Any remaining obstructions extending into ISS areas beyond the limits of excavation that are unable to be removed must be verified by the Certifying Engineer prior to initiating ISS treatment application in that area. The Certifying Engineer may coordinate with the Contractor to aid in the development of suitable application techniques to work around suspected obstructions. This will be managed on a case-by-case basis to ensure the subsequent ISS treatment can be implemented successfully.

The CQA Team will also verify excavation activities are conducted safely and that appropriate safety measures are employed during excavation. This includes ensuring the Contractor is following safety measures prescribed by the Contractor's Work Plans and the CHASP.

5.1.5 Deficiencies

If a deficiency is identified during construction, the CQA Officer will immediately determine the extent and nature of the deficiency by additional surveys, visual observations, review of records, or other appropriate means. The CQA Officer will notify the CPM and the CM as soon as possible. The CQA Officer will work with the CM to develop an appropriate remedy and schedule appropriate corrective actions.

5.1.6 Surveys

Pre- and post-excavation surveys will be conducted by the Contractor in accordance with Section 01050 – Surveying. The surveys will be used to check the limits, grades, elevations, and/or the percentage of the work completed. The CQA Officer will review the progress surveys in a timely manner and notify the Contractor of any non-compliance.

5.1.7 Documentation

The CQA Team will maintain pertinent documentation during excavation activities. The CQA monitoring observations, deficiencies identified, and the corrective action performed will be documented by the CQA Officer. The CQA Team will document CQA activities and provide verification of completed Contractor CQC sampling.

CQA documentation during excavation activities will include (at a minimum) the following:

- Figure depicting CQA/CQC sample locations,
- Photographs of CQA/CQC samples,
- Figure documenting any obstructions noted during excavation.

CQA observations, logs, and test results for the ISS treatment activities will be documented, recorded, and retained in accordance with requirements described in Section 3.

5.2 Material Handling, Management, and Disposal

5.2.1 General

Soils and debris containing suspected hazardous or impacted materials require characterization for waste disposal in accordance with applicable requirements. Soils, debris, and miscellaneous wastes generated during construction activities will be handled and disposed off-site pursuant to applicable federal, state, and local regulations and Specification Sections 02120 – Off-Site Transport and Disposal, and 02145 – Water Treatment and Disposal (Appendix B). All general waste handling, management, characterization, transport, and disposal are the responsibility of the Contractor.

The CQA Team will provide construction oversight to ensure Contractor's methods for handling and disposal of wastes generated during construction adhere to the requirements of the Contract Documents. The CQA Team will conduct CQA sampling of waste materials requiring disposal to verify initial characterization sampling results collected by the Contractor are correct. This section details CQA requirements for the following types of waste materials:

- Soils
- Construction debris, including miscellaneous wastes (decontamination wastes, products, etc.)
- Construction Water

5.2.2 Conformance Testing

The CQA Team will perform routine observations to verify Contractor's material handling, sampling, and disposal activities conform to requirements of the Contract Documents and approved Contractor Work Plans.

There are no specific CQA conformance tests required for waste handling, management, or disposal.

5.2.3 Performance Testing

The Contractor will ensure CQA Team access to materials requiring CQA waste characterization sampling for disposal. All CQA waste characterization samples will be analyzed by an approved CQA Laboratory. CQA waste characterization sampling results will be provided to the CPM prior to disposal.

The CQA Team will perform CQA waste characterization sampling commensurate with Contractor waste characterization sampling. CQA waste characterization samples will be collected at a frequency of one sample for every 10 waste characterization samples collected by the Contractor, for each type of media. At a minimum, one CQA sample will be collected for each waste type. The Contractor will notify the CQA Team 24 hours in advance to collecting waste characterization samples to allow the CQA team the opportunity to collect corresponding samples. If discrepancies between Contractor and CQA waste characterization samples are noted in test results, the larger magnitude of the analytical result(s) will be used for waste classification, characterization, and disposal considerations.

5.2.4 Construction Monitoring

The CQA Team will perform routine observations of the following Contractor activities associated with waste management:

- Construction debris removals,
- Soil excavation, handling, stockpiling,
- Handling, management, and treatment of construction water,
- Stormwater controls,
- Construction water management,
- Decontamination activities,
- Waste characterization sampling,
- Waste transport and disposal activities.

All generated wastes associated with construction will be handled, managed, and disposed of according to the Contract Documents. Pertinent routine observations may include, but are not strictly limited to, the following:

- Generation and verification of potential waste materials (debris, soils, decontamination products, etc.),

- Review of Contractor waste shipping, hauling, disposal documentation or manifests,
- Storage containers, facilities, and methods (stockpiling, etc.) comply with federal, state, and local guidelines,
- Decontamination activities, procedures, and materials,
- Verification of construction water management methods, handling, storage, and treatment,
- Observation of temporary environmental and stormwater controls,
- Contractor waste sampling and characterization activities
- Hauling and disposal operations

5.2.5 Surveys

There are no CQA surveying requirements associated with waste management and disposal.

5.2.6 Documentation

The CQA Team will maintain pertinent documentation during waste generation, handling, sampling, and disposal activities. The CQA monitoring observations, deficiencies identified, and the corrective action performed will be documented by the CQA Officer. The CQA Team will document all sampling CQA sampling activities and provide verification of completed Contractor sampling, characterization, and disposal operations.

5.3 ISS Treatment

5.3.1 General

This Section outlines responsibilities and procedures to ensure the quality of the ISS treatment. The CQA Team will verify the Contractors surveyed layout of treatment cells/columns prior to ISS treatment in the areas and zones designated for ISS treatment. During ISS treatment, the CQA Team will conduct independent routine observations and tests to ensure the ISS treatment conforms to the requirements of the Remedial Design.

5.3.2 Conformance Testing

ISS CQC cores will be collected as part of the Contractor's CQC Plan. The CQA Team will coordinate with the Contractor during the collection of the CQC cores. The CQA Team will visually examine the CQC core concurrently with the Contractor. The CQA Team will not collect separate CQA cores.

The CQC cores will be collected to assess the quality of the ISS mixture, ensuring thorough and complete mixing has been achieved. Additionally, the CQC cores will be visually assessed for anomalies or defects such as cracking, voids, material segregations, insufficient mixing, or presence of NAPL. If any defects are noted, the CQA Team will notify the Contractor of the non-conformance. The Certifying Engineer and Contractor will work together to prepare a Field Change Form for an appropriate corrective action measure to address the defective cells/columns. Any cells/columns that receive corrective action measures will require sampling at the designated frequency concurrent with original sample collection. All CQC core observations will be recorded and documented by the CQA Team.

The CQA Team will assess CQC cores on a frequency of one per every 10 Contractor CQC cores. Core borehole locations will be biased towards areas with the greatest soil impacts, areas where contamination is in direct contact with the bedrock surface, and/or locations where difficulties in the ISS treatment were encountered. To the extent practicable, core boreholes should also be placed in locations where individual treatment cells/columns overlap. Core boreholes should be advanced to at least one foot below the ISS design depth or to bedrock, if encountered. If coring reveals previously undocumented areas of impacts, the CQA Team will notify the Contractor of non-conformance and the Engineer and Contractor will prepare a Field Change Form for a

corrective action measure. Cores will be archived and retained to compare future cores or document issues or areas requiring rework. Cores may be discarded at project close.

Conformance testing via observation of collected cores must be completed early enough to identify potential issues with ISS treatment. To ensure the successful implementation of ISS treatment, the following observations will warrant further attention and be documented during the observation of ISS treatment and CQC core samples:

- A continuous layer or seam of NAPL noted with the core,
- NAPL coating/sheen is visible in the drill wash tub or on drilling tools used to collect core samples,
- Large sections (greater than 1 cubic foot) of unmixed material

CQA observations and conformance test results will be documented and recorded in accordance with requirements described in Section 3.

5.3.3 Performance Testing

The CQA Team will conduct performance testing to ensure the ISS treatment areas are constructed in accordance with the performance requirements specified in the Contract Documents. Performance testing will be conducted on the ISS mixture samples and tested by a qualified CQA laboratory for the following target parameters:

- Unconfined Compressive Strength (UCS; ASTM Method D1633 or equivalent) of 50 psi or more after 28 days of curing for 90% of samples tested,
- Hydraulic Conductivity (ASTM D5084) of 1 x 10^{-6} cm/sec or less

Up to 10% of samples not reaching an UCS of 50 psi after 28 days of curing will be permitted at the discretion of Certifying Engineer.

The CQA Team will coordinate with the Contractor to collect any necessary CQA samples concurrently with the Contractor's CQC samples. The ISS mixture samples will be collected at discrete depths from select mixing cells/columns. The concurrent collection of CQC/CQA samples will allow for representative and accurate comparison of ISS mixtures. CQA samples will be collected at a frequency of one sample per every 500 cubic yards of ISS treatment, or one sample per every 10 Contractor CQC samples.

The CQA Team will collect ISS mixture samples while wet and formed into cylinders in accordance with ASTM D1633 for UCS and ASTM D5084 for hydraulic conductivity. ISS mixture samples will be labeled and traceable to the cells/columns they were collected from. The ISS mixture samples will be packaged and transferred to the CQA Laboratory for UCS and hydraulic conductivity testing.

5.3.4 Construction Monitoring

The CQA Team will conduct routine observations to monitor progress and ensure the quality of ISS mixing, drilling, and grouting operations comply with the Contract Documents.

CQA ISS monitoring includes, but is not limited to this following:

- Verification of proper reagent mixing procedures and processes
- Verification of ISS application equipment and calibration of batch mixing equipment
- Verification of Contractor monitoring and logging of ISS mixture parameters (e.g., grout density, viscosity, temperature, pH, pressures, flow rates, etc.)
- Observations of Contractor CQC sampling and testing

The CQA Team will monitor the treatment depths, real time field data and associated survey data to confirm that the specified ISS treatment depths are achieved as per the ISS Method Selection Flow Chart included in the RDR. The selected Contractor will be responsible for preparing a Construction Plan that describes the proposed means and methods for providing real time field data and survey data during ISS treatment.

The CQA Team will also monitor the verticality and overlap of ISS treatment cells and columns. A minimum 15 percent overlap will be achieved for ISS treatment columns constructed by either auger mixing or jet grouting as confirmed by real time field data and associated survey data. A minimum 3-foot overlap will be achieved for the ISS treatment cells that are constructed via excavator based mixing as confirmed by real time field data and associated survey data. The verticality of the ISS columns/cells will be maintained such that the above specified minimum overlaps are achieved.

5.3.5 Deficiencies

If any of the conformance or performance tests do not meet the criteria described above, or any observations or noted deficiencies are identified during construction, the CQA Team will immediately determine the extent and nature of the deficient materials and/or the work area by additional tests, visual observations, review of records, or other appropriate means. The CQA Team will notify the CPM and the CM as soon as possible. The Certifying Engineer will work with the CM to develop an appropriate remedy and schedule appropriate re-tests and/or re-work of the deficient materials and/or the work area.

If a specified criterion cannot be met, the Contractor will submit suggested solutions or alternatives to the Certifying Engineer and the CPM for review and approval.

5.3.6 Surveys

The Contractor will be required to delineate the limits of each ISS column/cell. The limits and elevations of each column/cell will be surveyed, staked, and labeled prior to the start of ISS applications. The CQA Team will observe and verify the ISS column/cell layout and limits conform to the requirements of the Remedial Design.

Final grade elevations of ISS treatment areas will be surveyed following the completion by the Contractor. The Contractor will provide a Post-ISS Survey documenting the as-built conditions of ISS treatment in accordance with the Contract Documents. The Post-ISS Survey will include the location and layout of installed ISS columns/cells documenting column/cell ID's, dimensions/diameters, overlap requirements, and final top elevations and bottom depth elevations.

The Contractor will provide the Certifying Engineer with the Post-ISS Survey to review for accuracy, completeness, and compliance with the Contract Documents. As-built dimensions, depths, and overlap will be verified by the Certifying Engineer.

5.3.7 Documentation

The CQA Team will maintain pertinent documentation during ISS treatment activities. The CQA monitoring observations, deficiencies identified, and the corrective action performed will be documented by the CQA Officer. The CQA Team will document CQA sampling activities and provide verification of completed Contractor CQC sampling.

CQA documentation during ISS activities will include (at a minimum) the following:

- Figure depicting CQA/CQC sample locations,
- Photographs of CQA/CQC samples,
- Figure documenting any obstructions noted during ISS treatment.

CQA observations, logs, and test results for the ISS treatment activities will be documented, recorded, and retained in accordance with requirements described in Section 3.

5.4 Site Cover System Installation

5.4.1 General

CQA testing and monitoring will be performed during construction of the site cover system. The CQA Team is responsible for documenting the materials and construction of the cover system are conducted in accordance with the Remedial Design. Site cover system construction requirements are provided in the Technical Specifications (including but not limited to Sections 01050 - Surveying, 01732 - Selective Demolition, 02120 – Off-Site Transport and Disposal, 02310 - Rough Grading and Backfill) and this CQAP. CQA testing will consist of conformance testing and performance testing to verify compliance with the Contract Documents. Testing may also be performed as duplicates of the Contractor's CQC tests, or at independently selected locations, or as additional samples at the CQA Officer's discretion.

5.4.2 Site Cover System Materials

Site cover system materials required for the installation of the Site cover system are detailed in the Technical Specifications. Construction details are provided on the Design Drawings. The CQA Team will monitor placement of the site cover system materials to verify compliance with the Technical Specification 02310 – Rough Grading and Backfill.

5.4.3 Conformance Testing

The CQA Team will visually inspect and review the results of the conformance tests performed by the Contractor as part of the required CQC testing. The CQA Team will observe soils and aggregates for deleterious materials (e.g., roots, stumps, debris, foreign objects, etc.). Soils and aggregates containing deleterious materials or failing to comply with the specified material requirements will be rejected and will not be used in construction of the site cover system. The CQA Team will independently conduct testing to confirm that the soil and aggregate materials conform to the requirements in the Technical Specifications. The CQA Team will document and report the conformance testing observations and results.

The CQA Team will test site cover system materials at a frequency of one sample per 10 CQC samples. At a minimum, one CQA sample will be collected for each soil cover system material type.

5.4.4 Performance Testing

During construction, the CQA Team will observe and test the components of the site cover system construction to verify that the materials are installed in accordance with the requirements of the Contract Documents.

The CQA Team will also evaluate the procedures, methods, and equipment used by the Contractor during construction of the cover system. The CQA Team will work closely with the Contractor to monitor the construction of the site cover system and any repairs to identify if any changes in the procedures, methods, and equipment require modification as the cover system construction progresses.

The CQA Team will perform site cover system component tests at a frequency of one sample per 10 CQC samples. At a minimum, one CQA test will be collected for each site cover system component type. CQA tests include lift thickness, moisture content, and in-place density. The CQA tests will be located immediately adjacent to selected CQC test locations for comparison. Individual CQA tests will be representative of the previously installed materials. CQA test results that vary by more than +/- 3% from CQC test results will be considered non-conforming. In the event of non-conforming CQA test results, Contractor will perform additional CQC testing to confirm the area of non-conformance. If possible, the area may be moisture conditioned, reworked, or recompacted as necessary until satisfactory passing CQC test results are obtained. CQA testing will be reperformed to evaluate the rework and CQC retesting.

The frequency of testing may be increased at the discretion of the Certifying Engineer or if variability of the materials is observed. If necessary, the location of routine in-place density tests will be determined using a non-biased sampling approach.

5.4.5 Construction Monitoring

During installation of the site cover system aggregate materials, the CQA Team will visually observe and document in Routine Work Element QA Report Forms (**Attachment A**) the following:

- Changes in consistency of the materials used in construction,
- Soil conditioning as needed (e.g., moisture distribution, particle/clod size, etc.) prior to placement,
- Subgrade conditions (i.e., firm and free of vegetation, organics, standing water or other deleterious materials),
- Thicknesses of loose and compacted lifts and final lift or layer thickness,
- Number of passes required to compact each lift,
- The action of the compaction and heavy hauling equipment on the construction surface (e.g., equipment penetration, pumping, cracking, etc.),
- Desiccation cracks or the presence of ponded water, if any,
- Placement, grading, and compaction of soil and gravel materials to the limits, grades, and elevations in compliance with the Contract Documents,
- Delineation and re-working of nonconforming areas by the Contractor to meet the specified requirements; and
- Damage to completed work and the associated repairs and/or re-work.

5.4.6 Deficiencies

If a deficiency is identified during construction, the CQA Team will immediately determine the extent and nature of the deficient materials and/or the work area by additional tests, visual observations, review of records, or other appropriate means. The CQA Team will notify the CPM and the CM as soon as possible. The Certifying Engineer will work with the CM to develop an appropriate remedy and schedule appropriate re-tests and/or re-work of the deficient materials and/or the work area. After repairs have been made, CQA and CQC retests will be performed to check the repaired areas. In general, CQA tests will be performed at the same frequency as the rest of the project. Additional CQA testing may be performed in suspect areas as deemed necessary.

If a specified criterion cannot be met, the Contractor will submit suggested solutions or alternatives to the Certifying Engineer and the CPM for review and approval.

5.4.7 Surveys

During construction of the site cover system, the CQA Team will review progress surveys submitted by the Contractor. The progress surveys will be used to check the limits, grades, elevations, and/or the percentage of the work completed. Prior to the placement of successive soil or aggregate materials of the site cover system, the CQA Team will review the progress surveys for compliance of the preceding layer thickness, limits, grades and/or elevations. The CQA Officer will review the progress surveys in a timely manner and notify the Contractor of any non-compliance.

5.4.8 Documentation

The CQA Team will maintain pertinent documentation during construction of the soil and aggregate materials of the site cover system. The CQA monitoring observations, sample and test locations, field and laboratory test results, deficiencies identified, and the rework or repairs performed will be documented by the CQA Team.

6.0 REFERENCES

USEPA. 1993. Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities. David E. Daniel and Robert M. Koerner. EPA/600/R-93/182. September 1993.

ATTACHMENTS

PARSONS

Work Element QA Report		
Project No.	Work Area Location	Work Activity Observed
Contractor		
CQA Technician (Preparer)		
Name	Signature	Date
Description/intent of inspection:		
Components/materials reviewed:		
Contractor personnel present:		
Applicable contractor work plan(s) and/or referenced procedure(s):		
Results of observations:		
Deficiencies noted: (Photographs attached, as needed)		
Recommended corrective action:		
Non-conformance(s):		
Attachment(s):		
CQA Officer Name	Signature	Date

Non-Conformance Report		
Project No.	Work Area Location	NCR No.
Contractor		
CQA Officer (Preparer)		
Name	Signature	Date
1. Description of non-conforming item or activity (Attach sheet if necessary)		
2. Recommend corrective action(s)		
3. Recommended resolution and corrective action to prevent reoccurrence (as applicable)		
4. Affected organization		
5. Provide copies of this completed form to the following project personnel:		
Owner Representative		
Project Coordinator		
NYSDEC Representative		
Contractor		
Engineer	Signature	Date
6. Non-Conformance Report Close-Out:		
CQA Officer	Signature	Date

Field Change Form
Date:
Project Number:
Drawing Number:
Specification Number:
Brief Description of the Change:
Reason(s) for the Change:
INITIATED BY: Name (Printed)/ Signature:
Date
APPROVALS: **Design Engineer** Name (Printed)/ Signature:
Date
Contractor Representative: Name (Printed)/ Signature:
Date
Owner (Respondent Representative): Name (Printed)/ Signature:
Date
NYSDEC Representative: Name (Printed)/ Signature:
Date

APPENDIX H
COMMUNITY AIR MONITORING PLAN

COMMUNITY AIR MONITORING PLAN FOR THE FORMER 45TH WEST STREET GAS WORKS SITE OPERABLE UNIT 2 MANHATTAN, NEW YORK

(SITE NO. 231109)

Prepared for:

Consolidated Edison Company of New York, Inc.
31-01 20th Avenue,
Astoria, New York 11105

Prepared by:

301 Plainfield Road, Suite 350
Syracuse, New York 13212

April 2026

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ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
Con Edison	Consolidated Edison Company of New York, Inc.
CSCOs	Commercial Use Soil Cleanup Objectives
ISS	In situ stabilization/solidification
MGP	Manufactured Gas Plant
NAPL	non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PM	particulate matter
ppm	parts per million
Site	Former West 45th Street Gas Works
ug/l	micrograms per liter
VOC	volatile organic compound

1.0 INTRODUCTION

Consolidated Edison Company of New York, Inc. (Con Edison) will be performing remedial construction activities as part of the implementation of the New York State Department of Environmental Conservation (NYSDEC) – selected remedy for Operable Unit 2 (OU-2) of the Consolidated Edison Company of New York, Inc. (Con Edison) Former West 45th Street Gas Works Site located in the borough of Manhattan, in New York City (the Site). The selected remedy is being implemented to address environmental impacts at the Site as presented in the July 2021 Decision Document (NYSDEC 2021).

The Site is located in Manhattan, New York and is bounded by West 46th Street to the north, West 45th Street to the south, and 12th Avenue to the west. The Site historically contained manufactured gas plant (MGP) structures which contributed to presence of NAPL-impacted soils in the subsurface.

This Community Air Monitoring Plan (CAMP) has been prepared for the intrusive activities to be performed at the Site. This CAMP is not intended for use in establishing action levels for worker respiratory protection; rather, it is intended to provide a measure of protection from potential airborne nuisance constituents for the downwind community, including on-site workers not directly involved with the intrusive field activities, abutting commercial businesses and their customers, and the public in general. The action levels and procedures specified herein require continued and increased monitoring, corrective actions to better control emissions, and/or temporary work activity shutdown. Implementation of this CAMP also serves to document that field activities did not expose the public to airborne nuisance constituents emanating from the intrusive field activities performed at the Site.

2.0 BASIS FOR CAMP

2.1 Purpose and Objectives

The New York State Department of Health (NYSDOH) Generic CAMP requires real-time monitoring for volatile organic compounds (VOCs) and particulates (dust) at the upwind and downwind perimeter of work areas when intrusive field activities are conducted at impacted sites. In general, the purpose of this CAMP is to comply with the NYSDOH Generic CAMP to ensure that the community and public are not exposed to hazardous constituents at levels above accepted guidance and reference limits during the intrusive field activities being conducted at the Site. Special requirements for work within 20 feet of potentially exposed individuals or structures will also be considered.

Specific objectives of the Site CAMP are as follows:

- Provide an early warning system to alert Con Edison's field team that concentrations of target compounds in ambient air are approaching action levels due to intrusive field activities;
- Assess and monitor whether vapor and dust emission control measures are effective in maintaining or reducing ambient air levels of target compounds below action levels, allowing appropriate adjustments to be made (if necessary); and
- Develop a comprehensive and permanent record of air monitoring and sampling results, equipment calibration and maintenance records, daily Site log notes and other pertinent information related to the CAMP.
- When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures.

2.2 Odor, Vapors, and Dust Control

The target compounds for this CAMP are those contaminants known or suspected to be present in MGP source materials generated during former MGP operations at the Site and have the potential to be released into the ambient air during intrusive field activities. Also included are contaminants generated by the intrusive field activities that have the potential to be released to the air and to migrate beyond the Site perimeter (i.e., dust). The target compounds will consist of total VOCs and dust (particulate matter [PM_{10}]).

3.0 SCOPE OF WORK

3.1 Overview and Schedule

The key elements proposed to meet the objectives of this CAMP consist of the following:

- Data collection from locations that account for upwind/downwind prevailing wind direction patterns relative to the primary areas of intrusive field activities; Data collection during the daily working hours of intrusive field activities. Data collection during the intrusive work will allow monitoring for action levels and will document air quality during the intrusive field activities at the perimeter of the Site, and
- Data collection during the full duration of intrusive field activities. Data collection during the intrusive work will allow monitoring for action levels and will document air quality during the intrusive field activities at the perimeter of the Site, and
- Primary monitoring by real-time methods of the target compounds. Real-time monitoring data will be made available to Con Edison's field team, the New York State Department of Environmental Conservation (NYSDEC), and the NYSDOH.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

The CAMP will be approved and implemented before intrusive field activities begin, and once monitoring commences, it will be continuous during implementation of intrusive work.

3.2 Monitoring Locations

Four (4) portable monitoring station locations will be deployed at the Site. The number and location of these stations were selected based on several factors summarized as follows:

- The overall size of the Site and lateral extent of the intrusive work area; and
- The location of the commercial businesses adjacent to the Site.

The intrusive work area will be limited to the boundaries of the Site and will include the specific locations where excavation activities and ISS implementation will occur. Coverage will be accomplished by placing one to two monitoring stations directly upwind, and one to two monitoring stations downwind of the prevailing wind direction. In addition, should separate intrusive activities be conducted in two different locations of the Site, separate upwind and downwind monitoring stations may be set up for each of the two intrusive work locations. The locations of the monitoring stations will be adjusted as necessary to account for upwind/downwind prevailing wind direction patterns relative to the areas of intrusive activities.

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.

3.3 Real-Time Monitoring

Real-time monitoring utilizing a portable air monitoring system will be used as the primary measurement for total VOCs and PM_{10}. Real-time monitoring will be performed at the locations during intrusive work activities.

Each portable air monitoring station will be equipped with a VOC meter to monitor total VOCs and a particulate material meter configured for PM_{10} (DustTrak). Each meter will be equipped with data logging capabilities. Air monitoring equipment will be contained in a weatherproof case enclosure mounted on a tripod. The data collection will consist of total VOCs and PM_{10} at each monitoring station.

Each monitoring station will be equipped with visual and audible alarms. Visual alarms will consist of flashing lights mounted on top of the air monitoring stations. The visual alarms will be triggered when a primary action level is exceeded.

3.4 Monitoring Personnel

Monitoring activities will be performed by appropriately trained staff. Required training includes completion of a 40-hour hazardous waste activities training course in compliance with OSHA Standard 29 CFR 1910, as well as an 8-hour refresher course within the last year. Monitoring personnel will also be trained in the calibration, operation, and routine maintenance of the specific monitoring equipment being utilized.

3.5 Reporting

Con Edison's on-site consultant will prepare a daily summary of the 15-minute average community air monitoring results (for VOCs and PM_{10}) to be submitted to Con Edison, NYSDEC, and NYSDOH. The summary will also include, but not be limited to, minimum, maximum and average air monitoring results (for VOCs and PM10), a description of community air monitoring sustained exceedances (if any), work activities associated with the sustained exceedances, and corrective actions implemented to address the sustained exceedances.

The time and outcome of each MGP-related odor perimeter check will be documented in a daily log, specifically noting the presence or absence of MGP-related odors and identifying the general location(s) along the perimeter where MGP-related odors (if any) are noticed. These daily logs, as well as documentation of any odor complaints received from the public, will be included in the daily CAMP reports to be submitted to Con Edison, NYSDEC, and NYSDOH.

The daily summary will be submitted in an electronic format to the Con Edison, NYSDEC, and NYSDOH representatives listed in Table 3-1. A copy of the data will be maintained at the field office trailer.

Table 3-1. CAMP Contact List

Name	Affiliation	Contact Information
Greta Kowalski	NYSDEC	T: 518 402-2029 greta.kowalski@dec.ny.gov
Anthony Perretta	NYSDOH	T: 518.486.7186 beei@health.ny.gov
Matt Levinson	Con Edison	T: 646-385-1691 levinsonm@coned.com

4.0 DATA COLLECTION METHODPLOGIES

Data collection methodologies will consist of real-time monitoring methods. The real-time monitoring system will be equipped with data logging capabilities capable of calculating 15-minute running average concentrations and storing 24 hours of data.

4.1 VOCs

A MiniRAE 3000 (or equivalent) will be utilized for the real-time total VOC measurement portion of the CAMP. MiniRAE 3000 technology allows dependable, linear, part-per-million range readings for VOCs. MiniRAE 3000-based measurements are easy to perform, accurate, and a proven monitoring approach. Appendix B includes a data sheet for the MiniRAE 3000.

4.2 Particulate Matter (PM_{10})

A DustTrak Aerosol Monitor 8530 (or equivalent) will be employed for the real-time total PM_{10} measurement portion of the CAMP. This instrument is capable of measuring PM_{10} in a range including the action levels (100 – 150 micrograms per cubic meter [ug/m^3]) and with appropriate resolution (1 ug/m^3 or better). The DustTrak is a light-scattering photometer that uses optical measurement techniques, a commonly used, widely available, and versatile monitoring approach. Photometer-based PM_{10} measurements are easy to perform, accurate, and a time-proven monitoring approach. Appendix B includes a data sheet for the DustTrak Aerosol Monitor 8530.

5.0 ACTION LEVELS AND PROCEDURES

There are two types of action levels for VOCs and PM_{10} which are assessed on a relative basis (i.e., a downwind concentration is compared to an upwind concentration to see if the action level is triggered).

5.1 Action Levels

Refer to Table 1 for action levels that have been established for the CAMP.

5.1.1 VOCs

The primary action level for total VOCs is 5 ppm based on a 15-minute averaging period and is assessed on a relative basis between downwind and upwind measurements. This action level will be reached if a 15-minute average total VOCs level measured at the downwind stations exceeds the action level for the same 15-minute period at the designated upwind station by 5 ppm for VOCs. If the action level is triggered and is sustained over a 15-minute period, then work activities will be temporarily halted and monitoring continued until the downwind total measured concentrations decrease to below action levels relative of the upwind concentrations, then work activities can be resumed.

If downwind total VOC levels persist at concentrations between 5 - 25 ppm above the upwind level over a sustained 15-minute period, then:

- Work activities will be halted;
- The source of vapors identified;
- Corrective actions implemented to abate emissions; and
- Monitoring continued.

Following completion of these steps, work activities will resume provided that total concentrations of target compounds 200 feet downwind of the work area, or half the distance to the nearest potential receptor, whichever is less, but in no case less than 20 feet, are below specified action levels over the background for the 15-minute average.

After the implementation of vapor control measures or at any time, if downwind total VOC levels exceed the secondary action level of 25 ppm over the upwind level, then work will be stopped and a meeting will be held with the Con Edison's field team to re-evaluate work activities, vapor control measures, and recommend further corrective actions.

Work can only resume if vapor control measures are successful in reducing downwind total VOC concentration levels to less than 5 ppm above the upwind level.

5.1.2 Particulate Matter (PM_{10})

The primary action level for PM_{10} is 100 ug/m^3 based on a 15-minute averaging period and it is assessed on a relative basis between downwind and upwind measurements. This action level will be reached if a 15-minute average PM_{10} level measured at the downwind station exceeds the PM_{10} level for the same 15-minute period at the upwind station by 100 ug/m^3. Additionally, the action level will also be reached if visible emissions of airborne dust are observed migrating beyond the Site perimeter. If the PM_{10} action level is triggered by either of these events, then dust suppression techniques must be employed and monitoring continued.

If downwind PM_{10} levels persist at readings between 100 - 150 ug/m^3 above the upwind level for 45 minutes (three measurement cycles), work activities may resume with dust suppression techniques in place, but only if no visible emissions of dust are observed migrating beyond the Site perimeter.

After the implementation of dust control measures, if downwind PM_{10} levels continue to persist above the secondary action level of 150 ug/m^3 over the upwind level or 100 ug/m^3 over the upwind level with visible emissions present, then work must be stopped and a meeting will be held with Con Edison's field team to re-evaluate work activities, dust suppression measures, and recommend further corrective actions.

Work can resume once dust control measures are successful in reducing downwind PM_{10} levels to less than 150 ug/m^3 above the upwind level and there is no visible dust migration beyond the perimeter of the Site.

6.0 MGP RELATED ODOR MONITORING

During working hours, Con Edison's onsite consultant will perform periodic walks around the perimeter of the work area(s) to monitor for MGP-related odors. These perimeter checks will be performed more frequently, as necessary, depending on the work being performed and meteorological factors such as change in wind direction. Meteorological factors that can influence odor generation and dissemination generally include temperature, humidity, precipitation, atmospheric pressure, wind direction, and wind speed. These factors can work synergistically with a positive or negative impact on MGP-related odor generation and transport/dispersion. For example, MGP-related odors generally tend to be less prevalent with lower temperatures, precipitation, or high humidity. Additionally, MGP-related odor dissemination is greatly influenced by wind direction and wind speed. Meteorological factors will be monitored during the remedial construction activities.

If MGP-related odors are noticed along the perimeter of the Site, work will continue and odor-, vapor-, and dust-suppression techniques will be employed to abate emissions. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate, and more frequent checks of the work area perimeter for MGP-related odors will be performed.

Odor complaints (if any) will be directed to Con Edison's onsite consultant. The legitimacy of the complaint will be verified based on the work activities being performed, the predominant wind direction, and other meteorological factors. In response to verified odor complaints, perimeter monitoring will continue, and additional odor, vapor, and dust controls will be employed on exposed Site soils. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate.

If MGP-related odors continue to be noticed at the perimeter of the Site, work will be stopped while activities are re-evaluated. The source or cause of the MGP-related odors will be identified and additional modifications of construction techniques or additional methods to abate emissions will be implemented. Work will resume provided the measures are successful at abating the odors noticed along the Site perimeter. If the odor complaint cannot be resolved through implementation of the stated controls, NYSDEC will then investigate the complaint further.

7.0 METEOROLOGICAL MONITORING

Meteorological monitoring will be conducted continuously at the Site using a portable meteorological monitoring system. The meteorological monitoring system will be deployed at a location in accordance with siting criteria established by the United States Environmental Protection Agency (USEPA) and NYSDEC for meteorological monitoring systems (Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements, as revised August 1989; and New York State Air Guide-19 – "Oversight of Private Air Monitoring Networks," dated June 1989). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. A digital meteorological monitoring system will be used to collect the meteorological data. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity, and ambient temperature. The meteorological monitoring system will be equipped with electronic data-logging capabilities.

8.0 QUALITY ASSURANCE

8.1 Equipment Calibration

Field analytical equipment will be calibrated immediately prior to each day's use and throughout the day or as otherwise deemed necessary by the engineer or regulatory authority. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the CAMP. Records of all instrument calibration and instrument manuals will be maintained on-site.

8.2 Preventive Maintenance Procedures

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the CAMP operator. A list of critical spare parts will be established, and these spare parts will be available for use in order to avoid downtime. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed and maintained at the Site.

9.0 REFERENCES

New York State Air Guide-19 – "Oversight of Private Air Monitoring Networks," dated June 1989

NYSDOH Generic Community Air Monitoring Plan (CAMP)

Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements, as revised August 1989

TABLES

Table 1

Action Levels and Procedures

Contaminant	Action Level	Action Taken
VOCs	< 5 ppm above background	None
	5 - 25 ppm above background	Temporarily halt work and continue monitoring. If levels decrease to < 5 ppm above background, resume work. If levels persist for 30 minutes, hold Site meeting with field personnel to review work activities. If levels persist for 45 minutes, stop work, identify source, implement corrective action, and continue monitoring.
	> 25 ppm above background	Stop work and hold meeting. Resume work only if levels are reduced to < 5 ppm above background.
Particulate Matter (PM_{10})	<100 ug/m^3 above background and no visible off-site dust migration	None
	100–150 ug/m^3 above background or visible off-site dust migration	Employ dust suppression techniques and continue monitoring. If levels persist for 45 minutes, continue work with dust suppression only if no visible off-site dust migration. If visible off-site dust migration persists for 45 minutes, stop work, identify source, implement corrective action, and continue monitoring. Resume work only if no visible off-site dust migration.
	>150 ug/m^3 above background	Stop work and hold site meeting. Resume work only if levels are reduced to < 150 ug/m^3 above background and no visible off-site dust migration.

APPENDIX A
NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX B
EQUIPMENT DATA SHEETS

RAE SYSTEMS by Honeywell

MiniRAE 3000

Portable Handheld VOC Monitor



The MiniRAE 3000 is a comprehensive handheld VOC (Volatile Organic Compound) monitor that uses a third-generation patented PID technology to accurately measure more ionizable chemicals than any other device on the market. It provides full-range measurement from 0 to 15,000 ppm of VOCs.

The MiniRAE 3000 has a built-in wireless modem that allows real-time data connectivity with the ProRAE Guardian command center located up to 2 miles (3 km) away through a Bluetooth connection to a RAELink 3* portable modem or optionally via Mesh Network.

- **Highly accurate VOC maeasurements**
- **Patented PID sensor**
- **Low maintenance—easy access to lamp and sensor**
- **Low cost of ownership**
- **3-year 10.6eV lamp warranty**

KEY FEATURES

- Third-generation patented PID technology
- VOC detection range from 0 to 15,000 ppm
- 3-second response time
- Humidity compensation with built-in humidity and temperature sensors
- Six-month datalogging
- Real-time wireless built-in – Bluetooth (and optional RAELink3 portable modem) or Mesh Network support
- Large graphic display with integrated flashlight
- Multi-language support with 10 languages encoded
- IP- 67 waterproof design

APPLICATIONS

- Oil and Gas
- HazMat
- Industrial Safety
- Civil Defense
- Environmental and Indoor Air Quality



Workers can quickly measure VOCs and wirelessly transmit data via Bluetooth or optional Mesh radio.

*RAELink 3 modem is sold separately.

Wireless | AutoRAE 2 Compatible | ATEX | ISO 9001 CERTIFIED

MiniRAE 3000

Portable Handheld VOC Monitor

SPECIFICATIONS

Instrument Specifications

Size	10" L x 3.0" W x 2.5" H (25.5 cm x 7.6 cm x 6.4 cm)
Weight	26 oz (738 g)
Sensors	Photoionization sensor with standard 10.6 eV or optional 9.8 eV or 11.7 eV lamp
Battery	• Rechargeable, external field-replaceable Lithium-Ion battery pack • Alkaline battery adapter
Running time	16 hours of operation (12 hours with alkaline battery adapter)
Display Graphic	4 lines, 28 x 43 mm, with LED backlight for enhanced display readability
Keypad	1 operation and 2 programming keys, 1 flashlight on/off
Direct Readout	Instantaneous reading • VOCs as ppm by volume (mg/m3) • High values • STEL and TWA • Battery and shutdown voltage • Date, time, temperature
Alarms	95dB at 12" (30 cm) buzzer and flashing red LED to indicate exceeded preset limits • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms latching with manual override or automatic reset • Additional diagnostic alarm and display message for low battery and pump stall
EMC/RFI	Compliant with EMC directive (2004/108/EC) EMI and ESD test: 100MHz to 1GHz 30V/m, no alarm Contact: ±4kV Air: ±8kV, no alarm
IP Rating	• IP-67 unit off and without flexible probe • IP-65 unit running
Datalogging	Standard 6 months at one-minute intervals
Calibration	Two-point or three-point calibration for zero and span. Calibration memory for 8 calibration gases, alarm limits, span values and calibration dates
Sampling Pump	• Internal, integrated flow rate at 500 cc/mn • Sample from 100' (30m) horizontally or vertically
Low Flow Alarm	Auto pump shutoff at low-flow condition
Communication & Data Download	• Download data and upload instrument set-up from PC through charging cradle or optional Bluetooth™ • Wireless data transmission through built-in RF modem
Wireless Network	Mesh RAE Systems Dedicated Wireless Network
Wireless Range (Typical)	EchoView Host: LOS > 660 ft (200 m) ProRAE Guardian & RAEMesh Reader: LOS > 660 ft (200 m) ProRAE Guardian & RAELink3 Mesh: LOS > 330 ft (100 m)
Safety Certifications	**US and Canada**: CSA, Classified as Intrinsically Safe for use in Class I, Division 1 Groups A, B, C, D **Europe**: ATEX II 2G EEx ia IIC T4
Temperature	-4° to 122° F (-20° to 50° C)
Humidity	0% to 95% relative humidity (non-condensing)

[1] Contact RAE Systems for country-specific wireless approvals and certificates.

Specifications are subject to change.

Attachments	Durable bright yellow rubber boot
Warranty	3 years for 10.6 eV lamp, 1 year for pump, battery, sensor and instrument
Wireless Frequency	ISM license-free band. IEEE 802.15.4 Sub 1GHz
Wireless Approvals	FCC Part 15, CE R&TTE, Others[1]
Radio Module	Supports Bluetooth or RM900

Sensor Specifications

Gas Monitor	Range	Resolution	Response Time T90
VOCs	0 to 999.9 ppm 1,000 to 15,000 ppm	0.1 ppm 1 ppm	< 3 s < 3 s

MONITOR ONLY INCLUDES:

- MiniRAE 3000 Monitor, Model PGM-7320
- Wireless communication module built in, as specified
- Datalogging with ProRAE Studio II Package
- Charging/download adapter
- RAE UV lamp, as specified
- Flex-I-Probe™
- External filter
- Rubber boot
- Alkaline battery adapter
- Lamp-cleaning kit
- Tool kit
- Operation CD-ROM
- Operation and Maintenance manual
- Soft leather case

OPTIONAL CALIBRATION KIT ADDS:

- 100 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

OPTIONAL GUARANTEED COST-OF-OWNERSHIP PROGRAM:

- 4-year repair and replacement guarantee
- Annual maintenance service

CORPORATE HEADQUARTERS

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DS-1018-05 02/16

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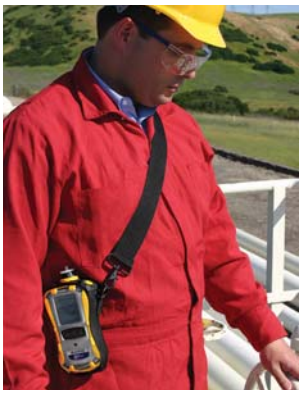
Honeywell
RAE SYSTEMS

MultiRAE

Wireless portable six-gas monitor with advanced VOC detection capability

The MultiRAE is the most advanced portable chemical detector on the market. The MultiRAE delivers the broadest PID sensor range in its class and the versatility to support 25 intelligent interchangeable sensor options (such as PID, NDIR for combustibles and CO_2, ammonia, chlorine, formaldehyde, and phosphine) to fully meet the monitoring needs in a variety of applications, including industrial hygiene, personal protection, leak detection, and HazMat response.

The MultiRAE's optional wireless capability improves safety by providing commanders and safety of cers real-time access to instrument readings and alarm status from any location[1] for better situational awareness and faster incident response.



MultiRAE used for worker exposure monitoring at an oil refinery

Applications

- Industrial hygiene, personal protection, and leak detection in industries such as:
  - Aviation (wingtankentry)
  - Chemical
  - Environmental
  - Oil and gas
  - Pharmaceutical
  - Shipping/marine
- HazMat response
- Clandestine drug labs



- *Highly versatile and customizable*
- *Best PID in its class (0 to 5,000 ppm range, 0.1 ppm resolution)*
- *Man Down Alarm with real-time remote wireless notifcation*
- *Compliant with MIL-SPEC-810G performance standard*
- *Fully automatic bump testing and calibration with AutoRAE 2*

FEATURES & BENEFITS

- Wireless access to real-time instrument readings and alarm status from any location[1]
- Unmistakable five-way local and remote wireless notification of alarm conditions, including Man Down Alarm[1]
- Intelligent sensors store calibration data, so they can be swapped in the field[2]
- Extensive on-board gas libraries (190 VOCs and 55 combustible gases)
- Largest display in its class
- Continuous datalogging (6 months for 5 sensors, 24x7)
- Device Management with Honeywell SafetySuite

MultiRAE Specifications

INSTRUMENT SPECIFICATIONS[4]	
SIZE	7.6" H x 3.8" W x 2.6" D (193 x 96.5 x 66 mm)
WEIGHT	31 oz (880 g)
SENSORS	25 intelligent interchangeable field-replaceable sensors including PID for VOCs, electrochemical sensors for toxic gases and oxygen, combustible LEL and NDIR sensors, and CO_2 NDIR sensor
BATTERY OPTIONS, RUNTIME[5] AND RECHARGE TIME	- Rechargeable Li-ion (~12-hr. runtime, < 6-hr. recharge time) - Extended duration Li-ion (~18-hr. runtime, < 9-hr. recharge time) - Alkaline adapter with 4 x AA batteries (~6-hr. runtime)
DISPLAY	Monochrome graphical LCD display (128 x 160) with backlighting. Automatic screen "flip" feature.
DISPLAY READOUT	- Real-time reading of gas concentrations; PID measurement gas and correction factor; Man Down Alarm on/off; visual compliance indicator; battery status; datalogging on/off; wireless on/off and reception quality. - STEL, TWA, peak, and minimum values
KEYPAD BUTTONS	3 operation and programming keys (Mode, Y/+, and N/-)
SAMPLING	Built-in pump. Average flow rate: 250 cc/min. Auto shutoff in low-flow conditions
CALIBRATION	Automatic with AutoRAE 2 Test and Calibration System or manual
ALARMS	Wireless remote alarm notification; audible (95 dB @ 30 cm), vibration, visible (flashing bright red LEDs), and on-screen indication of alarm conditions - Man Down Alarm with pre-alarm and real-time remote wireless notification[1]
DATALOGGING	Continuous datalogging (6 months for 5 sensors at 1-minute intervals, 24/7) - User-configurable datalogging intervals (from 1 to 3,600 seconds)
COMMUNICATION AND DATA DOWNLOAD	- Data download and instrument set-up and upgrades on PC via desktop charging and PC comm. cradle, travel charger, or AutoRAE 2 Automatic Test and Calibration System - Wireless data and alarm status transmission via built-in RF modem (optional)
WIRELESS NETWORK	ProRAE Guardian Real-Time Wireless Safety System or EchoView Host-based Closed-Loop System
WIRELESS RANGE (TYPICAL)	MultiRAE to RAELink3 [Z1] Mesh modem ~330 feet (100 meters) MultiRAE to EchoView Host, RAEMesh Reader or RAEPoint ~660 feet (200 meters) MultiRAE to Wi-Fi Access Point ~330 feet (100 meters)
OPERATING TEMPERATURE	-4° to 122°F (-20° to 50°C)
HUMIDITY	0% to 95% relative humidity (non-condensing)
DUST AND WATER RESISTANCE	IP-65 ingress protection rating (dust-tight and waterproof against hosing jets coming from all directions)
SAFETY CERTIFICATIONS	CSA: Class I, Division 1, Groups A, B, C and D, T4 Class II, Division 1; Groups E, F, G; T85°C ATEX: 0575 II 1G Ex ia IIC T4 Ga 2G Ex ia d IIC T4 Gb with IR Sensor installed I M1 Ex ia I Ma IECEx: Ex ia IIC T4 Ga Ex ia d IIC T4 Gb with IR Sensor installed I M1 Ex ia I Ma IECEx/ANZEx: Ex ia IIC T4 Ga Ex ia d IIC T4 Gb with IR Sensor installed Ex ia I Ma
EMC/RFI	EMC directive: 2004/108/EC
PERFORMANCE TESTS	MIL-STD-810G and 461F compliant. LEL CSA C22.2 No. 152; ISA-12.13.01
LANGUAGES	Arabic, Chinese, Czech, Danish, Dutch, English, French, German, Indonesian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, and Turkish
WARRANTY	- Four years on Liq O_2 sensors - Three years on CO and H_2S sensors - Two years on non-consumable components and catalytic LEL sensors - One year on all other sensors, pump, battery, and other consumable parts
WIRELESS FREQUENCY	ISM license free band. IEEE 802.15.4 Sub 1GHz, Wi-Fi 802.11 b/g
WIRELESS APPROVALS	FCC Part 15, CE R&TTE, Others[6]
RADIO MODULE	Supports RM900A

SENSOR SPECIFICATIONS[4]	RANGE	RESOLUTION
PID SENSORS		
VOC 10.6 EV (EXT. RANGE)	0 to 5,000 ppm	0.1 ppm
COMBUSTIBLE SENSORS		
CATALYTIC LEL	0 to 100% LEL	1% LEL
NDIR (0-100% LEL METHANE)	0 to 100% LEL	1% LEL
NDIR (0-100% VOL. METHANE)	0 to 100% Vol.	0.1% Vol.
CARBON DIOXIDE SENSOR		
CARBON DIOXIDE (CO_2) NDIR	0 to 50,000 ppm	100 ppm
ELECTROCHEMICAL SENSORS		
AMMONIA (NH_3)	0 to 100 ppm	1 ppm
CARBON MONOXIDE (CO)	0 to 500 ppm	1 ppm
CARBON MONOXIDE (CO), EXT. RANGE	0 to 2,000 ppm	10 ppm
CARBON MONOXIDE (CO), H_2-COMP.	0 to 2,000 ppm	10 ppm
CARBON MONOXIDE (CO) + HYDROGEN SULFIDE (H_2S) COMBO	0 to 500 ppm 0 to 200 ppm	1 ppm 0.1 ppm
CHLORINE (CL_2)	0 to 50 ppm	0.1 ppm
CHLORINE DIOXIDE (CLO_2)	0 to 1 ppm	0.03 ppm
ETHYLENE OXIDE (ETO-A)	0 to 100 ppm	0.5 ppm
ETHYLENE OXIDE (ETO-B)	0 to 10 ppm	0.1 ppm
FORMALDEHYDE (HCHO)	0 to 10 ppm	0.05 ppm
HYDROGEN CYANIDE (HCN)	0 to 50 ppm	0.5 ppm
HYDROGEN SULFIDE (H_2S)	0 to 100 ppm	0.1 ppm
METHYL MERCAPTAN (CH_3-SH)	0 to 10 ppm	0.1 ppm
NITRIC OXIDE (NO)	0 to 250 ppm	0.5 ppm
NITROGEN DIOXIDE (NO_2)	0 to 20 ppm	0.1 ppm
OXYGEN (O_2) OXYGEN (LIQ O_2)	0 to 30% Vol. 0 to 30% Vol.	0.1% Vol. 0.1% Vol.
PHOSPHINE (PH_3)	0 to 20 ppm	0.1 ppm
PHOSPHINE (PH_3 H)	0 to 20 ppm	0.1 ppm
SULFUR DIOXIDE (SO_2)	0 to 20 ppm	0.1 ppm

[1] *Additional equipment and/or software licenses may be required to enable remote wireless monitoring and alarm transmission.*
[2] RAE Systems recommends calibrating sensors on installation.
[3] *A two-gas combination sensor is required for a 6-gas configuration.*
[4] *Specifications are subject to change.*
[5] *Specification for non-wireless monitors.*
[6] *Contact RAE Systems for country specific wireless approvals and certificates.*

Ordering Information (MODEL: PGM-6228)

- Wireless[1] and non-wireless configurations are available
- Refer to the Portables Pricing Guide for part numbers for monitors, accessories, sampling and calibration kits, gas, sensors, and replacement parts

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Datasheet_MultiRAE_DS-1070-11_US-EN
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Honeywell

DUSTTRAK™ II AEROSOL MONITORS MODELS 8530, 8530EP AND 8532

DESKTOP OR HANDHELD UNITS FOR ANY ENVIRONMENT, ANY APPLICATION



DustTrak™ II Aerosol Monitors are battery-operated, data-logging, light-scattering laser photometers that give you real-time aerosol mass readings. They use a sheath air system that isolates the aerosol in the optics chamber to keep the optics clean for improved reliability and low maintenance. From desktop and desktop with external pump models to a handheld model, the DustTrak II offers a suitable solution for harsh industrial workplaces, construction and environmental sites and other outdoor applications, as well as clean office settings. The DustTrak II monitors measure aerosol contaminants such as dust, smoke, fumes and mists.

Features and Benefits

All Models

+ Real-time mass concentration readings and data-logging allow for data analysis during and after sampling
+ Measure aerosol concentrations corresponding to PM1, PM2.5, Respirable, and PM10 size fractions, using a variety of inlet conditioners
+ Easy-to-use graphical user interface with color touch-screen for effortless operation

Handheld Model (8532)

+ Long life internal pump for continuous sampling
+ Single-point data collection for walk through surveys
+ Lightweight design with ergonomic handle for portable applications

Desktop Models (8530 and 8530EP)

+ Energy-efficient, long lasting external pump for continuous, unattended, 24/7, outdoor monitoring applications (Model 8530EP only)
+ Long life internal pump for shorter work-shift or IAQ sampling applications (Model 8530)
+ Gravimetric reference sampling capability for custom reference calibrations
+ Automatic zeroing (with optional zero module) to minimize the effect of zero drift
+ STEL alarm setpoint for tracking 15-minute average mass concentrations
+ Environmental protected and tamper-proof secure (with an optional environmental enclosure)
+ Inlet sample conditioning (with optional heated inlet sample conditioner) to reduce the effect of humidity on photometric mass measurements (for use with an environmental enclosure)
+ Cloud Data Management System as hosted by Netronix™

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Desktop Models: Ideal for Long-Term Surveys and Remote Monitoring Applications

The DustTrak II is offered as a standard desktop (Model 8530), as well as a desktop with external pump (Model 8530EP.) Both models have manual and programmable data logging functions, making them ideal for unattended applications. The standard desktop model is most suitable for indoor, continuous monitoring, while the desktop with external pump is designed for 24/7 unattended, remote monitoring outdoors.

The DustTrak II desktop models come with USB (device and host), Ethernet, and analog and alarm outputs allowing remote access to data. User adjustable alarm setpoints for instantaneous or 15-minute short-term excursion limit (STEL) are also available on desktop models. The alarm output with user-defined setpoint alerts you when upset or changing conditions occur.

The DustTrak II desktop monitors have several unique features:

+ Measure aerosols in high concentrations up to 400 mg/m3.
+ External pump (Model 8530EP) with low power consumption for continuous, unattended monitoring in remote outdoor locations.
+ Gravimetric sampling capability using a 37-mm filter cassette which can be inserted in-line with the aerosol stream allowing you to perform an integral gravimetric analysis for custom reference calibrations.
+ Zeros automatically using the external zeroing module. This optional accessory is used when sampling over extended periods of time. By zeroing the monitor during sampling, the effect of zero drift is minimized.
+ STEL alarm feature for tracking 15-minute average mass concentrations when alarm setpoint has been reached for applications like monitoring fugitive emissions at hazardous waste sites.
+ Provide for environmental protection and tamper-proof security using an environmental enclosure. This optional accessory encloses the instrument within a waterproof, lockable, custom-designed case.
+ Condition the sample air stream before entering the instrument optics using a heated inlet sample conditioner (designed for use with an environmental enclosure.) This optional accessory is used in humid environments. By conditioning the sample, the humidity and water vapor are minimized, reducing elevated measurements.

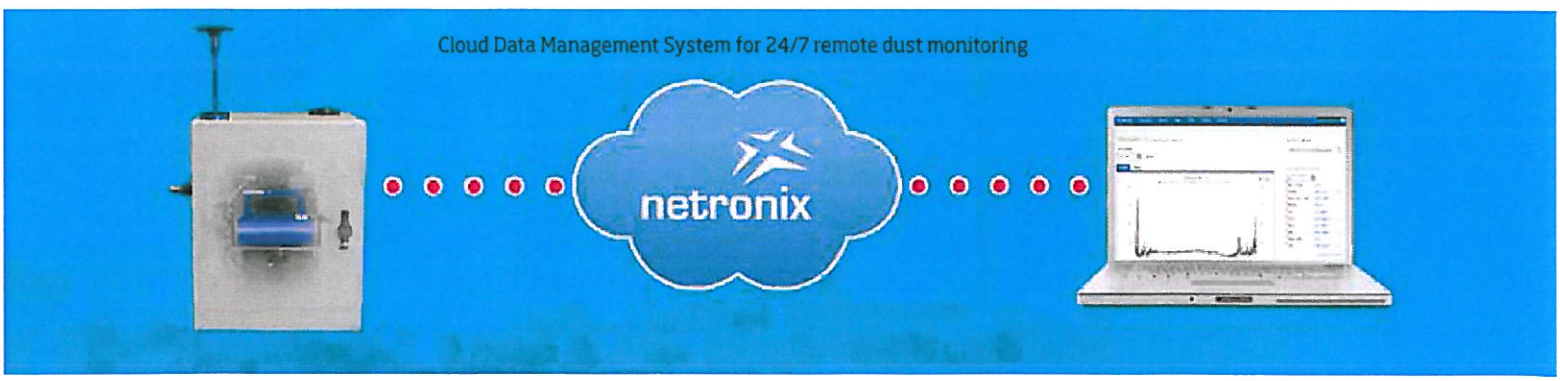
Handheld Models: Perfect for Walk-Through Surveys and Single-Point Data Collection Applications

The DustTrak II Handheld Model 8532 is lightweight and portable. It is perfect for industrial hygiene surveys, point source location monitoring, indoor air quality investigations, engineering control evaluations/validation, and for baseline trending and screening. Like the desktop models, it has manual and programmable data logging functions. In addition, the handheld model also has a single-point data logging capability. Single-point data collection is used for walk-through industrial hygiene surveys and indoor air quality investigations.

Applications	Desktop	Handheld
Aerosol research studies	+	+
Baseline trending and screening	+	+
Engineering control evaluations		+
Engineering studies		+
Epidemiology studies	+	+
Indoor air quality investigations	+	+
Industrial/occupational hygiene surveys	+	+
Point source monitoring		+
Outdoor environmental monitoring	+	
Process monitoring	+	+
Remote monitoring	+	
Battery Performance		
Models 8530 and 8530EP (Typical) 6600 mAH Li-Ion Battery Pack (P/N 801680)	1 Battery	2 Batteries
Battery runtime (hours)	Up to 6	Up to 12
Charge time* (hours) in DustTrak	4	8
Charge time* (hours) in external battery charger (P/N 801685)	4	8

Model 8532 (Typical) 3600 mAH Li-Ion Battery Pack (P/N 801681)	Battery
Battery runtime (hours)	Up to 6
Charge time* (hours) in DustTrak	4
Charge time* (hours) in external battery charger (P/N 801686)	4

* Of a fully depleted battery



DustTrak II Aerosol Monitor Features

All Models

+ Li-Ion rechargeable batteries
+ Internal and external battery charging capabilities
+ Outlet port for isokinetic sampling applications
+ User serviceable sheath flow and pump filters
+ Logged test pause and restart feature
+ Logged test programming
  + Color touch screen–either manual mode or program mode
  + TrakPro™ Data Analysis Software via a PC
+ User adjustable custom calibration settings
+ Instantaneous alarm settings with visual and audible warnings
+ Real-time graph display
+ View statistical information during and after sampling
+ On-screen instrument status indicators: FLOW, LASER and FILTER
+ Filter service indicator for user preventative maintenance

Desktop Models (8530 and 8530EP)

+ Long life external pump (8530EP)
+ Internal pump (8530)
+ Hot swappable batteries
+ Gravimetric reference sample capability
+ STEL alarm setpoint

Optional Accessories

+ Auto zeroing module
+ Protective environmental enclosure (8535 and 8537)
+ Heated inlet sample conditioner (for use with an environmental enclosure)
+ Cloud Data Management System as hosted by Netronix™

Handheld Model (8532)

+ Long life internal pump
+ Single-point data collection for walk through surveys

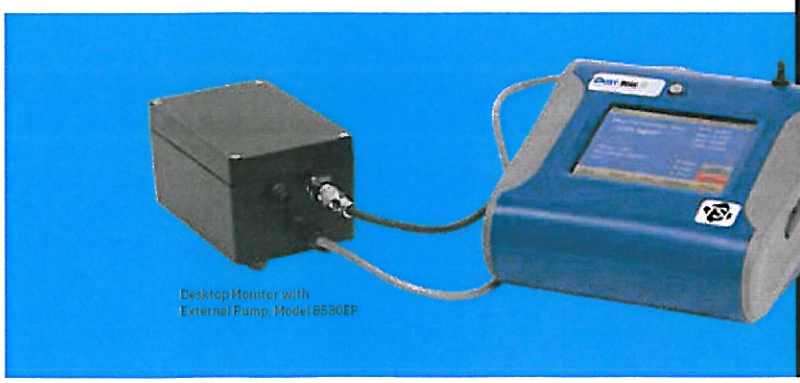
Easy to Program and Operate

The graphical user interface with color touch-screen puts everything at your fingertips. The easy-to-read display shows real-time mass concentration and graphical data, as well as other statistical information along with instrument pump, laser and flow status, and much more. Perform quick walk-through surveys or program the instrument's advanced logging modes for long-term sampling investigations. Program start times, total sampling times, logging intervals, alarm setpoints and many other parameters. You can even set up the instrument for continuous unattended operation.

TrakPro™ Software Makes Monitoring Easier than Ever

TrakPro™ Data Analysis Software allows you to set up and program directly from a PC. It even features the ability for remote programming and data acquisition from your PC via wireless communication options or over an Ethernet network. As always, you can print graphs, raw data tables, and statistical and comprehensive reports for record keeping purposes.





Desktop Monitor with External Pump, Model 8530EP

SPECIFICATIONS

DUSTTRAK™ II AEROSOL MONITORS MODELS 8530, 8530EP AND 8532

Sensor Type
90° light scattering

Particle Size Range
0.1 to 10 µm

Aerosol Concentration Range

8530 Desktop	0.001 to 400 mg/m³
8530EP Desktop with External Pump	0.001 to 400 mg/m³
8532 Handheld	0.001 to 150 mg/m³

Resolution
±0.1% of reading or 0.001 mg/m³, whichever is greater

Zero Stability
±0.002 mg/m³ per 24 hours at 10 sec time constant

Flow Rate
3.0 L/min set at factory, 1.40 to 3.0 L/min, user adjustable

Flow Accuracy
±5% of factory set point, internal flow controlled

Temperature Coefficient
+0.001 mg/m³ per °C

Operational Temp
32 to 120°F (0 to 50°C)

Storage Temp
-4 to 140°F (-20 to 60°C)

Operational Humidity
0 to 95% RH, non-condensing

Time Constant
User adjustable, 1 to 60 seconds

Data Logging
5 MB of on-board memory (>60,000 data points)
45 days at 1 minute logging interval

Log Interval
User adjustable, 1 second to 1 hour

Physical Size (H x W x D)

Handheld	4.9 x 4.8 x 12.5 in. (12.5 x 12.1 x 31.6 cm)
Desktop	5.3 x 8.5 x 8.8 in. (13.5 x 21.6 x 22.4 cm)
External Pump	4.0 x 7.0 x 3.5 in. (10.0 x 18.0 x 9.0 cm)

Weight

Handheld	2.9 lb (1.3 kg), 3.3 lb (1.5 kg) with battery
Desktop	3.5 lb (1.6 kg), 4.5 lb (2.0 kg)-1 battery, 5.5 lb (2.5 kg)-2 batteries
External Pump	3.0 lb (1.4 kg)

Communications

8530	USB (host and device) and Ethernet. Stored data accessible using flash memory drive
8530EP	USB (host and device) and Ethernet. Stored data accessible using flash memory drive plus, cable assembly for external pump
8532	USB (Hose and device). Stored data accessible using flash memory drive

Power-AC
Switching AC power adapter with universal line cord included, 115-240 VAC

Analog Out

8530/8530EP	User selectable output, 0 to 5 V or 4 to 20 mA. User selectable scaling range

Alarm Out

8530/8530EP	Relay or audible buzzer Relay Non-latching MOSFET switch + User selectable set point + -5% deadband + Connector 4-pin, Mini-DIN connectors
8532	Audible buzzer

Screen

8530	5.7 in. VGA color touchscreen
8532	3.5 in. VGA color touchscreen

Gravimetric Sampling

8530/8530EP	Removable 37 mm cartridge (user supplied)

CE Rating

Immunity	EN61236-1:2006
Emissions	EN61236-1:2006

Specifications are subject to change without notice.

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