REMEDIAL DESIGN REPORT
FOR THE REMEDIAL ACTION AT THE EAST YARD
ASTORIA, NEW YORK

50% DESIGN SUBMITTAL

Prepared For:

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FEBRUARY 2015

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LIST OF ACRONYMS

ADT	Aquifer Drilling and Testing, Inc.
AECOM	AECOM Technology Corporation
ASTM	American Society for Testing and Materials
bgs	Below Ground Service
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
cm/sec	Centimeters per Second
CP	Comissioner Policy
CFR	Code of Federal Regulations
CQAPP	Construction Quality Assurance Project Plan
CRZ	Contamination Reduction Zone
CY	Cubic Yard
DER	Department of Environmental Resources
DGI	Diversified Geophysics, Inc.
DOB	Department of Buildings
DOT	Department of Transportation
ELAP	Environmental Laboratory Accreditation Program
EM	Electro-magnetic
ft	Feet / Foot
GPM	Gallons Per Minute
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
ICM	Interim Corrective Measures
mg/kg	Millograms per Kilogram
MGP	Manufactured Gas Plan
NAPL	Non Aqueous Phase Liquid
NRG	NRG Energy, Inc.
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Poly-Chlorinated Biphenysl
PID	Photo-Ionization Detector
PPE	Personal Protective Equipment

LIST OF ACRONYMS (CON'T)

PSI	Pounds Per Square Inch
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RDR	Remedial Design Report
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SCO	Soil Cleanup Objectives
SOP	Standard Operating Procedure
SPDES	State Pollution Discharge Elimination System
SPT	Standard Penetration Test
SVOC	Semi-Volatile Organic Compounds
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

This Draft Remedial Design Report (RDR), 50% submittal, has been developed for Consolidated Edison of New York, Inc. (Con Edison) to present the preliminary design of corrective measures that will address known PCB impacts to soil at the Astoria East Transformer Yard site (the Site). This RDR also includes non-remediation capital improvements at the Site. The Site is located in the Con Edison Astoria Facility, in Queens, New York (Astoria Facility). The Astoria Facility encompasses an area of more than 200 acres along the East River. The Site occupies an open area of approximately 430 feet (ft) by 570 ft that is currently covered with asphalt and concrete. The Site is currently used for the storage of new and "field returned" transformers, as well as miscellaneous electronic parts and cables.

The Interim Corrective Measures (ICM) to be implemented at the Site are detailed in an approved ICM Plan titled "Interim Corrective Measures Plan- Removal of PCB-impacted Soil within the East Yard Solid Waste Management Unit (SWMU)" (ICMWP). This document was prepared for Con Edison by AECOM and approved by the New York State Department of Environmental Conservation (NYSDEC) in November 2014. This document was developed based on analytical information collected during several phases of a remedial investigation at the Site. A summary of the historic investigation results is provided in the ICMWP and in Section 1.1 of this RDR. Pre-design activities implemented in developing this RDR are summarized in Section 2.

The corrective measures include the following components:

- Shallow excavation in specified PCB Excavation Areas to depths ranging from 3 ft to 10 ft below ground surface (bgs) to remove PCB impacted soils. The remedial excavation depths were determined during previous sampling events and were specified in the DEC-approved ICMWP.
- Verification sampling from the sidewalls and the bottom of PCB Excavation Areas to confirm that soils greater than 25 ppm PCB have been removed.
- Installation of a geotextile demarcation barrier along the bottom and sidewalls of the excavation to mark the extent and location of clean backfill.
- Restoration of PCB Excavation Areas and backfilling/compacting with fill material that complies with 6 NYCRR Part 375,6.8(b) for Restricted Residential Use Soil Cleanup Objectives.

In addition to the corrective measures identified above, this design report addresses non-remediation capital improvements that will occur concurrently with or immediately after the remediation work.

The non-remediation capital improvements include the following components:

- Improvements to the stormwater management system on the site to direct drainage flows from the Site to the existing Outfall B and Outfall G systems;
- The removal of the concrete and asphalt pavement across the entire Site in those areas not already removed as part of the PCB Excavation Areas and installation of new concrete pavement;

- The construction of a transformer wash down shelter with the installation of light, power and water to the shelter; and
- The installation of an automated blocking valve and oil sensing system as part of the stormwater management system improvements to bolster the oil spill prevention system.

A project schedule outlining the major construction milestones is included in Section 4.0.

Comments received from the NYSDEC and Con Edison on this RDR will be incorporated into a Draft 95% RDR, which will be submitted for additional comments and then finalized. The final design will be issued to the NYSDEC in a Final Remedial Design Report (100% design). Site stakeholders (operating groups actively working on the Site) will be contacted during the development of the remedial design for input on any operational or logistical issues in order to determine the need for measures to mitigate potential disruptions to their workflow in the undisturbed portions of the Site.

SECTION 1

INTRODUCTION

Parsons has prepared this 50% Remedial Design Report (RDR) on behalf of the Consolidated Edison, Inc. (Con Edison) for the remediation of PCB impacted soils in the Astoria East Transformer Yard (Site) located in the Con Edison Astoria Facility, in Queens, New York (Astoria Facility). This RDR provides guidelines to implement the remediation in accordance with the New York State Department of Environmental Conservation (NYSDEC) approved East Yard Interim Corrective Measures (Work Plan (AECOM, 2014) (ICMWP).

1.1 SITE HISTORY AND BACKGROUND

Con Edison's Astoria Facility is a more than 200-acre site located along the East River in Queens, NY. The Astoria Facility is zoned for manufacturing/industrial use and is surrounded by developed industrial and residential areas. Con Edison's Astoria Facility is bordered to the west by power plants owned by the New York Power Authority (NYPA) and US Power Generating Company (USPG), to the north predominantly by the East River, to the east predominantly by Luyster Creek, and to the south by 20th Avenue. The Astoria Facility has been owned by Con Edison or its predecessor companies since the late 1890s. From the early 1900s through 1999, the Astoria Facility was operated as a power- or gas-generating and distribution facility. The power plants on the property were sold off before or during 1999. In addition to sale of power plants now owned by NYPA and USPG facilities, the Astoria Gas Turbines were sold to NRG Energy.

The Site is located in the south-central portion of the Astoria Facility southeast of the Transformer Shop (Building 82) and consists of an open area approximately 430 ft by 570 ft in size (Refer to Drawing C-001). The Site is covered with asphalt, concrete, and gravel and has historically been used to store both new and used ("field returned") transformers, some of which were known to have contained PCBs. Additional material stored in the Site includes bushings, lightning arresters, switchgear, and other miscellaneous electronics parts and cables.

The Site is designated as a Solid Waste Unit (SWMU) in accordance with the on-going RCRA corrective action program being implemented at the Astoria Facility. Multiple rounds of investigations have been conducted at the Site since 1994 and are summarized in Section 1.1.1. Additional information on the Site can be found in the approved ICMWP.

1.1.1 Summary of Previous Remedial Investigations

The East Yard Remedial investigation work began in 1994 and was completed in 2013, with the final ICM Work Plan (ICMWP) submitted to the DEC and approved in 2014 (AECOM, 2014). Several phases have been conducted during this time to refine the nature and extent of environmental impacts in the yard. A summary of these phases is below:

- ***Screening RFI Investigation of the East Yard:*** The East Yard was first investigated in 1994 during the Astoria site wide RCRA Facility Assessment. During this investigation, 30 soil samples were collected from various locations and depths and analyzed for

VOCs, SVOCs, PCBs, lead, chromium, and mercury. Additionally, PCB field screening was conducted in shallow soils using immunoassay field screening kits.

- ***2001 PCB Investigation:*** In 2002 it was determined that additional sampling was needed to delineate the extent of PCB impacts in the vicinity of E05 and E15 (in the south central and northeastern portion of the yard). Eleven (11) new borings were advanced and additional samples were taken from 1 to 2 ft and 5 to 6 ft for PCB analysis. Soil samples from three borings were also analyzed for VOCs and PAHs, and one sample was submitted for TPH fingerprinting. Groundwater samples were taken from well N08 and analyzed for PCBs, VOCs, and SVOCs to evaluate groundwater quality.
- ***2012 and 2013 PCB Investigation:*** In 2012 and 2013, a PCB investigation was conducted to delineate PCBs in the East Yard to 25 ppm. During several rounds of iterative sampling, PCB impacts were horizontally and vertically delineated at the site. Additionally, in borings where visual/olfactory impacts were observed, samples were collected for VOCs, SVOCs, and/or cyanide.
- ***2012 and 2013 MGP Investigation:*** In 2012 and 2013, a total of three new borings were advanced into the top 5 ft of bedrock in the East Yard to evaluate potential MGP impacts. Borings E44, E45, E60, E65, E72, E80 and E91 were over drilled to deeper depths (between 25 ft bgs and 5 ft into bedrock) using sonic drilling methods. These borings were advanced to evaluate the extent of PAH concentrations detected in this area of the East Yard. Boring E44A was drilled adjacent to boring E44 to further evaluate PAH and visible impacts at that location. Soil samples were collected from each location (provided on the boring logs).

Historic soil boring logs and monitoring well logs, and soil and groundwater analytical results are included in the East Yard ICMWP in Appendix L. Historic boring locations are shown on Drawing C-011.

1.1.2 Summary of Interim Corrective Measures Work Plan

This section presents a brief summary of the DEC-approved ICMWP, which includes planned methods and procedures for the remediation of the Site. These activities will be conducted in a manner generally consistent with the RCRA Corrective Action Program and previous field activities. The ICMWP included the following:

PCB impacted soils: PCB-impacted soil (>25 ppm PCBs) will be excavated from 12 PCB Excavation Areas along with the overlying concrete and pavement in these areas and will be disposed of off site. Post excavation samples will be taken from the side walls and bottom of the PCB Excavation Areas to confirm that impacted soils have been removed. A demarcation barrier will be placed along the bottom and sidewalls of the PCB Excavation Areas to indicate the boundary of clean backfill. The PCB Excavation Areas will be backfilled with fill that complies with 6 NYCRR Part 375,6.8,(b) for Residential Restricted Use Soil Cleanup Standards and repaved with concrete. An estimated 7,900 cubic yards (CY) of soil, asphalt and concrete (assuming vertical sidewalls) will be removed from the 12 PCB Excavation Areas as shown on Drawing C-006.

PAH and metal impacted soil: The entire Site will be repaved with new concrete pavement, which will minimize the mobilization of contaminants through wind or water erosion, and eliminate the potential for direct contact with exposed soil.

MGP impacted soils: Will be addressed at a later date as part of the Astoria Facility-wide MGP remediation.

1.2 REMEDIAL ACTION OBJECTIVES

The remedial action objectives for the Site, as defined in the ICMWP , are as follows:

- To reduce levels of PCBs to below NYSDEC's Industrial Use Soil Cleanup Objectives (SCOs); and
- To minimize mobilization and eliminate contact with PAH and metal impacted soil.

While MGP impacted soil was also encountered in the eastern corner of the Site, the MGP impacted soils will be addressed as part of the Astoria Facility-wide MGP remediation that will be performed at a later date. This document focuses on the remediation of the PCB impacted soils at the Site.

1.3 REMEDIAL DESIGN REPORT ORGANIZATION

This RDR is organized as follows:

- Section 1.0 – INTRODUCTION: This section provides a brief description of the location of the Site, the historical operations performed on the Site, a summary of the approved ICMWP, and the remediation and construction action/design objectives for the proposed activities.
- Section 2.0 – PRE-REMEDIAL DESIGN ACTIVITIES: This section summarizes the activities implemented prior to design to gather information supporting the design of the remediation and construction efforts.
- Section 3.0 – REMEDIAL DESIGN ELEMENTS AND ACTIVITIES: This section details the current preliminary design for both the remediation and construction activities to take place at the site.
- Section 4.0 – DESIGN AND CONSTRUCTION SCHEDULE: This section presents project milestones and a corresponding schedule.
- Section 5.0 – PERMITS REQUIRED FOR CONSTRUCTION AND REMEDIATION: This section summarizes permits that will be necessary for the implementation of the proposed activities.
- Section 6.0 – PROJECT IMPLEMENTATION / REMEDIAL CONTRACTOR SELECTION: This section provides information on how a remedial contractor(s) will be selected to implement the proposed construction and remediation activities.
- Section 7.0 – REFERENCES: This section provides a listing of the references used to develop this RDR.

SECTION 2

PRE-REMEDIAL DESIGN ACTIVITIES

Prior to beginning the remedial design, several field tasks were performed in order to obtain additional information to support the remedial design and design of the concrete pavement and stormwater management system. These efforts were conducted by Parsons in October 2014 and included the following tasks:

- A subsurface utility survey using ground penetrating radar (GPR) to confirm the location of utilities by record and attempt to identify potential unknown utilities at the Site. The survey was conducted to assist in design and placement of the stormwater management system structures at the Site;
- A detailed Site survey to verify and document existing physical features at the Site and to verify existing Site topography;
- A limited geotechnical investigation to collect blow count information that will support design of the concrete pavement system;
- Slug testing to determine approximate hydraulic conductivities of the fill material that will typically be encountered at the Site for dewatering purposes; and
- Several meetings were conducted with Site stakeholders (including the Con Edison Transformer Shop, Facilities Engineering, and Stores operations groups) to better understand the needs of each group while planning the phasing of the remedial activities and logistical issues at the Site.

A summary of the results of these pre-design activities are included in this RDR. The following sections provide detail on the objectives and implementation results of the above pre-design activities.

2.1 SUBSURFACE UTILITY SURVEY/DRAINAGE REVIEW

A subsurface utility survey was conducted across the Site using GPR to identify and confirm the location of utilities at the Site. This section provides additional information on the survey and results.

2.1.1 Purpose of Utility Survey/Drainage Review

The purpose of the GPR survey was to confirm the location of known existing utilities and to identify the location of potential unknown subsurface obstructions in the Site that could impact design, remediation and construction efforts across the Site.

It was necessary to identify utilities and other subsurface obstructions prior to proceeding with the design so that the placement of structures in design did not interfere with existing utilities. Additionally, the GPR survey assisted in the identification of subsurface structures that could potentially impact remedial excavation and construction efforts. Survey efforts were conducted by Diversified Geophysics, Inc. (DGI).

In addition, the existing drainage in close proximity to the Site was inspected and surveyed (for invert elevations) to better understand the tie-in points for stormwater design and installations.

2.1.2 Survey/Drainage Review Activities and Results

Before mobilizing to the Site to conduct the utility survey, a review of Site utility drawings (prepared by Pope and Evans) was conducted. This included water, gas, electrical, concrete construction, and sewer lines. These utility drawings dated back to prior to 1980. The drawings were reviewed by Parsons and the utility survey contractor (DGI) prior to starting field work. During field work, known utilities were field verified.

The utility survey was conducted utilizing GPR, electro-magnetic pipe (EM), cable and box locators and visual inspection. Multiple instruments were used in an effort to better refine the survey and to ensure the field verification/location of as many utilities as was possible (with minimal error).

Chazen Engineering & Land Surveying Co., P.C. (Chazen) was contracted to survey existing surface features and topography in the Site. Additionally, Chazen surveyed in the marked out utilities that were identified during GPR and utility surveys.

During the utility survey, most of the utilities were field verified and a number of anomalies were identified across the Site. These locations were marked in the field with details that included the source and approximate depth of the utilities. A summary of this utility survey is depicted in Drawings C-001 and C-002 of this RDR.

2.2 GEOTECHNICAL INVESTIGATION

The following sections provide a summary of the limited geotechnical investigation that was performed at the Site. This investigation included advancing four soil borings to 11 ft bgs with a hollow-stem auger rig, in each of the four corners of the Site. Additionally, two locations were cored to approximately 1 ft bgs in the middle and southern end of the Site to verify the thickness of the concrete at different points on the Site. The locations of these borings are shown on Design Drawing C-001.

2.2.1 Purpose of Investigation

The objective of the geotechnical investigation was to indirectly measure the strength of the existing soil and fill material at the Site to support the design of the concrete pavement. This data was collected using a Standard Penetration Test (SPT) to collect blow count numbers while advancing a Hollow Stem Auger at the Site. During auger advancement, the number of blows required to advance the auger 6-inch diameter into the fill was counted every 2 ft and documented. This information, along with the properties of the fill material encountered, was recorded on boring logs (provided in Appendix N). This information will be used when designing the overlying concrete (and potentially in determining the thickness of a sub-base layer to support the concrete pavement).

2.2.2 Geotechnical Investigation Activities and Results

The soil borings were advanced by a licensed drilling subcontractor, Aquifer Drilling and Testing, Inc. (ADT), contracted by Parsons for this investigation. Prior to drilling, ADT pre-

cleared each of the boring locations to 5 ft bgs using hand tools and a portable drum-vac tool. Once pre-clearing was completed, ADT utilized a hollow stem auger rig to advance the soil borings and collect soil quality and blow count information. All four of the boring locations (E102 through E105) were advanced to a depth of 11 ft. Asphalt and concrete removed during pre-clearance and all excess soil cuttings generated during pre-clearing and drilling activities were containerized into properly labeled 55-gallon drums for off-site disposal. Soil boring logs are included in Appendix L.

The SPT measurements were conducted in accordance with American Society of Testing and Materials (ASTM) standard test method D1586. Soils were screened with a Photo-Ionization Detector (PID) and were logged with descriptions made in accordance with the Bermister visual-manual techniques.

Generally, the subsurface conditions encountered during the drilling and sampling consisted of fine to coarse sands, intermixed with small to medium gravels, as well as some brick/debris. These observations are consistent with the historic observations made at the Site. Some light impacts/odors were encountered in the northeast and northwest corners of the Site at intermittent depths ranging from 2 to 10 ft bgs.

SPT results ranged from 1 to 42 blows per 6-ft interval, corresponding to SPT N-values ranging from 4 to 70. Generally, lower numbers were obtained from borings advanced in the north end of the Site indicating that soils in that area were less dense than the soils in the southern part of the Site. The concrete thickness and strength has been designed conservatively based on the lower SPT results to establish adequate strength in areas with less dense soils/lower support.

In addition to the SPT borings, cores were taken from existing concrete in the middle and south end of the Site to verify the thickness of existing concrete. CD-01 was advanced adjacent to the retaining wall that runs along the roadway to the south of the Site. C-01R was advanced across the retaining wall along the roadway, within the material storage row. CD-02 was advanced to the west of the loading dock crane platform in the middle of the Site on its eastern boundary. The thickness of the concrete was observed to be 5.5 inches (at CD-02) and 6.75 inches (at CD-01R). No concrete was present at CD-01, which was advanced in the roadway south of the curb/retaining wall. The core drill locations are shown Design Drawing C-001.

Groundwater:

The depth to groundwater was measured during drilling and soil testing activities. The depth to groundwater ranged from 9.5 ft to 10 ft in the borings installed during the October 2014 sampling event. These levels are consistent with the groundwater levels historically observed at the Site as presented in the ICMWP but are expected to fluctuate seasonally.

2.3 HYDRAULIC CONDUCTIVITY TESTING

The following sections summarize the activities and results of hydraulic conductivity testing (slug testing) that was performed at five well locations in and near the Site. The slug tests included conducting rising head tests in 1.5-inch and 2-inch diameter shallow wells (screened in the fill layer) and measuring recharge rates to estimate the local hydraulic conductivity of the

Site fill materials. Slug testing was done during two events on October 21st and November 7th, 2014.

2.3.1 Purpose of Testing

The objective of the slug tests conducted in and around the Site was to obtain an approximate measurement of the hydraulic conductivity of the material at the Site. This estimate would be provided to remediation contractors (in the bid package) for use in dewatering estimates/sizing the groundwater treatment system during construction efforts.

2.3.2 Summary of Testing Activities and results

A detailed summary of slug testing activities and the results is provided in the Slug Testing Memo, provided in Attachment K. The results of the slug tests from wells F88, MGP121S, and N02 provide a relatively narrow range of hydraulic conductivities, shown in Table 1.1, below.

Table 1.1: East Yard Hydraulic Conductivity Results

Well ID	Comments	Screen Interval (ft bgs)	Soil Description	Test Method	Slug Test Date	Hydraulic Conductivity	
						(cm/sec)	(ft/day)
F-88	East Yard Area of Interest	10 - 20	Brown, fine to coarse sand, some gravel	Rising Head	11/7/2014	1.01E-03	2.86
					11/7/2014	7.75E-04	2.20
Average for F-88						8.93E-04	2.53
N-02	East Yard Area of Interest	9 - 14	Brown, fine to medium SAND, some Silt	Rising Head	11/7/2014	2.39E-03	6.77
					11/7/2014	1.91E-03	5.41
					11/7/2014	1.72E-03	4.88
Average for N-02						2.01E-03	5.69
MGP-121S	Outside of East Yard	9 - 19	Orange-brown coarse to fine sand, some cobbles, little subrounded gravel	Rising Head	11/7/2014	8.02E-03	22.73
					11/7/2014	8.00E-03	22.68
					11/7/2014	9.61E-03	27.24
					10/21/2014	9.55E-03	27.07
Average for MGP-121S						8.80E-03	24.93
Geometric Mean of All Wells						**2.51E-03**	**7.11**

Notes: 1) ft bgs = feet below ground surface

2) In cases where sand pack drainage appeared to affect the beginning of the test the initial measurements were ignored.

2.4 COORDINATION WITH SITE STAKEHOLDERS

Con Edison, in conjunction with Parsons, is currently working with the relevant Site stakeholders regarding the proposed remedial design and construction activities at the Site. Con Edison has facilitated meetings with key site stakeholders to evaluate Site design and construction needs and to better understand logistical issues that will impact project sequencing and phasing. This is being done to minimize impacts to Site stakeholders and to obtain input on the optimal drainage and concrete design to meet operational and storage needs at the Site.

SECTION 3

REMEDIAL DESIGN ELEMENTS AND ACTIVITIES

This section details the implementation of the remediation and construction activities that will be performed at the Site. The anticipated methods and sequencing of the work are presented to ensure an understanding of how the remedial goals will be met.

3.1 SITE PREPARATION

3.1.1 Soil Erosion and Sediment Control

Prior to beginning intrusive activities, soil erosion control and sediment controls will be installed and maintained by the remedial contractor. Drawing D-001 provides detail relating to the soil erosion and sediment control measures that will be installed and maintained during the implementation of remediation and construction activities. Additional detail will be provided in the 95% RDR submittal. These measures will include silt fencing to minimize soil or sediment erosion from the Site, hay bales to berm off drainage and route stormwater from upgradient locations away from excavations with PCB-contaminated soil and sediment. These structures will be inspected and maintained throughout the project and will not be removed until after project completion and permanent stabilization (i.e., pavement, vegetation, etc.) has been established. During nonworking hours and periods of precipitation, stockpiled materials will be covered with impermeable sheeting or tarps to minimize contact with stormwater.

The remedial contractor will be required to meet the requirements set forth in remedial design specifications and drawings. Additionally, a Stormwater Pollution Prevention Plan (SWPPP) will be provided in the 95% RDR submittal. This document will provide detail on the controls utilized and frequency of inspection/reporting during intrusive activities. Prior to the start of construction activities, Con Edison will apply for a SPDES Construction Activities General Permit.

3.1.2 Temporary Site Facilities

The selected remedial contractor will be responsible for providing all temporary facilities that are needed for remediation and construction activities. This includes (but may not be limited to) office trailers and utilities, equipment and material staging, an exclusion zone and decontamination area, and required ingress/egress to the Site.

The selected remedial contractor will either use the existing utilities on the Site or will arrange for providing temporary utilities if not already available. This includes electricity, telephone, water supplies and sanitary facilities.

3.1.2.1 Office Trailers

The selected remedial contractor will be responsible for mobilizing office trailers to the Site to be utilized during the remediation and construction activities. The proposed locations of these trailers will be detailed in the 95% RDR. These trailers will be equipped with appropriate office materials and furniture and will be powered with temporary electrical services that will be connected from local existing electrical services on-site.

3.1.2.2 Equipment Staging Areas

Temporary equipment staging areas will be established by the selected remedial contractor in areas designated by Con Edison. These areas will be identified in the 95% RDR. These areas will be selected and located to minimize disturbance to existing Site operations. The staging areas will be located to allow for equipment ingress and egress and will take into consideration the sequencing of the remedial construction activities. The remedial contractor will mobilize all equipment needed to implement the remediation and construction activities on-site.

Throughout the project, equipment staging areas will move during different excavation phases to minimize disruption to existing Site operations and to allow for the effective utilization of open areas at the Site. The proposed locations of the equipment and staging areas will be shown on the construction layout and staging plan drawings to be provided with the 95% RDR. The proposed locations of the equipment staging areas will be detailed in the 95% RDR submittal.

3.1.2.3 Material Management and Temporary Staging Areas

Because of space constraints at the Site, it is anticipated that, to the extent possible, soils and other excavated materials from the PCB Excavation Areas will be directly loaded ("load and go") for transport to a Con Edison approved offsite disposal facility. Waste characterization samples will be taken by the remedial contractor as needed to establish appropriate waste profiles in accordance with the acceptance criteria of the Con Edison approved disposal facility and to arrange for Con Edison approved transporters. Samples will be taken prior to the removal of soils, to allow for waste characterization of soils before loading. The remedial contractor will be responsible for selecting a Con Edison approved disposal facility and transporter and complying with all waste characterization requirements of the disposal facility. Before leaving the Site, tarps will be placed over the truck beds and the tires and bottom of the truck will be decontaminated.

In addition to soils and materials removed from the PCB Excavation Areas, the remedial contractor is responsible for the excavation and backfill required to complete the capital improvements, as well as, demolition at the Site. The remedial contractor is responsible for properly managing the various material categories to avoid commingling, as described below.

- Demolition of existing structures and foundations will be performed in accordance with Con Edison specification CE-ES-3400, Part 2060, *Demolition*. Demolition debris will be separated, transported by Con Edison approved transporters, and disposed of at a Con Edison approved recycling/processing facility.
- Concrete and asphalt removed from areas outside of PCB Excavation Areas will be handled as Construction and Demolition debris, transported by Con Edison approved transporters, and disposed of at a Con Edison approved recycling/processing facility.
- Soils and materials excavated in areas outside of PCB Excavation Areas, will be reused as backfill to the extent possible, in accordance with Con Edison specifications, CE-SS-3400, Part 2200, *Excavation and Backfill*; GEHSI 05.13, *General Environmental, Health and Safety Instruction E05.13*. These excavated soils will not be used for backfill in the PCB Excavation Areas. The above referenced Con Edison specifications require that soil excavated from below 2 ft bgs remain segregated from

soil excavated from above 2 ft bgs. Soil excavated from below 2 ft bgs may be used as backfill at depths greater than 2 ft bgs, provided does not exhibit contamination based on visual or olfactory observations. Likewise, soil excavated from above 2 ft bgs may be used as backfill at depths less than 2 ft bgs, provided it does not exhibit contamination based on visual or olfactory observations. Surplus excavated soil from either depth interval must be managed, characterized, labeled, stored and disposed of properly.

The remedial contractor will be required to submit a Materials Management Plan for review and approval by Con Edison prior to commencing work at the Site.

3.1.2.4 Decontamination Area

During all remediation and construction activities, the Site will be divided into three zones: exclusion zone, contamination reduction zone, and support zone. These locations will change throughout the phases of the remediation activities as areas are restored/new excavation areas are established. Temporary fencing and/or barriers will be used to delineate the area exclusion zone and contamination reduction zones and to restrict access to the work area, as needed. The decontamination area will be within the contamination reduction zone and will include the personnel decontamination area and equipment decontamination pads.

3.1.2.5 Ingress/Egress

The ingress and egress points will change during the remediation activities as phases are started and completed. Primary ingress and egress to the Site will most likely be from the roadway running along the western edge of the Site. Should additional ingress and egress points be required, discussions will be held with Con Edison's Construction Group and operating groups on the Site to ensure the access will not impede/impact existing Site operations during remediation/construction. To the extent possible, these approvals will be obtained by the selected remedial contractor prior to mobilization to the Site. All work will be performed in accordance with the Site Security Plan, which will be provided with the 95% RDR.

3.1.3 Existing Monitoring Wells

Two existing monitoring wells (F-88 and N-02) are present at the Site and both are within excavation areas (Area 10 and Area 2, respectively). These wells will be decommissioned by the remedial contractor prior to excavating these two areas. The wells will be decommissioned by a New York State certified licensed well driller. Well decommissioning will be done in accordance with the New York State Department of Environmental Conservation (NYSDEC) CP-43; *Groundwater Monitoring Well Decommissioning Policy*.

3.1.4 Demolition and Above Ground Structures

There are several aboveground structures currently on the Site. These structures are depicted on Drawing C-002. The following approach will be used for each structure:

<u>Cable Yard Building:</u>

- Building and access to remain in service during and after construction activities.
- Earth support will be required on north side of the building.

Building 82 ½:

- Building to be removed and replaced with new building in Row F1. Operations in the existing Building 82 ½ will remain active until the proposed Building 82 ½ is operational.

Shed (adjacent to Bldg. 82 ½):

- Shed to be removed and replaced in Row F1.

Canopy Area (Row E):

- Proposed Canopy Area to be constructed in Row F1 to replace the existing Canopy Area.
- Existing Canopy Area structure to be disassembled and re-assembled on new footings in Row F1.
- Canopy Area activities will take place in proposed Transformer Wash Down Shelter while proposed Canopy Area is being completed.

Overhead Crane:

- Overhead crane and concrete slab to remain.
- Overhead crane to remain in use during construction activities.

One Story Block Building:

- Building to be demolished and not replaced.

One Story Metal Building:

- Building to be demolished and not replaced.

Water Meter Structure:

- Water meter structure and valve pit to remain in service during remedial activities.

Additional detail on the demolition and replacement of aboveground structures, including consideration for waste profiling and demolition debris handling at the Site will be provided in the 95% RDR submittal.

Building foundations and similar structures will be demolished in accordance with the Con Edison standard CE-ES-3400, Part 2060, Demolition. The demolition debris will separated for transport to appropriate recycling/processing facilities.

3.2 EXCAVATION PLANS

Remedial excavations are planned in the PCB Excavation Areas identified in the approved ICMWP. In addition to the PCB Excavation Areas, non-remedial excavation will occur to allow for the installation of the capital improvements. The anticipated volume of soil, asphalt, and concrete that will be generated during remedial excavation and capital improvement activities is summarized in Table 3-1, below:

Table 3.1: Estimated Excavation Volumes

PCB Excavation Areas (assuming vertical sides)		
Concrete, Asphalt, Soil and Materials	7,900	CY
Concrete and Asphalt outside PCB Excavation Areas		
Concrete and Asphalt	6,950	CY
Soil Outside PCB Excavation Areas		
Soil (Estimated)	5000	CY

3.2.1 Excavation Areas

3.2.1.1 Remedial Excavation Areas

Excavation of PCB impacted soil will occur in the 12 PCB Excavation Areas identified in the ICMWP and shown on Drawing C-006 to depths ranging from 3 to 10 ft bgs. The concrete and asphalt within the PCB Excavation Areas will be disposed of along with the soil. The majority of these PCB Excavation Areas are within the unsaturated zone but deeper excavations will likely extend into the saturated zone since the water table has historically ranged from 8 to 10 ft bgs at the Site. The PCB Excavation Areas are delineated based on a soil cleanup objective of 25 ppm for PCBs. Confirmatory samples will be taken from the sidewalls and bottom of the excavation to confirm the soil clean up objective has been met, as described in Section 3.2.5. If the sample indicates the soil cleanup objective has been exceeded, additional excavation will occur, and will be followed by another round of confirmatory samples. Remedial excavations will not extend past the limits of work identified on Drawing C-009. If visual impacts or confirmatory sampling indicates that contamination extends past the boundaries of the Site, the observations/analytical results will be documented and addressed at a later time during subsequent phases of investigations and remedial actions at the Astoria Facility.

Once confirmatory samples indicate the soil clean up objective has been met, a demarcation layer will be installed and the PCB Excavation Area can be backfilled and compacted with material that complies with 6 NYCRR Part 375-6.8(b) Restricted Residential Use soil cleanup objectives, with the upper 6 inches of material being structural fill to support the concrete pavement, as described in Section 3.4.

3.2.1.2 Excavation for Structural Fill and Stormwater Management System

Existing concrete and asphalt will be removed from the remaining areas of the Site that are outside of the PCB Excavation Areas to allow for the installation of the capital improvements. Concrete and asphalt in these areas will be disposed of as Construction and Demolition debris at a Con Edison approved recycling/processing facility, and in accordance with Con Edison specification, CE-ES-3203, *Removal and Disposal of Construction and Demolition Debris*.

Soils outside of PCB Excavation Areas will be removed from these areas as well, as needed to allow for a minimum of 6 inches of structural fill to be placed under the proposed concrete pavement. In isolated areas, deeper depth excavations are required to construct foundations for proposed or relocated structures. Excavated soil will be reused as backfill to the extent practicable; as a result the remedial contractor will segregate soil as discussed above in Section 3.1.2.3 above. Additional detail on the soil removal for sub-base and foundations will be provided in the 95% RDR submittal.

In addition to the above soil removal for sub-base and foundations, deeper excavations will be required for the installation of the stormwater management system. As described above the Con Edison standards related to use of excavated soil as backfill will apply to the installation of the stormwater management system. To the extent possible, proposed stormwater structures have been designed to overlap with PCB Excavation Areas, to minimize additional excavation needs. Piping and stormwater management system structures will be sized to handle stormwater flows as outlined in Section 3.3. Additional detail on the stormwater system placement depths and excavation volumes will be provided in the 95% RDR submittal.

3.2.2 Excavation Approach

Additional detail on the excavation approach and sequencing, along with methods for removing and replacing some features at the Site will be detailed in the 95% RDR submittal. The approach described in this RDR is the anticipated approach to be implemented by the selected remedial contractor.

The anticipated excavation approach will likely follow the construction phases beginning with the first phase at the north of the Site and will continue south to the south end of the Site, as discussed in Section 3.2.2.1.

3.2.2.1 Sequencing and Phasing of Excavation Areas

Due to operational and storage needs at the Astoria Facility, parts of the Site will need to remain fully operational throughout the construction activities. To allow for the continued storage of transformers and materials, excavation and construction activities will be phased and will generally proceed from the north end of the Site to the southern end of the Site. At this time, it is anticipated that seven phases of work will be implemented at the Site, as shown on Drawing C-009. However, the anticipated sequencing of the remedial activities may be modified by the selected remedial contractor as approved by Con Edison.

During each phase of the construction activities, access to operationally critical structures on the Site will be maintained. This includes the Cable Yard Building at the west end of the Site, as well as part of the loading dock that runs along the western edge of the Site. All of the material storage rows that are actively being used will be left open (on at least one side) and will be kept free of obstructions (including equipment and materials). Additionally, the overhead covered crane that extends out from the loading dock area will be kept operational and accessible.

Con Edison will provide sufficient storage on the Site to allow for at least two phases to proceed simultaneously during construction efforts. This will allow for construction and excavation work to proceed in a new area while the previous phase completes its cure.

Excavation activities will be planned so that materials, equipment, and vehicles can access the area with minimal disruption to existing operations at the Site. This includes avoiding

excessive traffic or staging in the roadways to the south and east of the Site, which are critical transformer loading and offloading routes to the Site.

3.2.3 Sheeting and Shoring

The selected remedial contractor will conduct the remedial action and capital improvements in accordance with the OSHA requirements in 40 CFR 1926. All earth support systems for the excavations will be designed and sealed by a Professional Engineer licensed in the State of New York. Earth support system designs will be reviewed by Con Edison or their representative and must be in accordance with Con Edison standards. In addition, the earth support system designs will be reviewed by Parsons for compliance to the requirements of the design drawings and technical specifications.

Trench boxes and trench shoring performed to allow the installation of the stormwater devices must be done in accordance with OSHA standards. The remedial contractor will propose appropriate sheeting and shoring methods and designs to allow for the installation of the stormwater drainage system.

Drawings depicting the minimum locations where an earth support system is necessary to support the existing grades, structures and roadways, as well as additional earth support detail, will be provided in the 95% RDR submittal.

3.2.4 On-Site Utilities

Active and inactive utilities exist on-site, and will be encountered during excavation activities. The selected remedial contractor will locate and identify underground utilities that will be encountered during excavation activities. To prepare for this, the remedial contractor will contact Dig Safely New York to locate and mark out the utilities. Additionally, the remedial contractor will review the existing utility plates and drawings, to be provided by Con Edison in the bid package. Con Edison will also provide field utility location services and mark out utilities at the Site. All excavation and coordination with respect to locating and protecting underground utilities will proceed in accordance with Con Edison standards. Con Edison Construction Management will provide key input on the extent of utility clearance needed around the perimeter of the East Yard and at specific excavation areas.

The remedial contractor will be responsible for ensuring that the integrity of exposed utilities or structures is maintained during excavation activities, by protecting the utilities and/or maintaining structural supports. The means and methods for protecting and/or supporting utilities will be provided in the remedial contractor's approved Work Plan submittal. More detail on the submittals required by the remedial contractor will be included in the 95% design submittal. If it is not feasible to extend remedial excavations around or below the structures, the excavation may be stopped at, or near the structure, to prevent damaging or undermining the utility/structure. If this is determined necessary, the NYSDEC will be notified and approval will be obtained before proceeding.

Several active aboveground utilities including overhead electric and lighting are present at the Site. The remedial contractor will be responsible for maintaining and supporting the lighting and electric during construction activities. The means and methods for protecting and supporting these utilities will be provided in the remedial contractor's approved Work Plan

3.2.5 Confirmatory Sampling

Following excavation of the PCB Excavation Areas, confirmatory soil samples will be collected from the bottom and side wall of the excavations in accordance with the Construction Quality Assurance Project Plan (CQAPP), included as Appendix G. For excavation areas with less than 20 linear ft of perimeter, one bottom sample will be collected, as well as one sidewall sample biased towards the down gradient side of the excavation. For all areas greater than or equal to 20 linear ft of perimeter, one sample will be collected from the bottom of each sidewall for every linear 30 ft of sidewall, and one bottom sample will be collected every 625 square ft, as outlined in the CQAPP. However, this frequency may be adjusted during the remedial excavations depending on the configuration of the earth support systems and existing Site logistics. Samples will be analyzed for PCBs to verify that a soil cleanup objective of 25 ppm PCBs has been achieved. If analytical results for any of the bottom or sidewall samples exceed this soil cleanup objective, the excavation will be extended horizontally or vertically within the limits of work for the Site as defined in drawing C-009 to remove the impacted material. Where adjacent structures or utilities make it difficult or impossible to extend the excavation the limits the NYSDEC will be notified and further action will be discussed/ coordinated with NYSDEC.

In areas where sheeting and shoring makes the collection of sidewall samples impractical, the soil samples will be collected from within the excavation during excavation efforts, as close as possible to the edge of the sheeting, for documentation purposes. In areas where earth support systems are required, no expansion excavation is planned behind earth support systems.

3.2.6 Dust and Odor Control

On-site soils are impacted with PCBs and, in limited areas, with PAHs from historic MGP operations. To address these impacts and to mitigate air emissions during construction activities, continuous monitoring of dust and VOCs will be conducted at the Site during intrusive construction activities. Additionally, dust suppression techniques will be used to control and reduce dust emissions when levels exceed 100 µg/m3 over upwind levels or when visual dust migration is observed. A surrogate PCB monitoring method has been developed, by which dust monitoring will be used to address air quality concerns relative to PCB impacted soils, as outlined in the East Yard Community Air Monitoring Plan (CAMP) included as Appendix D.

If nuisance odors are identified at the Site boundary or if odor control complaints relating to the work are received, specific control measures will be implemented to mitigate the odors. These measures include (but are not limited to) limiting the area of open excavations and size of soil stockpiles, covering the source of the odor and/or the application of foam at the source of the odor.

During all intrusive activities, air quality monitoring will be conducted on the upwind and downwind perimeters of the site to ensure that the remediation and construction activities are not adversely impacting the air quality of the surrounding community. Community air monitoring will be conducted in accordance with the Site specific Community Air Monitoring Plan (CAMP) included as Appendix D.

3.2.7 Decontamination of Equipment and Personnel

As previously stated in this RDR (Section 3.1.2.4 Decontamination Area), during remediation and construction activities, the work area will be divided into three zones: the exclusion zone, the contamination reduction zone, and the support zone.

Equipment Decontamination

Equipment decontamination at the Site will be performed in accordance with the approved ICMWP. All equipment, tools, other materials which have contacted impacted soil at the Site will be decontaminated prior to leaving the construction work area. Additional detail on decontamination requirements will be presented in the 95% RDR submittal.

The selected remedial contractor will construct a decontamination pad consisting of crushed stone, and an impervious liner prior to the start of work. At a minimum, the decontamination pad will meet the following requirements:

- The area facilitating the decontamination pad(s) will be modified as needed to accommodate the pad(s);
- The pad area will be lined with two layers of 40 millimeter high-density polyethylene (HDPE) sheeting (thick enough to withstand daily use) and woven geotextile and covered with crushed stone in a manner that allows rinsate water to freely drain and collect in a sump for removal and disposal;
- The pad area(s) will be graded for easy entrance and exit to vehicles and equipment;
- The pad(s) will be able to hold a minimum of 4 inches of standing water at the shallowest point within the containment. It shall be sized sufficiently to prevent splashing and spraying from decontamination activities from contacting the surrounding unprotected surfaces;
- The pad shall be kept empty and protected from rainwater when not in use; and
- The pad shall be maintained throughout the duration of the project.

In the decontamination area, the selected remedial contractor will remove soil, debris, and other miscellaneous materials from the undercarriages and wheels of all construction equipment and tools used by means of a high-pressure, low volume steam cleaner. Physical/mechanical agitation of soil may be also be used to minimize the generation of wastewater.

The remedial contractor will pump all rinse water generated during the decontamination process out of the decontamination pad sump; this water will be stored in temporary storage containers, either for on site treatment and discharge or for off-site disposal at a Con Edison approved disposal facility.

All decontamination wastes, personal protective equipment (PPE), and polyethylene materials that come in contact with PCB-impacted soil will be disposed of as PCB remediation wastes. Wastes will be segregated by their matrix and disposed of appropriately. The remedial contractor will be required to submit a Waste Management Plan to Con Edison for approval prior to commencing excavation activities. Additional detail on the required Waste Management Plan will be included in the 95% RDR submittal.

Personnel Decontamination

Field decontamination and cleanup of personnel will take place in established contamination reduction zones (CRZs). To the extent feasible, these field decontamination facilities will be located upwind of the exclusion zone.

All used disposable PPE will be collected at the decontamination site and placed in a secured, labeled drum. These materials will be disposed of appropriately at a Con Edison approved disposal facility. Additional details for personnel decontamination are presented in the Health and Safety Plan contained in Appendix L

3.3 STORMWATER MANAGEMENT SYSTEM INSTALLATION

Under current conditions, the Site conveys flow overland to Outfall B and Outfall G. Stormwater flow is also directed to a trench drain along the north end of the Site which discharges flow through a 15-inch stormwater pipe to Manhole #6 at the upgradient end of Outfall G.

The design for the Site stormwater system discharges storm flow to both Outfall B to the west and Outfall G to the east. The design maintains the existing drainage areas to Outfalls B and G to the extent practical so storm flows are not increased to either outfall from that which currently exists. Oil and grit treatment currently exists in both the Outfall B and G stormwater conveyance systems for which discharge permit requirements currently exist. Both the existing and proposed stormwater piping is designed for the 50 year, 24-hr storm event. Stormwater conveyance structures are designed for a 25 year, 24-hr storm event. The discharge to Outfall B includes an automated blocking valve and oil minder" to detect and automatically isolate stormwater flows from the Site in the event of an uncontrolled release of oil.

3.3.1 Stormwater System Layout

The proposed layout of the new stormwater system is shown on Drawing C-010. This system includes a network of piping that conveys stormwater flows from the west and east side of the Site to Outfall B and Outfall G, respectively. Piping will consist of double gasketed corrugated high density polyethylene pipelines and standard sized cast in place concrete water quality structures. The stormwater piping and conveyance structures will be sized to handle 50-year and 25-year 24-hr storm events, respectively. Additional detail on the system sizing and depths will be provided in the 95% RDR submittal. Design drawings that detail invert elevations and stormwater conveyance structure depths will also be provided in future RDR submittals.

3.3.2 Proposed Installation Approach

Stormwater piping and conveyance structures will be installed in phases as excavation activities are taking place. The placement and sequencing of phases will be done to allow for the installation of piping and structures. Additional detail on the system installation will be provided in the 95% RDR submittal.

3.4 BACKFILL/COMPACTION

Imported backfill material will be tested to confirm it complies with 6 NYCRR Part 375-6.8(b) Restricted Residential Use soil cleanup objectives unless it is:

- Rock or stone, consisting of virgin material from a permitted mine or quarry; or

- Granular fill material (less than 10% passing #80 sieve) that is virgin material from a NYSDOT approved source.

Materials meeting the above criteria in the above bullets can be imported and used as backfill without chemical testing. All other material will be tested at the frequencies outlined in the CSAP. Samples will be analyzed by a NYSDOH-certified Environmental Laboratory Accreditation Program ("ELAP")-approved laboratory.

Structural Backfill for Concrete Sub-Base

As previously stated, concrete on the Site will be underlain by a minimum of 6 inches of structural fill sub-base material to provide support to the concrete pavement.

The six inches of gravel will be crushed gravel or crushed stone with a NYSDOT Standard Specifications for Coarse Aggregate size designation Type 2 (or approved equivalent). This NYSDOT designation includes the following designation:

Sieve Size	**Percent Passing**
1.5"	100%
1 inch	90% - 100%
1/2 inch	0% - 15%

Compaction

Within the water table, backfill will be placed in loose layers and tamped in-place using excavation equipment. Above the groundwater table, all backfill will be placed in 12-inch thick lifts and mechanically compacted to a minimum of 90 percent of the modified proctor density (as determined by ASTM D1557).

Once subgrade elevation is reached the entire phase will be proof rolled by a vibratory roller prior to placement of the structural backfill under the concrete pavement.

3.5 TRANSFORMER WASH DOWN SHELTER

A transformer wash down shelter will be constructed in Row "F1" of the Site to provide an enclosed area for power washing and cleaning of field returned transformers. This structure will be designed to include light and power services and will include a grated pit to collect contaminated water that is rinsed off of the transformer units. The pit will trap the rinse water and will not have drains or outlets. Water and grit trapped in the wash down area will be periodically removed by Con Edison personnel during the course of their operations and disposed of at an approved off-site disposal facility. This will be a permanent structure for primary use by the Con Edison prior to the inspection and storage of field returned transformers. Additional detail on the transformer wash-down shelter, including design detail drawings and technical specifications will be provided in the 95% RDR submittal.

3.5.1 Facility Light, Water and Power Sources

The shelter will be supplied with electric power that will be routed from the Cable building. The power will include lighting to allow for visibility while working in the transformer wash down shelter and electrical outlets to power equipment.

The shelter will be equipped with water facilities to allow for wash down activities to take place within the shelter. The water supply for these wash down activities will be connected to the existing water main that runs along through the eastern edge of the Site. Two 1-inch diameter yard hydrants will be installed adjacent to the shelter for use when washing down the transformer units. These hydrants will be located based on subsequent discussions with Con Edison operating groups and will be indicated on design drawings provided in the 95% RDR submittal.

The selected remedial contractor will be responsible for making all connections to the appropriate utilities at the Site and ensuring that connections are secure and installed safely.

3.5.2 Design and Construction Approach

The Transformer Wash Down Shelter will consist of a 48-ft long by 21-ft wide fabric sheltery (e.g., Big Top Shelter or equivalent) that will be set upon a 3-ft high concrete wall. The concrete wall will run along the width of the shelter and the front and rear openings of the shelter will be located along the 48-ft long sides. The open sides of the shelter will have clear curtain walls to allow access and provide protection from inclement weather.

The width dimension of the structure will have permanent fabric sides/walls that will be permanently attached to the top of the 3-ft high concrete wall. The walls will have clear lower panels to allow for natural light. The final shelter height will be determined based on the height of the equipment and transformer units that are entering and exiting the structure and will be provided in the 95% RDR submittal.

To prevent pooling of liquids in the structure, the floor within the shelter will be gently pitched (at a slope of 1 inch in 12 ft of length) towards a grated pit which will reside in the center of the shelter. The pit will be 36 ft in length, running parallel to the length of the shelter, and 15 ft wide, with a depth of 2 ft. The water and sediment from transformers will collect in the grated pit for regular removal and appropriate treatment/disposal.

The concrete outside of the structure will be sloped away from the transformer wash down shelter to prevent water from outside of the shelter from entering the structure and pooling in the pit area.

Additional detail and supporting design drawings and specifications will be provided in the 95% RDR submittal.

3.6 CONSTRUCTION WATER TREATMENT/MANAGEMENT

Based on the PCB Area Excavation depths outlined in the ICMWP and the proposed stormwater management system, it is expected that some dewatering will be required during construction activities. A dewatering system and water treatment system will be used to maintain dry conditions during excavation and backfilling.

3.6.1 Excavation Dewatering

The dewatering system will likely consist of pumps installed in sumps within the excavations or other approved means and methods by the selected remedial contractor. Water will be removed and pumped either to a holding tank for off-site disposal in a Con Edison approved disposal facility or to a temporary water treatment system and then discharged either to surface waters through Outfalls B or G in accordance with NYSDEC requirements.

3.6.2 Construction Water Treatment and Disposal

Construction water from dewatering activities that will be treated and discharged at the Site will be treated and sampled as necessary to meet the surface water requirements issued by the NYSDEC either in requirements specified under a stormwater consent order by Region 2 for the Outfall B and Outfall G construction projects (as specified in the tables below). The remedial contractor will be responsible for ensuring that during dewatering and discharging activities, all requirements set forth in the NYSDEC's requirements are met. The anticipated surface water discharge limits are provided below:

Surface Water Discharge Limits:

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
TBD	Groundwater Construction dewatering	East River or Luyster Creek		

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
pH	6.0	9.0	SU	Monthly	Grab	

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL		ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max.	TYPE I				
Flow				MGD	Daily	Calculated	
Total Suspended Solids		50		mg/l	Monthly	Grab	
Oil & Grease		15		mg/l	Monthly	Grab	
Tetrachloroethene			0.026	mg/l	Monthly	Grab	
Benzene			0.10	mg/l	Monthly	Grab	
Toluene			0.10	mg/l	Monthly	Grab	
Xylenes			0.10	mg/l	Monthly	Grab	
Ethylbenzene			0.10	mg/l	Monthly	Grab	
Chromium			50	ug/l	Monthly	Grab	
Copper, Total			61	ug/l	Monthly	Grab	
Lead, Total			204	ug/l	Monthly	Grab	
Mercury			50	ng/l	Monthly	Grab	
Antimony			63	ug/l	Monthly	Grab	

Cadmium			77	ug/l	Monthly	Grab	
Nickel, Total			74	ug/l	Monthly	Grab	
Beryllium			11	ug/l	Monthly	Grab	
Selenium			50	ug/l	Monthly	Grab	
Silver			50	ug/l	Monthly	Grab	
Thallium			20	ug/l	Monthly	Grab	
Zinc, Total			66	ug/l	Monthly	Grab	
PCBs/ Arochlor		200		ng/l	Monthly	Grab	

3.7 SITE RESTORATION

Site restoration activities will consist of regrading and covering the Site as shown on Design Drawings C-006 and C-007; reconstructing previously existing sheds and one story structures in the excavation areas as shown in Design Drawing C-009, and restoring concrete and curbing that were previously present. Restoration will also include re-establishing chain link fencing where it was present and removing soil erosion and sediment control measures.

3.7.1 Concrete Installation

The Site will be restored with a 10-inch thick reinforced concrete pavement system. The concrete will be have an ultimate strength of 5,000 pounds per inch (PSI) at 28 days and will include two rows (top and bottom) of grade 60 epoxy coated rebar. The water-cement ratio will be 0.40 using ASTM C150 Type 1 cement. Air entrainment in the concrete will be between 4% and 6%. Additional information on the concrete design will be provided in the 95% RDR submittal.

SECTION 4

DESIGN AND CONSTRUCTION SCHEDULE

4.1 DESIGN AND CONSTRUCTION SCHEDULE

The preliminary project schedule for the remedial design and construction is presented below. This schedule tracks the remedial design tasks from preparation of this RDR through implementation of the remedial construction activities. This schedule is identified as "DRAFT" and is subject to change based on additional needs and considerations identified during the development of the 95% RDR submittal. This draft schedule may be modified as the remedial design is developed and completed.

TASK	MILESTONE DATE
Submit 50% RDR to the NYSDEC	February 2015
NYSDEC Comments on the 50% RDR	February 2015
Submit 95% RDR to the NYSDEC	April 2015
Comments on the 95% RDR April 2015	April 2015
Submit 100% RDR to the NYSDEC	May 2015
NYSDEC Approval of the 100% Design RDR	June 2015
Remedial Contractor Mobilization for Remedial Construction	TBD by Con Edison
Remedial Construction is Completed By Remedial Contractor	TBD by Con Edison

SECTION 5

PERMITS REQUIRED FOR CONSTRUCTION AND REMEDIATION

5.1 GENERAL

This section provides detail on the property agreements and deed restrictions for the Site. It also outlines all applicable local, state, and federal permits that will be required for the Site remediation and construction activities.

5.2 PROPERTY AGREEMENTS/DEED RESTRICTIONS

The Site is located entirely within the Con Edison owned Astoria Facility. No access agreements will be needed to complete remediation at the Site.

The Site is currently used as an active operating facility by Con Edison. No immediate future need to sell the property is anticipated; therefore, a deed restriction will not be implemented at this time. If at a later date it is determined that one will be needed, the deed restriction will be pursued at that time.

5.3 LOCAL PERMITS

The selected remedial contractor will be required to obtain all applicable local permits that are required to perform the remediation and construction. This includes several New York City Department of Buildings Permits including the General Permit, Building Permit (for all permanent structures including the Transformer Wash Down Shelter and one story buildings on the Site), and a Plumbing Permit (for the installation of the stormwater system). In addition, a New York City Department of Buildings (DOB) Demolition Permit will be needed.

5.4 STATE PERMITS

To discharge the treated water from excavation and construction dewatering efforts, the selected remedial contractor will be required to comply with either the Astoria Facility modified SPDES permit for the Outfall B and Outfall G projects which includes the applicable chemical quality limits for water that will be discharged through storm sewers adjacent to the Site. Prior to starting construction, a SPDES Construction Activities General Permit will also be obtained by Con Edison. Additionally, a New York State General Construction permit will be needed.

5.5 FEDERAL PERMITS

Any federal permits that may be identified will be included in the 95% RDR submittal.

SECTION 6

PROJECT IMPLEMENTATION/ REMEDIAL CONTRACTOR SELECTION

6.1 CONSTRUCTION IMPLEMENTATION

All construction activities will be performed in accordance with the NYSDEC approved 100% RDR and any amendments subsequently approved by the NYSDEC. The activities will be governed by the drawings and specifications that accompany the 100% RDR. A remedial contractor procured by Con Edison will be responsible for the implementation of the site remediation and construction activities. Subcontractors will be utilized by the remedial contractor as needed/required.

6.2 REMEDIAL CONTRACTOR SELECTION

Con Edison will procure a remedial contractor in accordance with Con Edison procurement policies and procedures. The 100% RDR, design drawings and technical specifications will be used to support the procurement. A bid package will be prepared providing the background, technical and contractual information to be issued to bidding contactors for the preparation of technical and cost proposals for the project. Con Edison will only evaluate bid packages from qualified remedial contractors.

Following the evaluation of submitted bids and the selection of the remedial contractor, a contract will be awarded. A Notice to Proceed with field work will be issued to the selected remedial contractor after the contractor obtains Con Edison approvals of designated submittals.

6.3 REMEDIAL CONTRACTOR SUBMITTALS

Once the remedial contractor has been selected, they will be responsible for the preparation of numerous submittals which will be specified in the 95% RDR submittal.

Remedial contractor submittals will provide additional, specific details on the following:

- Contractor's Health and Safety Plan to address construction worker health and safety requirements;
- Dewatering Plan and Construction Water Treatment plan to address activities related to generation of construction water, treatment and disposal;
- The planned site preparation necessary to facilitate the remedial construction activities;
- The planned labor, materials and equipment necessary to implement the remedial construction activities;
- The planned sequencing for implementing the remedial construction activities (this may deviate from the detail provided in section 3.2.2.1, 'Sequencing and Phasing of Excavation Areas', but will not impact the PCB Excavation Areas defined in this RDR);
- An Excavation and Materials Management Plan including the on-site management of excavations and earth support systems, excavated soils and materials and the transportation of clean backfill material to be brought on-site;

- A Waste Management Plan including the off-site disposal of excavated material and liquids;
- An Operation/Work Plan including planned truck routes, equipment staging area, material staging areas, soil erosion and sediment control measures, decontamination pad(s) locations, decontamination procedures, exclusion zones and contamination reduction zones, etc.

In addition, the prepare amendments Construction Quality Assurance Project Plan (CQAPP) included with this RDR.

6.4 QUALITY ASSURANCE AND CONTROL

A CQAPP has been developed to identify quality assurance control/quality control (QA/QC) needs during project activities and to ensure the integrity of all analytical data obtained during construction and remediation activities performed at the Site. The CQAPP is included in Appendix G. The selected remedial contractor will be required to adapt or submit amendments to the CQAPP. This will provide details regarding methods and procedures that will be implemented to ensure all remediation and construction activities will be performed in accordance with the 100% RDR and associated technical documents. The CQAPP will define roles and responsibilities for performing quality control, and will include:

- The roles and responsibilities of personnel performing the remediation and construction activities;
- QA/QC objectives to ensure the integrity of data;
- Procedures for collecting, handing and tracking all environmental samples;
- Routine quality inspections and audits;
- QA/QC sampling and testing
- Preventive measure procedures to ensure the integrity of the data
- Corrective action procedures.

6.5 CONSTRUCTION HEALTH AND SAFETY

The remedial contractor will develop a Construction Health and Safety Plan (CHASP) and submit it to Con Edison for their review and approval. The remedial contractor is responsible for all work zone air monitoring required for their workers. Air monitoring will be performed in accordance with the Con Edison approved Construction Health and Safety Plan (CHASP).

The remedial contractor is responsible for all work zone air monitoring required for the remedial contractor's workers and will be performed in accordance with the Con Edison approved Construction Health and Safety Plan (CHASP) to be developed by the remedial contractor.

SECTION 7

REFERENCES

AECOM, November 2014. Astoria East Yard Interim Corrective Measures Work Plan, Astoria Facility, Queens, NY

ASTM, April 2014. Volume 4.09 Annual Book of ASTM Standards

NYSDEC, May 3, 2010. DER-10/Technical Guidance for Site Investigation and Remediation

NYSDEC, November 3, 2009. CP-43: Groundwater Monitoring Well Decommissioning Policy

Parsons, December 2014. Structural Basis of Design, Astoria East Yard, Queens, NY

Parsons, December 2014, Slug Test Evaluation Memorandum, Astoria Facility, East Transformer SWMU, Astoria, Queens, NY

Parsons, October 2014, Astoria East Transformer Storage Yard Workplan: Summary of Field Activities

Con Edison Specification, CE-ES-3400, Part 2060, *Demolition*

Con Edison Specifications, CE-SS-3400, Part 2200, *Excavation and Backfill*

Con Edison Specification, *General Environmental, Health and Safety Instruction E05.13*

Con Edison Specification, CE-ES-3203, *Removal and Disposal of Construction and Demolition Debris*

APPENDIX A

DESIGN CALCULATIONS

APPENDIX A1

EARTHWORK VOLUME ESTIMATES

Earthwork volume estimate calculations will be provided in the 95% RDR Submittal.

APPENDIX A2

STORMWATER MANAGEMENT SYSTEM DESIGN CALCULATIONS

Stormwater management system design calculations will be provided in the 95% RDR Submittal.

APPENDIX A3

CONCRETE PAVEMENT LOADING/DESIGN

Concrete pavement loading and design calculations will be provided in the 95% RDR Submittal.

APPENDIX B

50% DESIGN SPECIFICATIONS

50% DESIGN SPECIFICATIONS

Design Specifications will not be provided as a part of the 50% design report. Draft and final design specifications will be provided in the 95% RDR Submittal. The specifications that will be provided in these reports are listed below:

DIVISION TITLE AND SECTION NO.	SECTION TITLE
DIVISION 1 - GENERAL REQUIREMENTS	
01010	Summary of the Work
01011	Engineer's Drawings
01025	Measurement and Payment
01039	Coordination and Meetings
01050	Surveying
01100	Health and Safety Requirements
01110	Environmental Protection Procedures
01310	Coordination with Owner's Operations
01320	Progress Schedule
01350	Submittals
01400	Quality Assurance and Quality Control
01500	Temporary Facilities and Control
01507	Odor Control
01721	Protection of Work and Property
01732	Selective Demolition
01780	Demobilization and Restoration
02070	Geotextiles
02100	Site Preparation
02120	Off Site Transport and Disposal
02145	Groundwater Treatment Systems
02200	Earthwork
02240	Excavation Dewatering
02260	Excavation Support and Protection
02290	Pre- and Post-Condition Surveys
02315	Excavation and Structural Backfill
02370	Erosion and Sediment Control
02630	Storm Drainage Systems
02720	Aggregate Base Course
02750	Continuous Reinforced Cement Concrete Pavement
03050	Concrete Materials and Methods
03300	Cast in Place Concrete
03400	Precast Concrete
03210	Concrete Reinforcement
16120	Electrical and Controls

APPENDIX C

50% DESIGN DRAWINGS

The following Drawings are included in this Report:

Cover Sheet
General Notes and Legend
Existing Conditions
Existing Utilities and Structures
Site Preparation Demolition Plan
Boring Locations & Groundwater Contours
Boring Locations with TPAHs >500 ppm and Visible MGP Impacts)
Remedial Action Site Plan
Remedial Action Sections (2 Drawings)
Construction Phasing Plan
Proposed Site Plan
Boring Locations with PCB Results
Details Sheet
Proposed Structural Site Plan
Transformer Wash Down Shelter Plans (3 Drawings)
Structural Sections and Details (3 Drawings)

Drawings provided in the 95% RDR submittal:

Construction Layout and Staging Plan
Proposed Stormwater Drainage Profiles (2 Drawings)
Proposed Stormwater Drainage Details (3 Drawings)
Proposed Site Plan Details
Proposed Structural Details (2 Drawings)
Construction Details (2 Drawings)
Process and Instrumentation Diagram

APPENDIX D

COMMUNITY AIR MONITORING PLAN

APPENDIX E

TRAFFIC CONTROL PLAN

The Traffic Control Plan will be provided in the 95% RDR Submittal.

APPENDIX F

SECURITY PLAN

The Security Plan will be provided in the 95% RDR Submittal.

APPENDIX G

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

APPENDIX H

SEDIMENTATION AND EROSION CONTROL PLANS/SWPPP

The Sedimentation and Erosion Control Plans/SWPPP will be provided in the 95% RDR Submittal.

APPENDIX I

OPERATION MAINTENANCE AND MONITORING PLAN

The Operation Maintenance and Monitoring Plan will be provided in the 95% RDR Submittal.

APPENDIX J

CONSTRUCTION HEALTH AND SAFETY PLAN

The Parsons Construction Health and Safety Plan will be provided in the 95% RDR Submittal.

APPENDIX K

SLUG TESTING RESULTS

(Included by Reference)

APPENDIX L

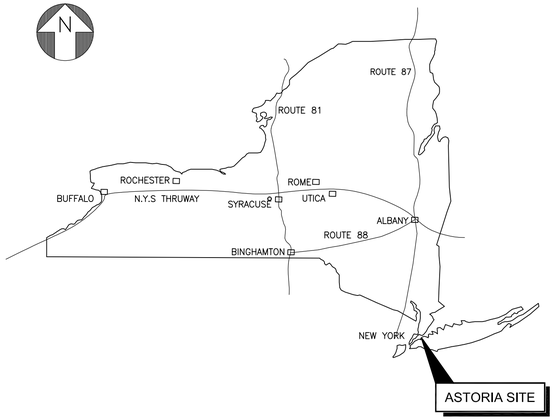
INTERIM CORRECTIVE MEASURES REPORT WITH APPENDICES

The Interim Corrective Measures Report will be provided in the 95% RDR Submittal.

50% REMEDIAL DESIGN
ASTORIA EAST YARD FACILITY
ASTORIA, NEW YORK

Prepared For:

CON EDISON



SITE VICINITY MAP
N.T.S.

DRAWING INDEX

DRAWING No.	ConEd DRAWING No.	REV.	TITLE
G-001	507134	B	COVER SHEET
G-002	507135	B	GENERAL NOTES AND LEGEND
C-001	507136	B	EXISTING CONDITIONS PLAN
C-002	507137	B	EXISTING UTILITIES AND STRUCTURES
C-003	507138	B	SITE PREPARATION AND DEMOLITION PLAN
C-004	507139	B	BORING LOCATIONS AND GROUNDWATER CONTOURS
C-005	507140	B	BORING LOCATIONS WITH TPH >500 PPM AND VISIBLE MGP IMPACTS
C-006	507141	B	REMEDIAL ACTION SITE PLAN
C-007	507142	B	REMEDIAL ACTION SECTIONS (SHEET 1 OF 2)
C-008	507143	B	REMEDIAL ACTION SECTIONS (SHEET 2 OF 2)
C-009	507144	B	CONSTRUCTION PHASING PLAN
C-010	507145	B	PROPOSED SITE PLAN
C-011	507146	B	BORING LOCATIONS WITH PCB RESULTS
D-001	507147	B	DETAILS SHEET
S-001	507148	B	PROPOSED STRUCTURAL SITE PLAN
S-002	507149	B	TRANSFORMER WASH DOWN SHELTER PLANS
S-003	507150	B	RELOCATED CANOPY PLAN
S-004	507151	B	TRANSFORMER WASH DOWN SHELTER ELEVATIONS & SECTIONS
S-005	507152	B	STRUCTURAL SECTIONS AND DETAILS (SHEET 1 OF 3)
S-006	507153	B	STRUCTURAL SECTIONS AND DETAILS (SHEET 2 OF 3)
S-007	507154	B	STRUCTURAL SECTIONS AND DETAILS (SHEET 3 OF 3)

SITE LOCATION MAP
1" = 750'

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507134-B

CON EDISON

DWG. TYPE: COMPANY
DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: COVER SHEET

– APPROVALS –

ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: N.T.S.
DISCIPLINE CODE: GN

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

G-001 | 1 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507134.DWG, DATE: 02/02/2015 11:53:22AM, p0018397

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FENCE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING STORM DRAIN PIPE
- EXISTING SANITARY SEWER PIPE
- EXISTING OVERHEAD WIRES
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNKNOWN UTILITY
- EXISTING TRENCH DRAIN
- EXISTING CURB/GUTTER
- EXISTING CONCRETE SLAB
- EXISTING BUILDING/STRUCTURE
- EXISTING DRAIN MANHOLE
- EXISTING CATCH BASIN (ROUND)
- EXISTING CATCH BASIN
- EXISTING SANITARY SEWER MANHOLE
- EXISTING ELECTRIC MANHOLE
- EXISTING UNKNOWN MANHOLE
- EXISTING ELECTRIC TRANSFORMER
- EXISTING UTILITY POLE
- EXISTING UTILITY POLE W/LIGHT
- EXISTING LIGHT POLE
- EXISTING CLEANOUT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING MONITORING WELL
- EXISTING SOIL BORING
- EXISTING MAGNETIC NAIL SET
- EXISTING CONDUIT TO/FROM UNDERGROUND
- EXISTING ROOF DRAIN LEADER
- EXISTING VENT
- EXISTING CONCRETE PATCH
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM DRAIN PIPE
- PROPOSED WATER LINE
- PROPOSED OVERHEAD WIRES
- PROPOSED SHEETING
- PROPOSED SILT FENCE
- PROPOSED PHASING LIMITS
- PROPOSED LIMITS OF WORK
- PROPOSED LIMITS OF EXCAVATION
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED WATER VALVE
- PROPOSED HYDRANT

ABBREVIATIONS:

BOE	BOTTOM OF EXCAVATION
INV	INVERT
HDPE	HIGH DENSITY POLYETHYLENE
HPP	HIGH PRESSURE PIPE
F.M.	FORCE MAIN
ELEV	ELEVATION
FT	FEET
R	RIM
D	DEPTH

GENERAL:

1. CONTRACTOR SHALL NOTIFY LOCAL GOVERNING AGENCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION OF ANY IMPROVEMENTS UNDER ITS JURISDICTION, AS REQUIRED.
2. CONTRACTOR SHALL PROVIDE TEMPORARY DRAINAGE, SOIL EROSION AND DUST CONTROL MEASURES AS MAY BE DIRECTED BY THE OWNER OR ITS REPRESENTATIVE.
3. CONTRACTOR SHALL INSTALL ALL SOIL EROSION CONTROL MEASURES PRIOR TO THE START OF ANY WORK.
4. CONTRACTOR SHALL PERFORM ALL WORK INDICATED ON THE PROJECT DRAWINGS IN ACCORDANCE WITH THE NYC DOB BUILDING CODE, RULES AND REGULATIONS OF NYS DEC, OR OTHER AUTHORITIES HAVING JURISDICTION, AS WELL AS IN ACCORDANCE WITH CON EDISION STANDARD SPECIFICATIONS AS APPLICABLE. IN CASE OF DIFFERENT REQUIREMENTS FOR THE SAME TYPE OF WORK OR TRADE, THE MORE STRINGENT REQUIREMENT GOVERNS.
5. ALL ROADWAYS ARE TO BE PASSABLE FOR FIRE DEPARTMENT USE DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE ANY ROAD CLOSURE OR RELOCATION WITH CON EDISON PERSONNEL.
6. BEFORE WORK MAY COMMENCE, CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING INLETS, CATCH BASINS, MANHOLES, SIDEWALKS, CURBING, STAIRS, POLES, LANDSCAPED AREAS, AREAS TO BE REMEDIATED, ETC. BRING ANY CONFLICTING INFORMATION FROM THAT SHOWN TO THE IMMEDIATE ATTENTION OF THE OWNER OR ITS REPRESENTATIVE.
7. CONTRACTOR SHALL ACQUIRE ALL NECESSARY PERMITS OTHER THAN THOSE ALREADY OBTAINED BY THE OWNER. PERMITS OBTAINED BY THE OWNER AND INCLUDED WITH THE BID SPECIFICATION PACKAGE INCLUDE SPDES CONSTRUCTION GENERAL PERMIT, AND NYSDEC SPDES EQUIVALENCY DISCHARGE PERMIT.
8. 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 ASTORIA.
9. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL BY THE OWNER A COMPREHENSIVE WORK PLAN THAT SHALL OUTLINE (AT A MINIMUM) EXCAVATION AND BACKFILL, SHORING, EARTH SUPPORT DESIGN, STOCKPILE MANAGEMENT, WASTE DISPOSAL, DEWATERING AND WATER TREATMENT, AND HEALTH AND SAFETY.
10. CONTRACTOR SHALL PROVIDE PORTABLE WHEELWASH/CONTAINMENT SYSTEM FOR DECONTAMINATION OF EQUIPMENT.
11. CONTRACTOR SHALL PROVIDE FRAC TANKS, SUMPS, PUMPS, AND OTHER PERTINENT EQUIPMENT NECESSARY TO MAINTAIN THE EXCAVATIONS FREE OF WATER DURING CONSTRUCTION.
12. THE WORK SHALL BE PERFORMED IN PHASES TO LIMIT THE AREA BEING USED FOR CONSTRUCTION RELATED TO ACTIVITIES AT ANY ONE TIME, SINCE THE SITE CONSISTS OF AN ACTIVE OPERATING TRANSFORMER STORAGE AND EQUIPMENT REPAIR YARD. CONTRACTOR SHALL SEQUENCE AND PERFORM THE WORK TO MINIMIZE INTERRUPTIONS TO OR DISRUPTIONS OF THE ONGOING OPERATIONS AT THE SITE.
13. CONTRACTORS USE OF THE SITE SHALL BE CONFINED TO THE AREAS SHOWN ON THE DRAWINGS.
14. 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.
15. THE CONTRACTOR SHALL COMPLY WITH THE NOISE MITIGATION PROVISIONS OF NEW YORK CITY 15 RCNY CHAPTER 28.

SURVEY NOTES:

1. BASEMAP PROVIDED BY THE CHAZEN COMPANIES, INC. DATED 1/08/2015, BASED ON A SURVEY PERFORMED BY CHAZEN ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE CO., D.P.C. BETWEEN OCTOBER 27–29, 2014.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. A PORTION OF THE UNDERGROUND UTILITY LOCATIONS SHOWN ARE BASED ON FIELD SKETCHES PROVIDED BY THE UNDERGROUND UTILITY LOCATING COMPANY (DGI) AND PARSONS PERSONNEL.
5. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD.

SOIL EROSION AND SEDIMENT CONTROL NOTES:

1. CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO ANY SOIL DISTURBANCE AND MAINTAIN UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH CITY AND STATE GUIDELINES FOR URBAN SOIL AND SEDIMENT CONTROL
3. CONTRACTOR SHALL IMMEDIATELY APPLY A SUB–BASE COURSE FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE ROADS AND PARKING AREAS. INSTALL THE SUB–BASE WITH FIFTEEN (15) DAYS OF THE PERMANENT GRADING IN AREAS WHERE NO UTILITIES ARE PRESENT.
4. THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A STONE PAD OF 2.5 INCH STONE AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE IN EACH PHASE.
5. ANY CHANGES TO THE APPROVED SOIL EROSION AND SEDIMENT CONTROL PLAN REQUIRES APPROPRIATE APPROVALS. CONTRACTOR SHALL PROVIDE REVISED PLANS WHICH MEET ALL CURRENT STATE SOIL EROSION AND SEDIMENT CONTROL GUIDELINES FOR SUBMISSION BY THE OWNER OR ITS REPRESENTATIVE.
6. UNFILTERED DE–WATERING IS NOT PERMITTED. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS DURING ALL DE–WATERING ACTIVITIES TO MINIMIZE SEDIMENT TRANSFER.
7. IF IT IS NECESSARY TO CONTROL DUST, CONTRACTOR SHALL SPRINKLE THE SITE UNTIL THE SURFACE IS WET.
8. CONTRACTOR SHALL IMMEDIATELY REMOVE ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMITS OF WORK OR ONTO PUBLIC RIGHT OF WAYS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EROSION AND SEDIMENTATION THAT MAY OCCUR AS A RESULT OF CONSTRUCTION ACTIVITIES.
10. CONTRACTOR SHALL INSTALL TEMPORARY HAYBALES IN THE DRAINAGE INLETS AND ALONG CRITICAL AREAS, AS NECESSARY OR AS DIRECTED BY THE ENGINEER, DURING CONSTRUCTION ACTIVITIES AND REMOVE UPON ESTABLISHMENT OF PROPOSED CONCRETE SURFACE.

UTILITY NOTES:

1. PROVIDE AN EXCAVATION WORK PLAN WHICH INCLUDES THE FOLLOWING PRIOR TO THE START OF WORK:
   - ALL SAFETY PROCEDURES USED, AND METHODS OF COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS
   - THE METHODS ANTICIPATED
   - A STAGING PLAN
   - TEMPORARY EARTH SUPPORT WITH SIGNED P.E. SEALED DESIGN BY AN ENGINEER LICENSED TO PRACTICE IN THE STATE OF NEW YORK
   - DEMONSTRATION OF MINIMIZATION OF SITE DISTURBANCE
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DEWATERING AND PRECLUDING ANY PONDING OF WATER IN ALL AREAS EXCEPT WHERE REASONABLE AND SAFE WITHIN THE INTENDED AREA WITH SOIL EROSION AND SEDIMENT CONTROL.
3. THE APPROXIMATE LOCATION OF KNOWN UTILITY STRUCTURES ARE SHOWN ON THE PLANS. THE ACCURACY OF AND COMPLETENESS OF THIS INFORMATION IS NOT GUARANTEED. FIELD VERIFY THE UTILITY LOCATIONS AND OTHER CONSTRUCTION OBSTACLES PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL RESTORE EXISTING STREET SURFACES AND OTHER SURFACES DISTURBED BY THE CONSTRUCTION OF FACILITIES FOR THIS PROJECT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER OR ITS REPRESENTATIVE.
5. ALL EXISTING UTILITY MANHOLE RIMS, VALVE BOXES,, ETC. OTHER THAN STORM, TO BE RESET BY THE CONTRACTOR OR APPLICABLE UTILITY COMPANY OR AUTHORITY.
6. ADDITIONAL EASEMENTS NOT SHOWN ON THE PLANS MAY NE NECESSARY FOR PLACEMENT OF UTILITY STRUCTURES. CONTRACTOR SHALL VERIFY THE EXISTENCE OF ANY REQUIRED EASEMENT. PARSONS CORPORATION ASSUMES NO LIABILITY FOR ANY OF THE EASEMENT INFORMATION SHOWN HEREIN. EASEMENTS SHOWN ON THESE PLANS ARE FOR SCHEMATIC PURPOSES ONLY AND MAY NOT REFLECT ALL EASEMENTS. CONTRACTOR SHALL VERIFY ALL EASEMENT INFORMATION AND ALL EASEMENT LOCATIONS INDICATED IN THE FIELD BY SURVEY.
7. CONTRACTOR SHALL NOTIFY "NEW YORK CITY – LONG ISLAND ONE CALL CENTER" (800–272–4480) PRIOR TO ANY EXCAVATION OR GRADING.
8. 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.

DRAINAGE SYSTEM NOTES:

1. UNLESS OTHERWISE NOTED OR INFERRED BY INVERT ELEVATIONS, CONTRACTOR SHALL MATCH PIPE CROWN ELEVATIONS IN ALL MANHOLES AND INLETS.
2. SET ALL STORM SEWER INLETS AND MANHOLES ON A BED OF 3/4" CRUSHED STONE.
3. UNLESS OTHERWISE NOTED, CONTRACTOR SHALL FIT ALL STORM SEWER INLETS WITH ADA COMPLIANT HEEL SAFE GRATES.

DEMOLITION NOTES:

1. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND INCIDENTALS AS INDICATED ON THE PLANS REQUIRED FOR DEMOLITIONS, REMOVAL AND DISPOSAL. WORK SHALL INCLUDE DEMOLITION ASSOCIATED WITH EXISTING STRUCTURES AND FACILITIES AND REMNANT SUBSURFACE STRUCTURES, PROCESS PIPING, AND FACILITIES.
2. DEMOLITION INCLUDES STRUCTURAL CONCRETE, FOUNDATIONS, WALLS, DOORS, WINDOWS, METALS, ROOFS, MASONRY ATTACHMENTS, APPURTENANCES, PIPING, ELECTRICAL AND MECHANICAL EQUIPMENT, PAVING, CURBS, SIDEWALKS, FENCING, PIPING AND SIMILAR EXISTING FACILITIES IN ACCORDANCE WITH CON EDISON SPECIFICATION CE–SS–3400, DEMOLITION.
3. DEMOLITION AND REMOVALS, WHICH MAY MAY BE SPECIFIED UNDER OTHER SECTIONS SHALL CONFORM TO REQUIREMENTS OF THIS SECTION.
4. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLITION MATERIALS AT AN APPROVED CON EDISON DISPOSAL FACILITY.
5. THE CONTRACTOR SHALL CONDUCT A PRE–DEMOLITION SURVEY AND VERIFICATION OF THE CONDITION OF EXISTING STRUCTURES AND FACILITIES TO BE MAINTAINED. THE PRE–DEMOLITION SURVEY SHALL CONSIST OF PHOTOGRAPHS, AND A BRIEF WRITTEN REPORT.
6. THE CONTRACTOR SHALL PERFORM ALL DEMOLITION AND REMOVAL WORK TO PREVENT DAMAGE OR INJURY TO STRUCTURES, ADJACENT FEATURES WHICH MIGHT 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. 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 CON EDISON AND ALL OPERATIONS SHALL BE CONDUCTED WITH A MINIMUM INTERFERENCE TO ACCESS THESE WAYS.
8. THE CONTRACTOR SHALL ERECT AND MAINTAIN BARRIERS, LIGHTS, SHEDS AND OTHER NECESSARY PROTECTIVE DEVICES.
9. THE CONTRACTOR SHALL REPAIR DAMAGE THAT MAY OCCUR AS A RESULT TO THEIR ACTIVITIES TO FACILITIES AND/OR STRUCTURES TO REMAIN, OR TO ANY PROPERTY BELONGING TO CON EDISON AT THE CONTRACTORS OWN COST.
10. THE CONTRACTOR 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 CON EDISON'S OPERATIONS.

EXCAVATION NOTES:

1. PRIOR TO THE START OF ANY INTRUSIVE WORK, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, INCLUDING A WORK PERMIT THAT IS ISSUED BY FACILITIES OPERATIONS AND MAINTENANCE.
2. DURING EXCAVATION WHERE MATERIALS MAY BE ENCOUNTERED SATURATED WITH PETROLEUM, COAL TAR, OR OTHER POTENTIALLY HAZARDOUS SUBSTANCES ENCOUNTERED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY CON EDISON'S PROJECT REPRESENTATIVE. THE DISCOVERY OF SUCH CONDITION SHALL REQUIRE NOTIFICATIONS IN ACCORDANCE WITH CORPORATE ENVIRONMENTAL PROCEDURES (CEP 10.1) AND CON EDISONS GENERAL ENVIRONMENTAL INSTRUCTIONS (GEI 2.01) AS WELL AS NOTIFICATIONS TO THE EH&S REMEDIATION GROUP (718–204–4140) OR KENNETH J. KAISER AT (781–267–3881).
3. THE CONTRACTOR SHALL EXCAVATE, CHARACTERIZE AND DISPOSE OF ALL MATERIALS WITHIN THE PCB EXCAVATION AREA TO THE DEPTHS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL TAKE ALL PROVISIONS NECESSARY TO MINIMIZE ANY ADDITIONAL MATERIALS WHICH ARE OUTSIDE THE EXCAVATIONS (SLOPED EXCAVATIONS SIDEWALLS OR OVER EXCAVATION OF THE BOTTOM) WHILE REMAINING IN CONFORMANCE WITH THE OSHA REGULATIONS PERTAINING TO EXCAVATIONS. ALL MATERIALS FROM WITHIN THE PCB EXCAVATION AREAS SHALL BE SEGREGATED FROM MATERIALS EXCAVATED OUTSIDE OF THE PCB EXCAVATION AREAS OR DEMOLITION MATERIALS LOCATED OUTSIDE OF THE LIMITS OF THE PCB EXCAVATION AREAS. SHOULD THE POST EXCAVATION CONFIRMATORY SAMPLING REQUIRE A PCB EXCAVATION AREA TO EXPAND (EITHER LATERALLY OR VERTICALLY), ALL MATERIAL REMOVED AS A RESULT OF THE EXPANSION SHALL BE CONSIDER PART OF THE PCB EXCAVATION AREA AND DISPOSED OF IN A LIKE MANNER.
4. IN AREAS OUTSIDE OF THE PCB EXCAVATION AREAS, ANY MATERIAL BENEATH THE SLAB AND/OR ASPHALT EXCAVATED WITHIN THE TOP TWO FEET BELOW EXISTING GRADE SHALL BE SEGREGATED BY THE CONTRACTOR FOR WASTE CHARACTERIZATION AND OFF SITE TRANSPORT BY CON EDISON APPROVED TRANSPORTERS TO A CON EDISON APPROVED DISPOSAL FACILITY. THIS EXCAVATED SOIL SHALL NOT BE USED AS BACKFILL.
5. IN AREAS OUTSIDE OF THE PCB EXCAVATION AREAS, THE CONTRACTOR SHALL SEGREGATE ANY MATERIAL EXCAVATED FROM DEPTHS GREATER THAN TWO FEET BELOW EXISTING GRADE. SEGREGATED SOIL MAYBE USED AS BACKFILL WITHIN EXCAVATIONS OUTSIDE OF PCB EXCAVATION AREAS, AT DEPTHS GREATER THAN TWO FEET BELOW EXISTING GRADE. CONTRACTOR SHALL PERFORM WASTE CHARACTERIZATION FOR OFF SITE DISPOSAL BY CON ED APPROVED TRANSPORTERS AT A CON EDISON APPROVED DISPOSAL FACILITY FOR ALL SURPLUS MATERIAL NOT REUSED AS BACKFILL. THIS SURPLUS MATERIAL SHALL NOT BE USED AS BACKFILL WITHIN PCB EXCAVATION AREAS. SURPLUS MATERIAL MAY BE COMBINED WITH MATERIAL FROM ABOVE TWO FEET BELOW EXISTING GRADE FOR WASTE CHARACTERIZATION AND DISPOSAL PURPOSES.
6. ALL EXCAVATED MATERIAL WITH THE EXCEPTION OF C&D WASTE MATERIALS WILL BE STAGED IN AN AREA DESIGNATED BY CON EDISON FOR WASTE CHARACTERIZATION, AND PLACED EITHER:
   i. ON IMPERVIOUS TARPS OR PLASTIC WITH A BERMED PERIMETER, COVERED AND SECURED WITH WEIGHTED–DOWN IMPERVIOUS TARPS OR PLASTIC. STOCKPILES THAT ARE NOT CONSTRUCTED WITH A BERMED PERIMETER SHOULD BE SURROUNDED BY ABSORBENT BOOMS TO CONTAIN ANY POSSIBLE RELEASES FROM THE PILE. SOIL SHALL REMAIN COVERED AT ALL TIMES EXCEPT WHEN IT IS ACTIVELY BEING ADDED OR REMOVED FROM THE PILE. IF NECESSARY TO PREVENT DUST FORMATION FROM SOIL THAT IS TEMPORARILY UNCOVERED, THE SOIL SHALL BE WETTED, AS NEEDED; OR
   ii. IN LINED ROLL–OFF BOXES COVERED WITH A WATERPROOF COVER. DRUMMED MATERIALS SHALL HAVE APPROPRIATE CONTAINMENT AND ROLL–OFF BOXES SHALL BE PLACED ON IMPERVIOUS TARPS OR PLASTIC TO CONTAIN ANY POSSIBLE RELEASES. SOIL–CONTAINING DRUMS AND ROLL–OFF BOXES SHALL REMAIN COVERED EXCEPT WHEN SOIL IS ACTIVELY BEING PLACED INTO THE DRUM OR LOADED INTO ROLL–OFF BOXES.
7. ALL BACKFILL SHALL BE PLACED IN LIFTS AND COMPACTED TO MEET THE TECHNICAL SPECIFICATION REQUIREMENTS. NO SOIL EXCAVATED FROM OUTSIDE OF THE REMEDIATION AREAS DESIGNATED FOR RE–USE SHALL BE PLACED WITHIN THE TOP TWO FEET OF THE FINISHED GRADE.
8. THE CONTRACTOR SHALL SUBMIT TEMPORARY EARTH SUPPORT DESIGN, DRAWINGS, AND CALCULATIONS TO ENGINEER FOR REVIEW AND COMMENT. TEMPORARY EARTH SUPPORT SHALL NOT BE INSTALLED UNTIL THE CONTRACTORS DESIGN SUBMITTAL HAS BEEN REVIEWED AND ACCEPTED BY THE ENGINEER AND CON EDISON. WORKING DRAWINGS AND CALCULATIONS FOR THE TEMPORARY EARTH SUPPORT DESIGN SHALL BE PREPARED BY A PROFESSIONAL ENGINEER (PE) LICENSED IN THE STATE OF NEW YORK, AND SHALL CARRY HIS/HER SIGNATURE AND SEAL.
9. ALL EXCAVATION, TRENCHING, SHEETING, BRACING, AND RELATED ACTIVITIES SHALL FULLY COMPLY WITH THE REQUIREMENTS OF OSHA EXCAVATION SAFETY STANDARDS (29 CFR PART 1926).
10. THE SUBSURFACE SOILS ARE KNOWN TO CONTAIN REMNANT CONSTRUCTION DEBRIS AND RUBBLE IN VARYING QUANTITIES AND SIZE ALONG WITH ABANDONED AND ACTIVE SUBSURFACE UTILITIES. THE DESIGN AND INSTALLATION OF THE TEMPORARY EARTH SUPPORT MEASURES SHALL CONSIDER THE PRESENCE OF THESE OBSTRUCTIONS.
11. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION DEWATERING PLAN (PLAN) SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK. THE PLAN SHALL INCLUDE THE PROPOSED TYPE OF DEWATERING SYSTEM THAT IS OF SUFFICIENT SCOPE, SIZE, AND CAPACITY TO CONTROL GROUNDWATER FLOW TO PERMIT EXCAVATION TO PROCEED AND MEET ALL DISCHARGE REQUIREMENTS IF INTRODUCED INTO CON EDISONS OUTFALL SYSTEM. ALTERNATELY, WATER FROM CONSTRUCTION DEWATERING MAY BE STAGED FOR WASTE CHARACTERIZATION AND OFFSITE DISPOSAL BY A CON EDISON APPROVED TRANSPORTER AT A CON EDISON APPROVED FACILITY.
12. 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.

NOTES ON USE OF PLANS:

1. ONLY DRAWINGS AND SPECIFICATIONS INDICATING "ISSUED FOR CONSTRUCTION" SHALL BE USED FOR BIDDING AND/OR CONSTRUCTION PURPOSES. DRAWINGS ARE INTENDED TO BE USED WITH THE TECHNICAL SPECIFICATIONS. UNLESS 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 HIMSELF REGARDING ALL CONDITIONS AFFECTING HIS 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 AND REVIEW IN THE FIELD. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY CON EDISON OR THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE FIELD CONDITIONS.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507135-B

CON EDISON | DWG. TYPE: COMPANY | DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: GENERAL NOTES AND LEGEND

– APPROVALS –

ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	N.T.S.
DISCIPLINE CODE:	GN

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008–01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

G–002 | 2 of 27

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507135.DWG, DATE: 02/02/2015 02:47:00PM, p0009568

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507136-B

CON EDISON — DWG. TYPE: COMPANY; DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: EXISTING CONDITIONS PLAN

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: SMA

DESIGNER: RR

DRAWN BY: RR

SCALE: 1"=30' — DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-001 — 3 of 21

SCALE: 1" = 30'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507136.DWG, DATE: 02/02/2015 12:12:20PM, p0018397

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507137-B

CON EDISON

DWG. TYPE: COMPANY
DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: EXISTING UTILITIES AND STRUCTURES

– APPROVALS –

ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: 1"=30'
DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-002 | 4 of 21

SCALE: 1" = 30'

WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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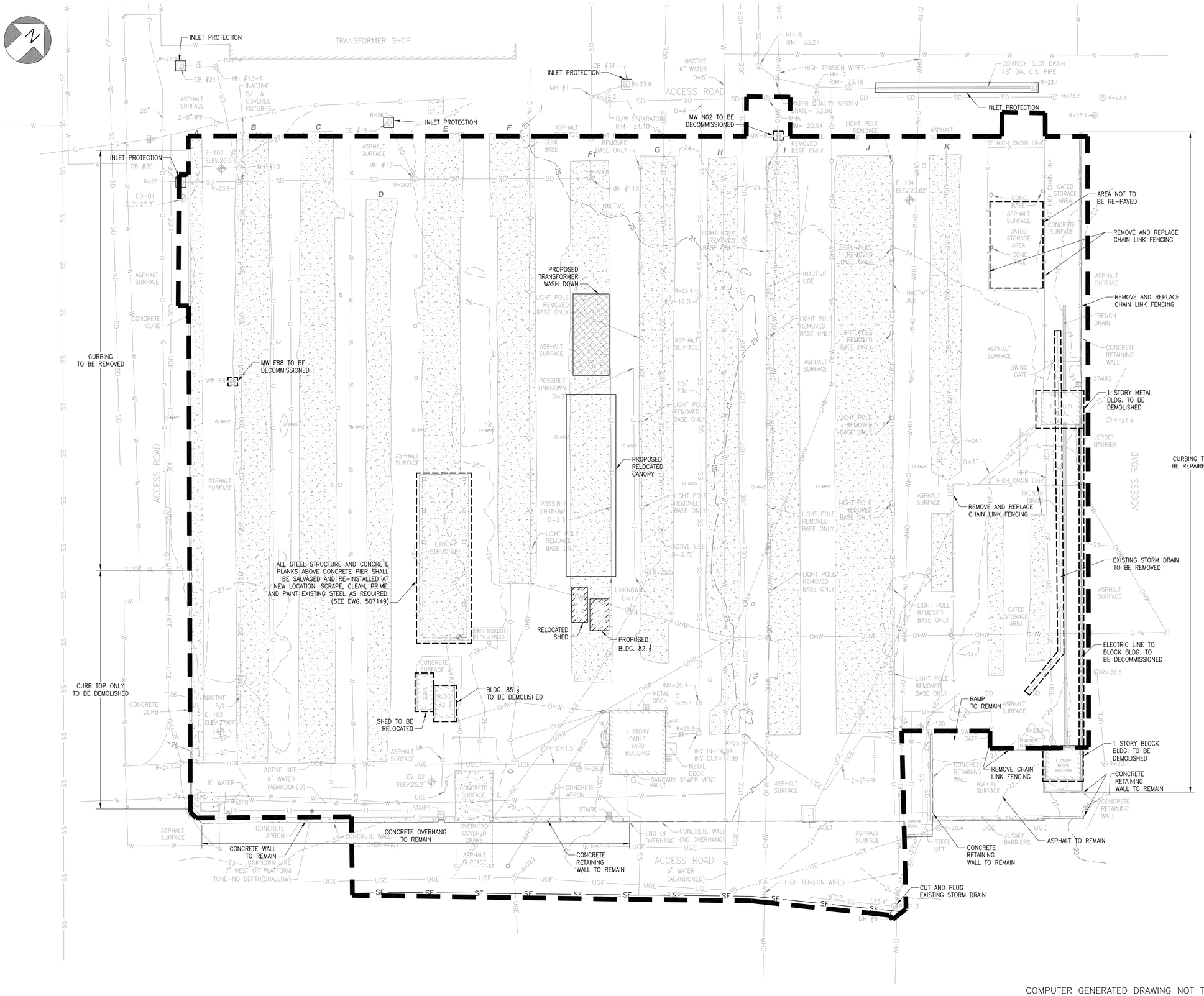

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
3. CONTRACTOR SHALL COORDINATE ALL DEMOLITION AND CONSTRUCTION ACTIVITIES WITH CON EDISON IN ORDER TO ENSURE NO INTERRUPTION IN OPERATIONS. SPECIFICALLY, OVERHEAD CRANE, CABLE YARD BUILDING, AND BUILDING 82 ½ MUST REMAIN FULLY FUNCTIONAL AND ACCESSIBLE DURING DEMOLITION AND CONSTRUCTION.
4. DEMOLITION OF BUILDING 82 ½ MUST BE COORDINATED WITH CON EDISON. PROPOSED BUILDING 82 ½ MUST BE FULLY OPERATIONAL PRIOR TO DEMOLITION OF THE EXISTING BUILDING IN ORDER TO AVOID INTERRUPTION OF SERVICE TO CON EDISON PERSONNEL.
5. CONCRETE SLAB AND ASPHALT WITHIN THE PROPOSED LIMITS OF WORK SHALL BE REMOVED IN ITS ENTIRETY UNLESS OTHERWISE INDICATED IN THE STRUCTURAL DRAWINGS
6. THE CONCRETE SLAB IS ASSUMED TO EXIST BELOW THE ASPHALT WITHIN THE PROPOSED LIMITS OF WORK.
7. CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES AND STRUCTURES WITHIN THE PROPOSED LIMITS OF WORK UNLESS OTHERWISE SHOWN ON THESE DRAWINGS.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES		
REV	DES	ENG

DWG. NO. 507138-B

CON EDISON — DWG. TYPE: COMPANY; DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: SITE PREPARATION AND DEMOLITION PLAN

– APPROVALS –

ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	1"=30'
DISCIPLINE CODE:	CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-003 — 5 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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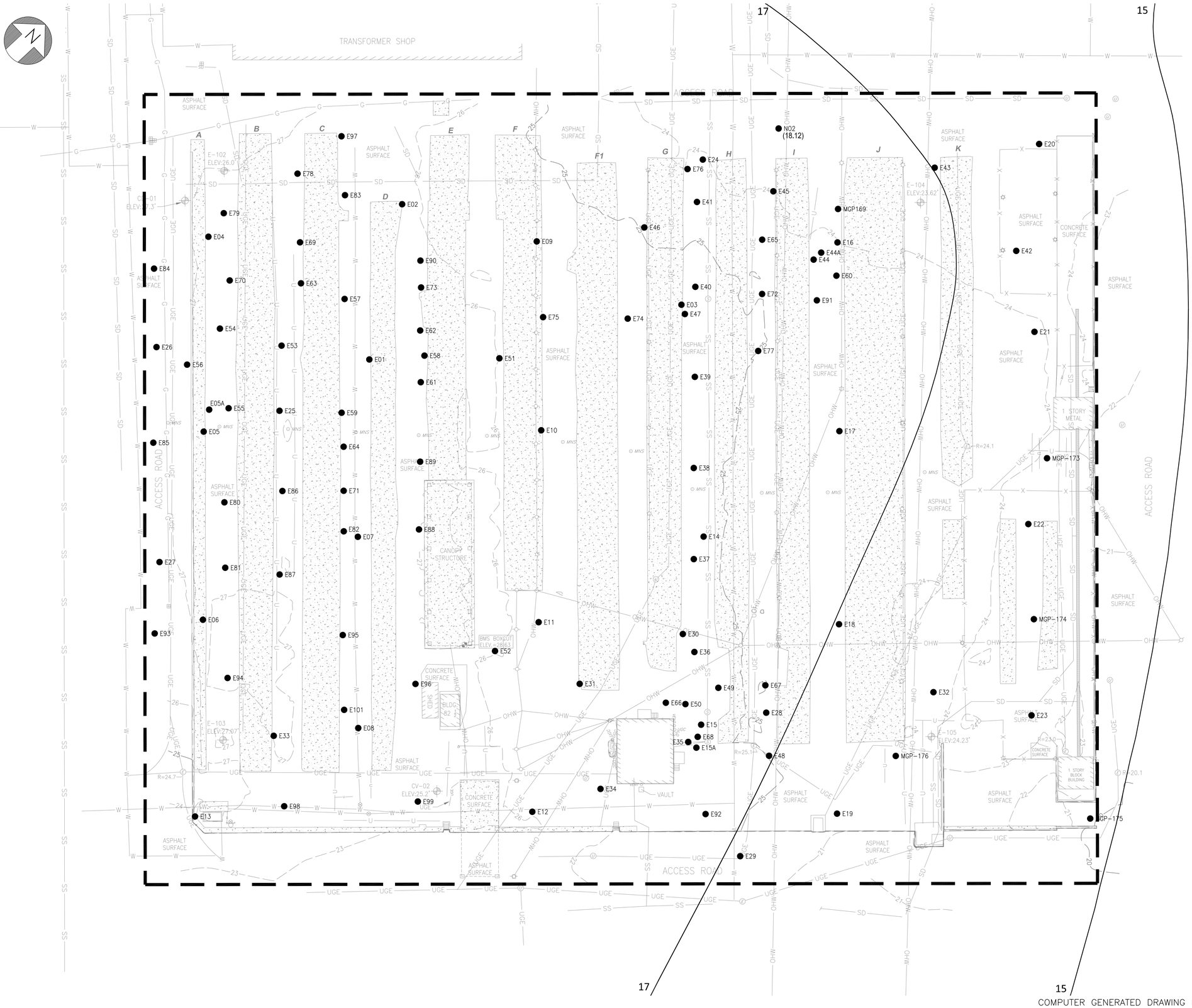

NOTES:

1. GROUNDWATER CONTOURS AND DATA TAKEN FROM FIGURE 3-2 OF AECOM REPORT TITLED "INTERIM CORRECTIVE MEASURES PLAN REMOVAL OF PCB-IMPACTED SOIL WITHIN THE EAST YARD SOLID WASTE MANAGEMENT UNIT (SWMU)", DATED JUNE 23, 2014.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (EAST ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

LEGEND:

15 — SHALLOW GROUNDWATER CONTOUR

● E74 — SAMPLE LOCATION

(18.12) — GROUNDWATER ELEVATION (FT.)(NAVD88)

EAST YARD

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507139-B

CON EDISON

DWG. TYPE: COMPANY

DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: BORING LOCATIONS AND GROUNDWATER CONTOURS

– APPROVALS –

ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	N.T.S.
DISCIPLINE CODE:	CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-004 | 6 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

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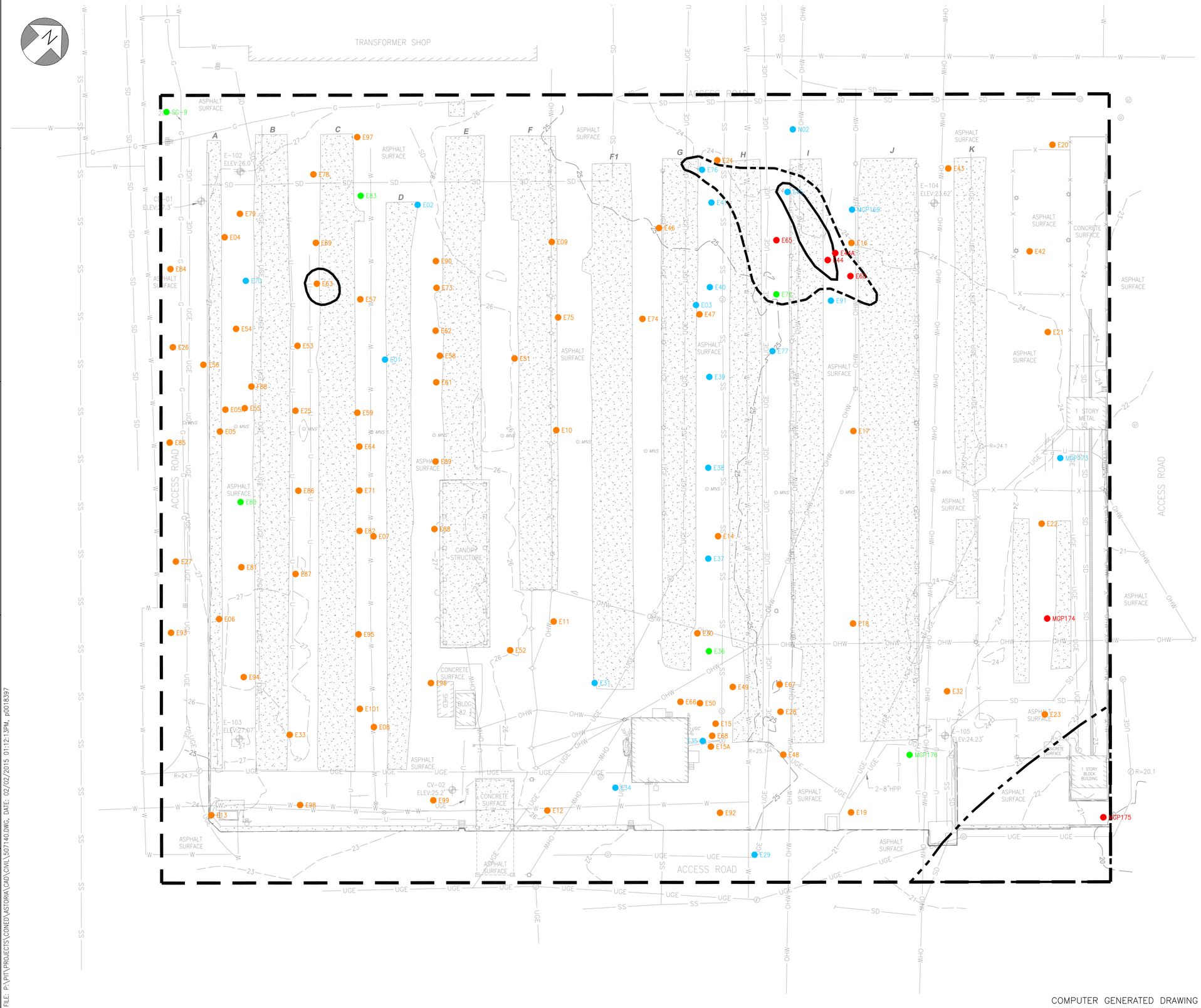


NOTES:

1. TPAH DATA AND VISIBLE MGP IMPACTS TAKEN FROM FIGURE 4-2 OF AECOM REPORT TITLED "INTERIM CORRECTIVE MEASURES PLAN REMOVAL OF PCB-IMPACTED SOIL WITHIN THE EAST YARD SOLID WASTE MANAGEMENT UNIT (SWMU)", DATED JUNE 23, 2014.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (EAST ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NAVD29).

LEGEND:

- E74 — SAMPLE LOCATION
- E65 — TPAHS > 500PPM
- NO2 — TPAHS < 500PPM
- E72 — TPAHS NOT DETECTED
- E42 — NO PAH SAMPLES COLLECTED
- SLIGHT TAR OR BLUE GREASY COATING
- STAIN
- APPROXIMATE EXTENT OF TAR SATURATION
- EAST YARD

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507140-B

CON EDISON — DWG. TYPE: COMPANY; DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: BORING LOCATIONS WITH TPH >500 PPM AND VISIBLE MGP IMPACTS

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: SMA

DESIGNER: RR

DRAWN BY: RR

SCALE: N.T.S. — DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/15/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-005 — 7 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507140.DWG, DATE: 02/02/2015 01:12:13PM, p001839?

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507141-B

CON EDISON

DWG. TYPE COMPANY
DWG. SIZE D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: REMEDIAL ACTION SITE PLAN

– APPROVALS –

ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: 1"=30'
DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

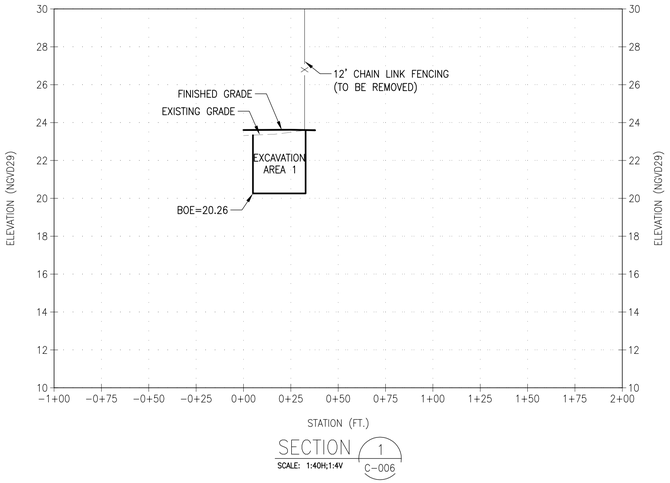
C-006 8 of 21

SCALE: 1" = 30'

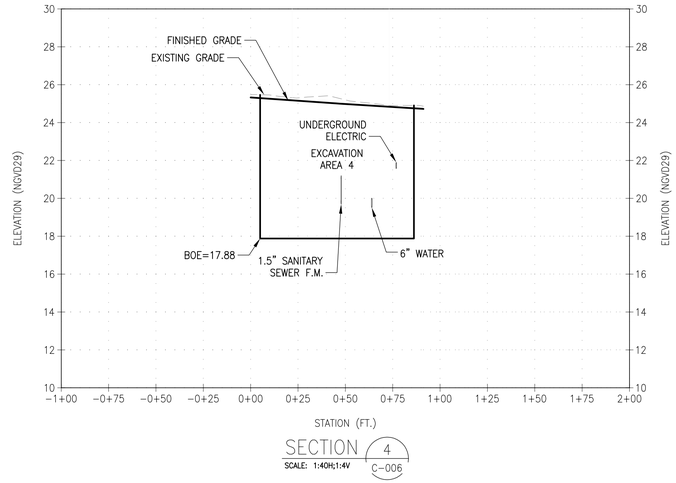
WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507141.DWG, DATE: 02/02/2015 01:26:10PM, p0018397



SECTION 1 C-006
SCALE: 1:40H;1:4V



SECTION 4 C-006
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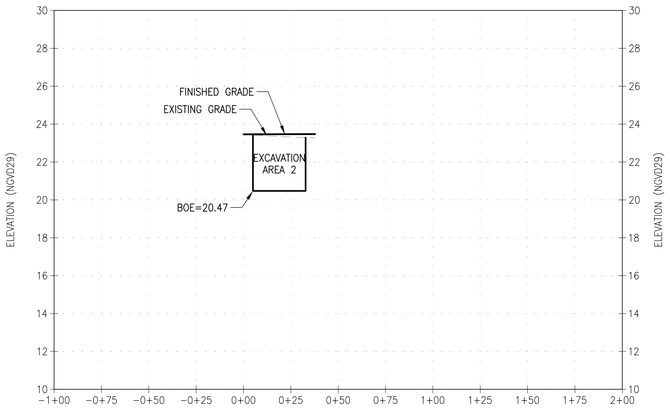

SECTION 2 C-006
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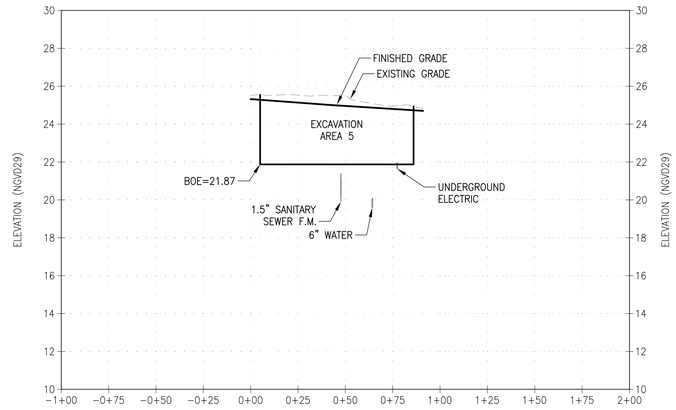
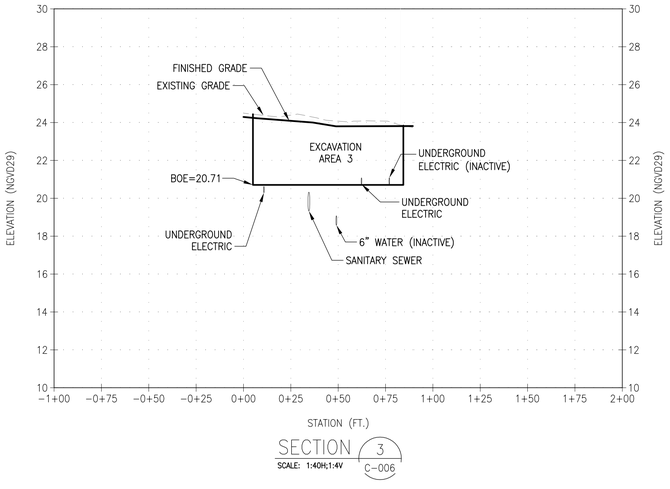
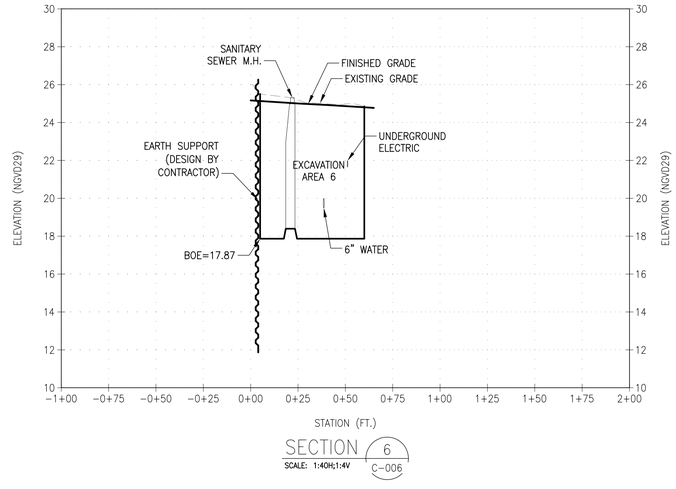


SECTION 5 C-006
SCALE: 1:40H;1:4V



SECTION 3 C-006
SCALE: 1:40H;1:4V



SECTION 6 C-006
SCALE: 1:40H;1:4V

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. VERTICAL EXCAVATION WALLS SHOWN ARE PER THE APPROVED INTERIM CORRECTIVE MEASURES REPORT.
5. EARTH SUPPORT LOCATIONS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. EARTH SUPPORT SHALL BE REQUIRED AS NECESSARY TO PROTECT THE CABLE YARD BUILDING, ACCESS ROAD, AND OTHER STRUCTURES AS MAY BE NECESSARY DURING CONSTRUCTION. EARTH SUPPORT DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PROPOSED DESIGNS SHALL BE REVIEWED AND APPROVED BY CON EDISON AND PARSONS.
6. SLOPED EXCAVATION SIDES ARE NOT SHOWN ON SECTIONS. CONTRACTOR MUST FOLLOW OSHA STANDARDS FOR EXCAVATIONS.
7. CONTRACTOR TO PROVIDE SHEETING AND SHORING DESIGN AND CALCULATIONS SIGNED AND SEALED BY A NYS PE.

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES		
REV	DES	ENG

DWG. NO. 507142-B

CON EDISON

DWG. TYPE COMPANY
DWG. SIZE D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: REMEDIAL ACTION SECTIONS (SHEET 1 OF 2)

– APPROVALS –

ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: 1:40H;1:4V
DISCIPLINE CODE: CV

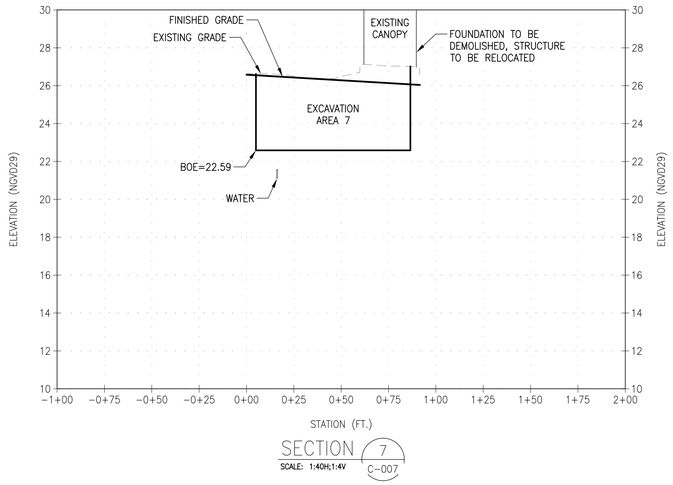
SEAL & SIGNATURE

DATE: 1/05/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

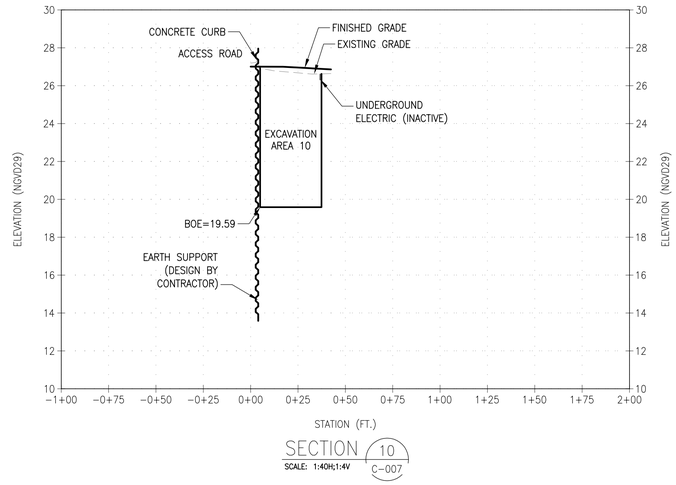
C-007 9 of 21

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

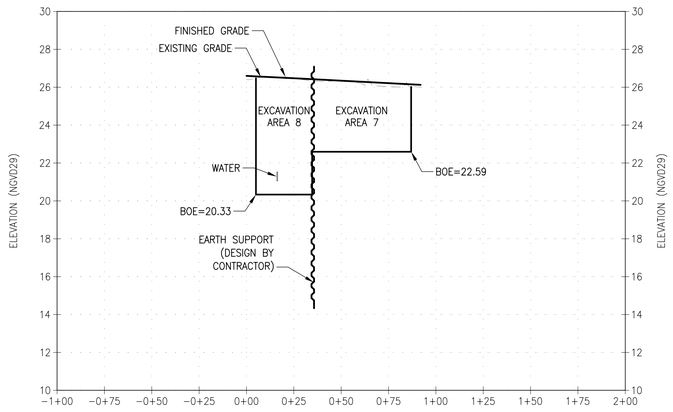
FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507142.DWG, DATE: 02/02/2015 01:32:21PM, p0018397



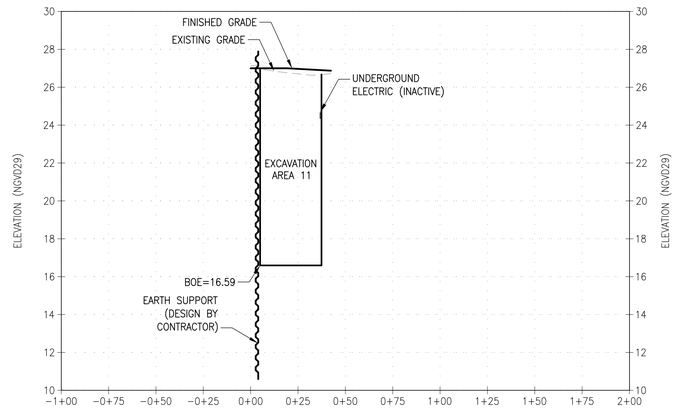
SECTION 7 (C-007)
SCALE: 1:40H;1:4V



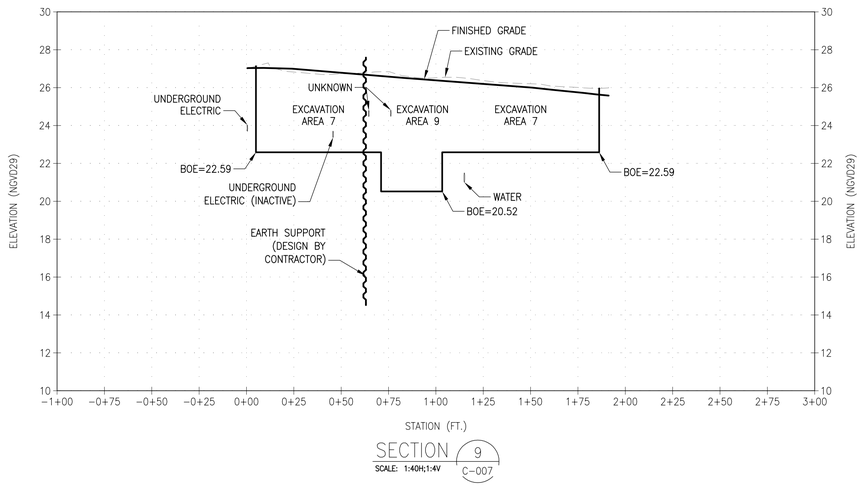
SECTION 10 (C-007)
SCALE: 1:40H;1:4V



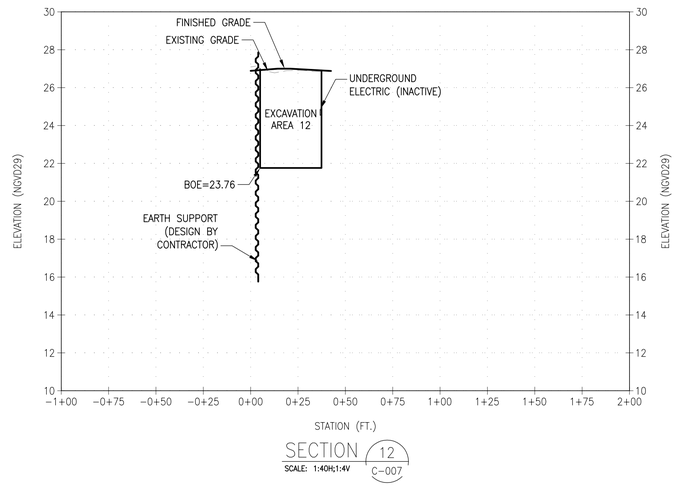
SECTION 8 (C-007)
SCALE: 1:40H;1:4V



SECTION 11 (C-007)
SCALE: 1:40H;1:4V



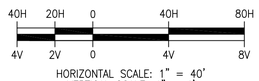
SECTION 9 (C-007)
SCALE: 1:40H;1:4V



SECTION 12 (C-007)
SCALE: 1:40H;1:4V

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. VERTICAL EXCAVATION WALLS SHOWN ARE PER THE APPROVED INTERIM CORRECTIVE MEASURES REPORT.
5. EARTH SUPPORT LOCATIONS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. EARTH SUPPORT SHALL BE REQUIRED AS NECESSARY TO PROTECT THE CABLE YARD BUILDING, ACCESS ROAD, AND OTHER STRUCTURES AS MAY BE NECESSARY DURING CONSTRUCTION. EARTH SUPPORT DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PROPOSED DESIGNS SHALL BE REVIEWED AND APPROVED BY CON EDISON AND PARSONS.
6. SLOPED EXCAVATION SIDES ARE NOT SHOWN ON SECTIONS. CONTRACTOR MUST FOLLOW OSHA STANDARDS FOR EXCAVATIONS.
7. CONTRACTOR TO PROVIDE SHEETING AND SHORING DESIGN AND CALCULATIONS SIGNED AND SEALED BY A NYS PE.



HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES		
REV	DES	ENG

DWG. NO. 507143-B

CON EDISON — DWG. TYPE: COMPANY; DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: REMEDIAL ACTION SECTIONS (SHEET 2 OF 2)

– APPROVALS –

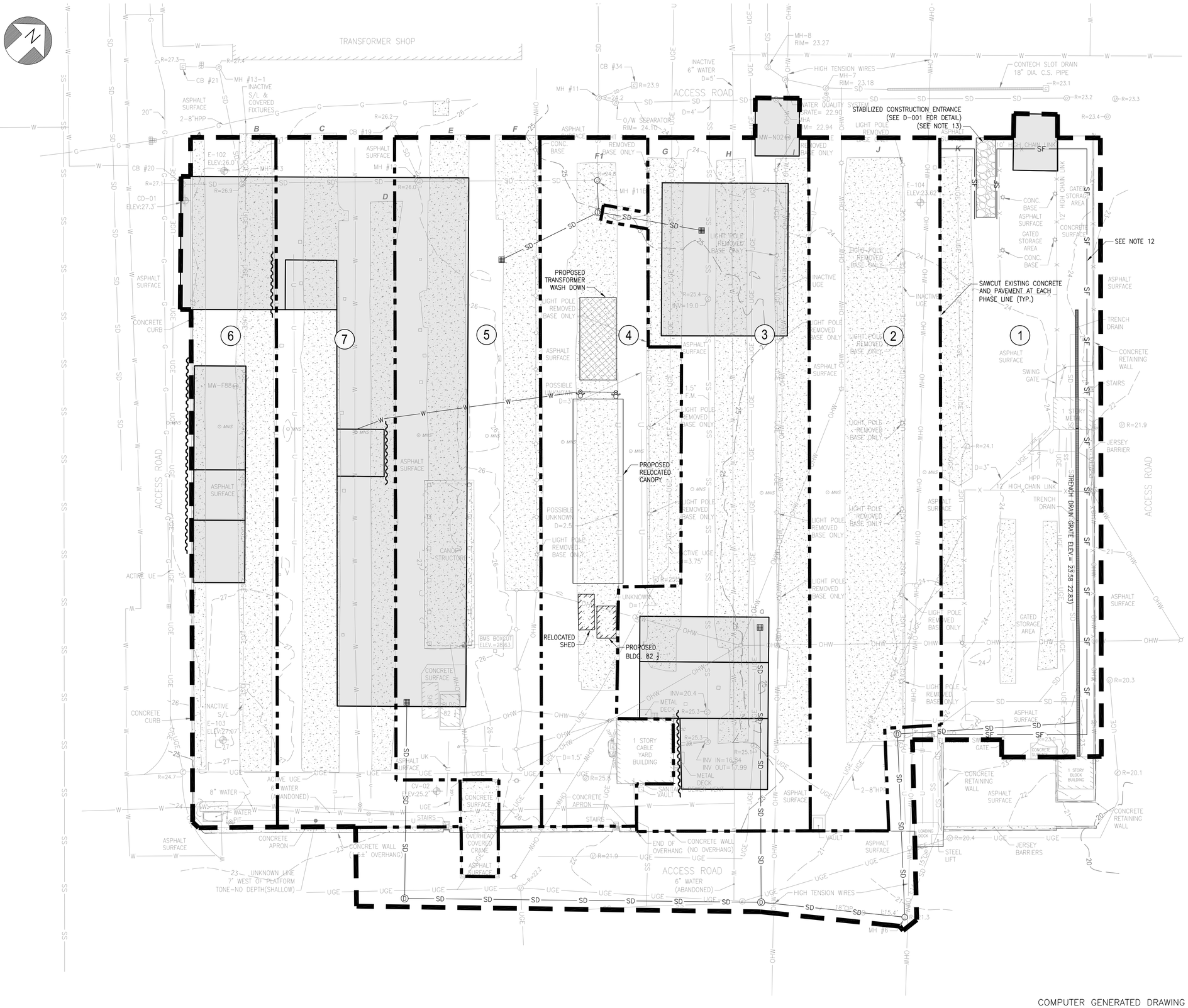
ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	1:40H;1:4V
DISCIPLINE CODE:	CV
SEAL & SIGNATURE	
DATE:	1/05/15
PROJECT No.:	449008-01000
DRAWING BY:	RR
CHK BY:	SMA
DOB DWG No:	

C-008 10 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507143.DWG, DATE: 02/02/2015 01:38:39PM, p0018397



NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. CONSTRUCTION TO PROCEED SEQUENTIALLY IN ACCORDANCE WITH THE FOLLOWING PHASES FROM PHASE 1 TO PHASE 7. CON EDISON SHALL RELOCATE EQUIPMENT SUCH THAT TWO (2) PHASES SHALL BE AVAILABLE TO THE CONTRACTOR.
5. CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH CON EDISON PERSONNEL TO ENSURE NO INTERRUPTION IN OPERATIONS.
6. CON EDISON PERSONNEL SHALL BE RESPONSIBLE TO MOVE AND RELOCATE TRANSFORMERS, CABLE ROLLS, SWITCH GEAR, ETC. CONTRACTOR SHALL NOT MOVE CON EDISON EQUIPMENT.
7. DURING CONSTRUCTION, AND IN PARTICULAR DURING PHASE 3 CONSTRUCTION, CONTRACTOR MUST MAINTAIN ACCESS AND OPERATIONS TO CABLE YARD OFFICE.
8. DURING CONSTRUCTION, AND IN PARTICULAR DURING PHASE 4 AND PHASE 5 CONSTRUCTION, CONTRACTOR SHALL MAINTAIN UNINTERRUPTED SERVICE TO BUILDING 82 ½ AND CANOPY AREA. PROPOSED BUILDING 82 ½ MUST BE FULLY FUNCTIONAL BEFORE DEMOLITION OF THE EXISTING BUILDING. ACTIVITIES UNDER EXISTING CANOPY STRUCTURE SHALL BE RELOCATED TO THE PROPOSED TRANSFORMER WASH DOWN SHELTER PRIOR TO DISMANTLING THE EXISTING CANOPY STRUCTURE.
9. OVERHEAD CRANE AND FORK TRUCK ACCESS SHALL BE COORDINATED WITH CON EDISON AND MAINTAINED THROUGHOUT ALL PHASES OF CONSTRUCTION.
10. ALL ACTIVITIES IN ACCESS ROADS MUST BE COORDINATED WITH CON EDISON TO MINIMIZE DISRUPTIONS TO SITE ACTIVITIES.
11. EROSION CONTROLS SHALL REMAIN IN PLACE UNTIL THE FINAL CONCRETE IS PLACED.
12. SILT FENCE SHALL BE PROVIDED ON ALL DOWN GRADIENT SIDES OF EACH ACTIVE PHASE. SILT FENCE SHOWN IS FOR GUIDANCE PURPOSES ONLY.
13. STABILIZED CONSTRUCTION ENTRANCE SHOWN FOR GUIDANCE PURPOSES ONLY. CONTRACTOR SHALL DETERMINE ACTUAL LOCATION AT THE COMMENCEMENT OF EACH PHASE.

LEGEND:

- PROPOSED PHASING LIMITS
- PROPOSED LIMITS OF WORK
- (4) PROPOSED PHASING SEQUENCE NUMBER

30 15 0 30 60

SCALE: 1" = 30'

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507144-B

CON EDISON
DWG. TYPE COMPANY
DWG. SIZE D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: CONSTRUCTION PHASING PLAN

– APPROVALS –

ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	1"=30'
DISCIPLINE CODE:	CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-009 11 of 21

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507144.DWG, DATE: 02/02/2015 01:51:48PM, p001839?

NOTES:

1. SEE DRAWING G-002 FOR GENERAL NOTES AND LEGEND.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. ALL MANHOLE RIMS WITHIN THE PROPOSED LIMITS OF WORK SHALL BE ADJUSTED WITH THE PLACEMENT OF THE FINAL SURFACE.

REVISION
USE .1 SIZE TEXT ONLY

TRANSFORMER SHOP
ACCESS ROAD
DMH #11B=24.8
18" HDPE INV. IN=20.52
18" HDPE INV. OUT=18.30
AUTOMATED SHUT-OFF VALVE TO OUTFALL B
PROPOSED CB E4
RIM=24.15
18" HDPE INV OUT=19.03
PROPOSED CB E3
RIM=25.38
12" HDPE INV=19.60
PROPOSED DMH E5
RIM=24.70
12" HDPE INV IN=20.52
18" HDPE INV IN=20.52
18" HDPE INV OUT=20.68
PROPOSED TRANSFORMER WASH DOWN
RIM TO BE ADJUSTED
CURBING TO BE REPLACED
PROPOSED 1" COPPER LINE CURB STOP AND CORPORATION
WET TAP EXISTING WATER LINE
PROPOSED 2-1" YARD HYDRANTS
PROPOSED RELOCATED CANOPY
PROPOSED CB E1
RIM=24.90
18" HDPE INV OUT=20.40
RELOCATED SHED
PROPOSED BLDG. 82 ½
PROPOSED CB E2
RIM=26.08
12" HDPE INV OUT=18.68
CURB TOP ONLY TO BE REPLACED
PROPOSED DMH E2
RIM=24.23
18" HDPE INV IN= 17.10
18" HDPE INV OUT=17.10
PROPOSED TD E1
18" HDPE INV OUT=17.58
PROPOSED DMH E3
RIM=22.59
12" HDPE INV IN=17.92
12" HDPE INV OUT= 17.92
PROPOSED DMH E1
RIM=21.20
12" HDPE INV IN=16.80
18" HDPE INV IN=16.30
18" HDPE INV OUT=16.30
DMH #6 (EXISTING)
RIM=23.28
18" HDPE INV IN=15.95
18" HDPE INV IN=15.85
18" HDPE INV OUT=15.85
TO OUTFALL G
PORTION OF EXISTING SECONDARY LIQUID STORAGE AREA TO REMAIN
CURB TOP ON WALL TO BE REPAIRED
REMOVE, STORE, AND RE-INSTALL EXISTING STORAGE RACKS
CONTECH SLOT DRAIN 18" DIA. C.S. PIPE
WATER QUALITY SYSTEM GRATE= 22.90 MHA RIM= 22.94
O/W SEPARATOR RIM= 24.10
HIGH TENSION WIRES
INACTIVE 6" WATER D=5'
INACTIVE S/L & COVERED FIXTURES
1 STORY CABLE YARD BUILDING
SANITARY SEWER VENT
OVERHEAD COVERED CRANE
STEEL LIFT
JERSEY BARRIERS
TRENCH DRAIN GRATE ELEV= 23.58 22.83)
SCALE: 1" = 30'

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507145-B

CON EDISON

DWG. TYPE: COMPANY
DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: PROPOSED SITE PLAN

– APPROVALS –

ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: 1"=30'
DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

C-010 12 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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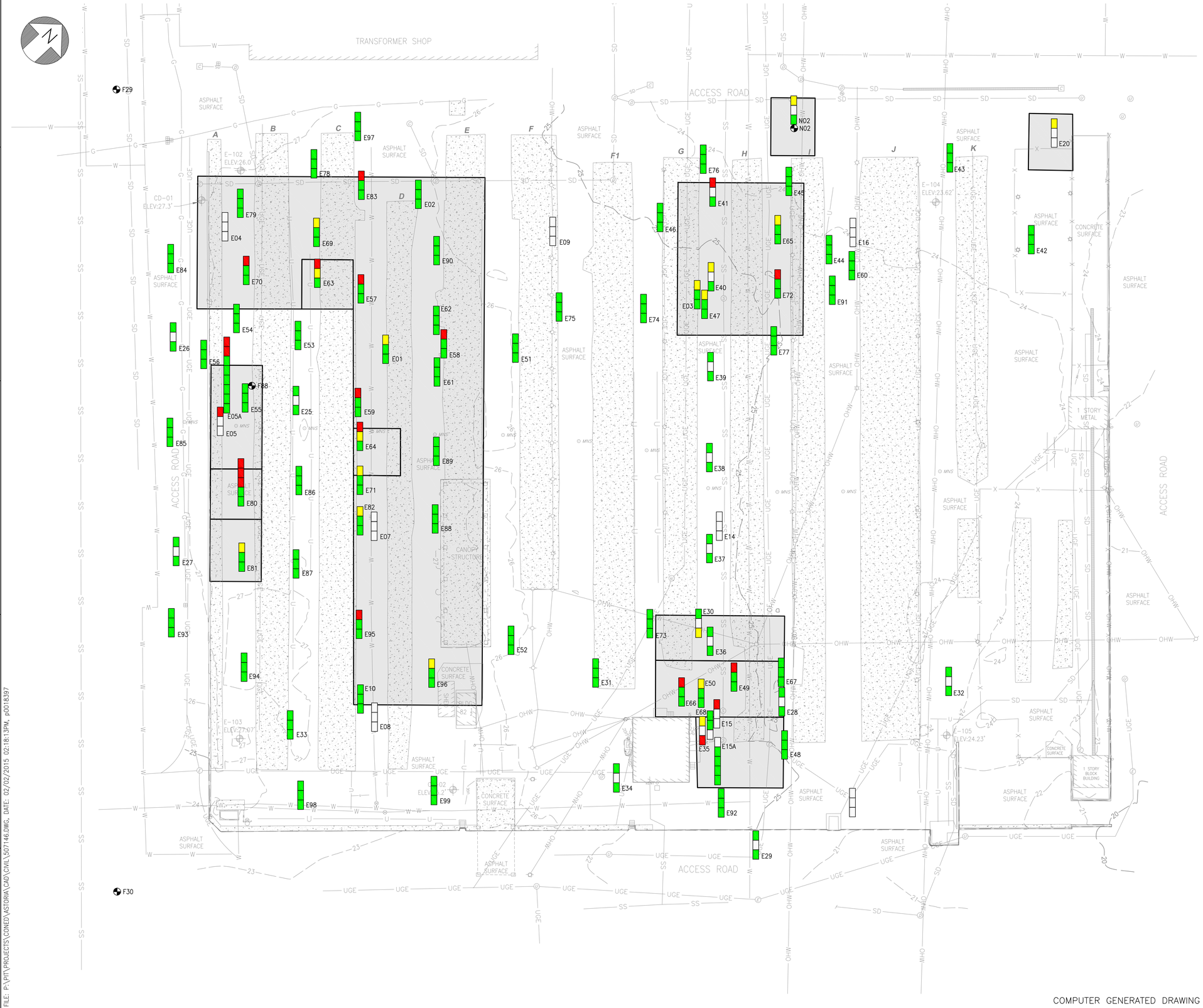


NOTES:

1. PCB DATA IMPACTS TAKEN FROM FIGURE 4-1 OF AECOM REPORT TITLED "INTERIM CORRECTIVE MEASURES PLAN REMOVAL OF PCB-IMPACTED SOIL WITHIN THE EAST YARD SOLID WASTE MANAGEMENT UNIT (SWMU)", DATED JUNE 23, 2014.
2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (EAST ZONE) COORDINATE SYSTEM.
3. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
4. EXCAVATION VOLUMES ARE BASE ON VERTICAL SIDEWALLS.

LEGEND:

- ≤25 PPM
- >25 ≤100 PPM
- >100 PPM
- NOT SAMPLED
- PROPOSED LIMITS OF EXCAVATION
- MONITORING WELL LOCATION
- SHALLOWEST
- MIDPOINT
- DEEPEST

30 15 0 30 60

SCALE: 1" = 30'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507146-B

CON EDISON

DWG. TYPE: COMPANY
DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: BORING LOCATIONS WITH PCB RESULTS

– APPROVALS –

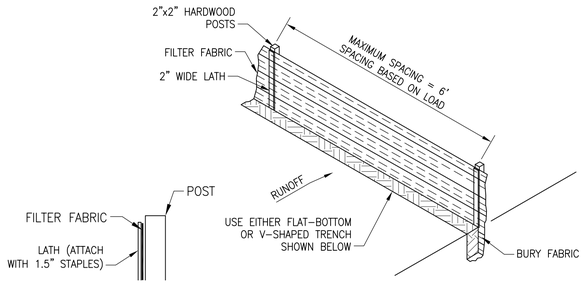
ENGINEERING MANAGER: JD
PROJECT ENGINEER: SMA
DESIGNER: RR
DRAWN BY: RR
SCALE: N.T.S.
DISCIPLINE CODE: CE

SEAL & SIGNATURE

DATE: 1/15/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

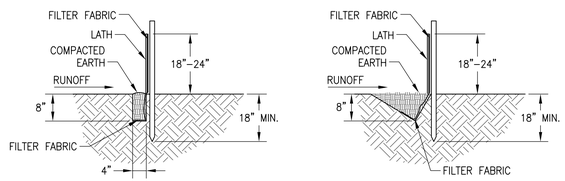
C-011 13 of 21

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507146.DWG, DATE: 02/02/2015 02:18:13PM, p0018397



FABRIC ATTACHMENT DETAIL

SILT-FENCE INSTALLATION

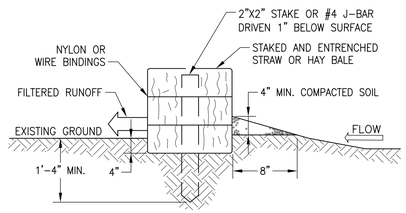


FLAT-BOTTOM TRENCH DETAIL

V-SHAPED TRENCH DETAIL

SILT FENCE

N.T.S.

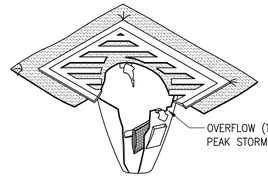


STRAW BALE BARRIER NOTES:

1. PLACE BALES IN 4" DEEP TRENCH ALONG THE CONTOUR OF THE SLOPE IN THE SHAPE OF AN ARC WITH THE ENDS UPHILL OF THE ARCS CENTER. BALES SHALL BE PLACED SO THAT BINDINGS ARE HORIZONTAL. MAXIMUM SPACING BETWEEN BALE ROWS SHALL BE 100 FEET.
2. BALES SHALL BE ANCHORED BY TWO 2"x2" STAKES OR #4 J-BAR DRIVEN THROUGH THE BALE AND INTO THE GROUND A MINIMUM DEPTH OF ONE FOOT. STAKES OR J-BARS SHALL BE DRIVEN 1" OR MORE BELOW THE SURFACE OF THE BALE. THE FIRST STAKE OR J-BAR IN EACH BALE SHALL BE DRIVEN AT AN ANGLE TOWARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TIGHTLY TOGETHER.
3. AFTER BALES ARE STAKED IN PLACE, EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE UPHILL SIDE TO A MINIMUM HEIGHT OF 4 INCES.
4. CONTRACTOR SHALL MAKE PERIODIC INSPECTIONS TO DETERMINE IF REPAIRS OR SEDIMENT REMOVAL IS REQUIRED. SEDIMENT SHALL BE REMOVED WHEN IT HAS BUILT UP TO A DEPTH OF ONE HALF THE BALE HEIGHT.
5. BALES SHALL BE REPLACED WHEN THEY HAVE BEEN DAMAGED, COLLAPSED OR DECOMPOSED.

HAYBALE

N.T.S

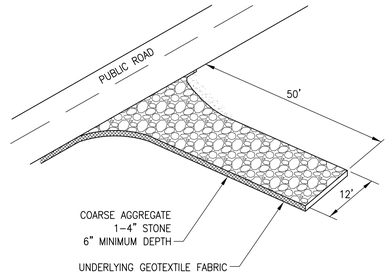


NOTES:

1. STORM DRAIN INLETS NEED TO BE REMOVED AT THE END OF THE WORK.
2. 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.
3. 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.

FILTER FABRIC INLET PROTECTION

N.T.S

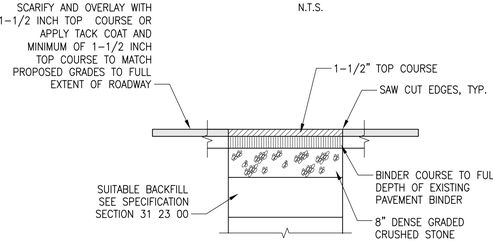


NOTES:

1. DETAIL IS PROVIDED FOR MAINTENANCE OF THE EXISTING CONSTRUCTION ENTRANCE.
2. INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.
3. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OF BASIN OR OTHER SEDIMENT TRAPPING STRUCTURE.

STABILIZED CONSTRUCTION ENTRANCE

N.T.S.

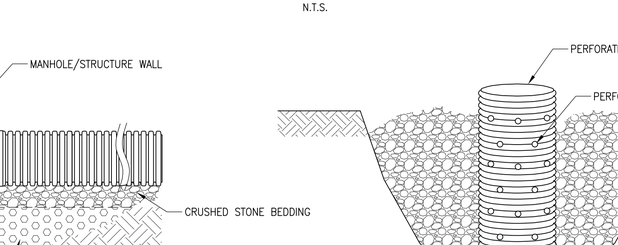


NOTES:

1. CONCRETE STRUCTURE TO BE DESIGNED FOR AASHTO H-20 LOADING.
2. STANDARD CATCH BASIN SHALL BE 4-FOOT DIAMETER UNLESS FIELD CONDITIONS REQUIRE THE NEED FOR A DIFFERENT SIZE. DEVIATIONS FROM 4-FOOT DIAMETER CATCH BASINS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

CATCH BASIN

N.T.S.

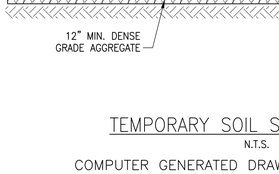


NOTE:

1. SEE NOTES ON SHEETS 376975 TO 376979 FOR SPECIFIC MANHOLE SIZES.
2. CONCRETE STRUCTURE TO BE DESIGNED FOR AASHTO H-20 LOADING.

DRAINAGE MANHOLE

N.T.S.



12" TO 24"

PIPE SIZE (IN)	PIPE OD (IN)	NPC PIPE ADAPTER	KOR-N-SEAL	
			SERIES I OR II	SERIES 306
12	14.5	CGA-12	S106-20BWS	N/A
15	17.6	CGA-15	S206-20L	S306-22
18	21.2	CGA-18	S206-24L	S306-24L
24	28.1	CGA-24	S206-32	S306-32
30*	35.4	N/A	S206-38L	S306-38L
36*	41.1	N/A	S206-44L	S306-44L
42*	47.2	N/A	S206-52	N/A

* LARGER THAN 24-INCH SANITITE HP PIPE SHALL HAVE A SMOOTH EXTERIOR. NO NPC PIPE ADAPTER IS REQUIRED.

NOTES:

1. PERFORMANCE HIGHLY DEPENDENT ON INSTALLATION. CONTRACTOR MUST ENSURE THAT WATERTIGHT CONNECTOR (KOR-N-SEAL) IS UNIFORMLY SEATED AROUND STRUCTURE OPENING. EXTRA PRECAUTIONS MUST BE TAKEN TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN THE PIPE AND MANHOLE.

WATERTIGHT CONNECTION

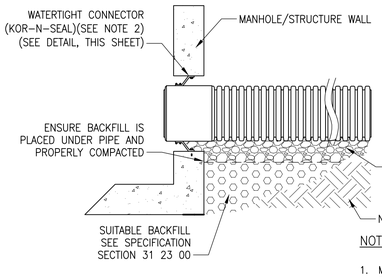
N.T.S.

NOTES:

1. WORK CONDUCTED WITH SPECIFICATION SECTION 32 12 16 BITUMINOUS PAVEMENT.
2. FOR ROADWAY GRADING SEE SHEET 376982.

PAVEMENT PATCH

N.T.S



NOTES:

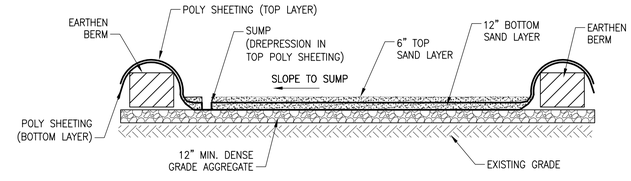
1. MAXIMUM INSERTION ANGLE NOT TO EXCEED REQUIREMENTS AS SPECIFIED BY PRECAST MANHOLE MANUFACTURER.
2. CONTRACTOR SHALL ENSURE THAT WATERTIGHT CONNECTOR (KOR-N-SEAL) IS UNIFORMLY SEATED AROUND STRUCTURE OPENING.

PIPE TO MANHOLE CONNECTION

N.T.S.

TEMPORARY DRAINAGE SUMP

N.T.S.



TEMPORARY SOIL STOCKPILE PAD

N.T.S.

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507147-B

CON EDISON

DWG. TYPE COMPANY

DWG. SIZE D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: DETAILS SHEET

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: SMA

DESIGNER: RR

DRAWN BY: RR

SCALE: N.T.S.

DISCIPLINE CODE: CE

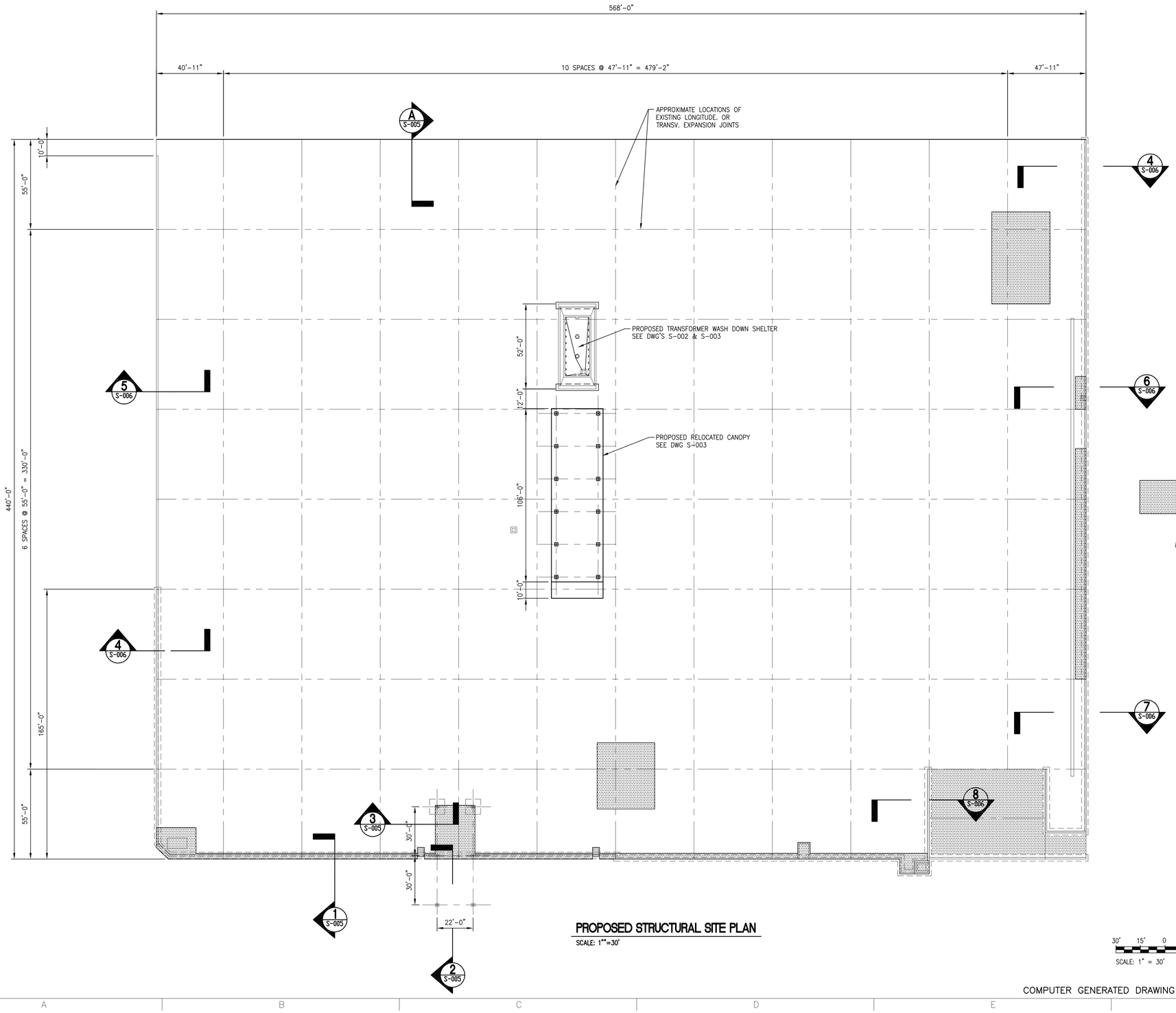
SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

D-001

14 of 21

FILE: P:\PIT\PROJECTS\CONED\ASTORIA\CAD\CIVIL\507147.DWG, DATE: 02/02/2015 02:25:30PM, p0018397



PROPOSED STRUCTURAL SITE PLAN

SCALE: 1"=30'

30' 15' 0 15' 30' 60'

SCALE: 1" = 30'

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507148-B

CON EDISON

DWG. TYPE COMPANY

DWG. SIZE D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: PROPOSED STRUCTURAL SITE PLAN

– APPROVALS –

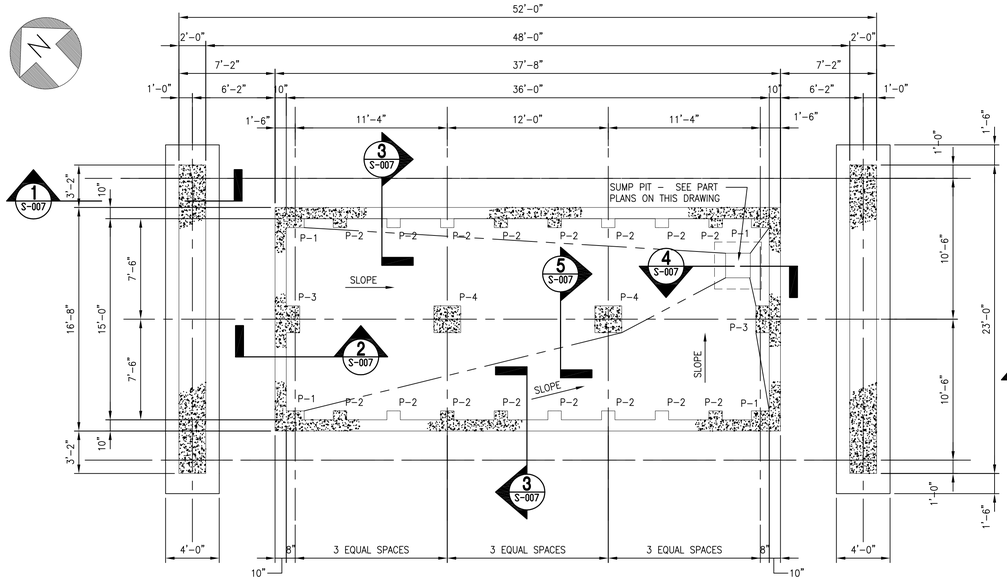
ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	DRY
DESIGNER:	JBD
DRAWN BY:	JBD
SCALE:	AS NOTED.
DISCIPLINE CODE:	ST

SEAL & SIGNATURE

DATE: 01/07/15
PROJECT No.: 449006-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:

S-001 15 of 21

FILE: J:\PROJECTS\CONED\ASTORIA\CAD\STRUC\507148.DWG, DATE: 02/02/2015 03:05:32PM, p0010763

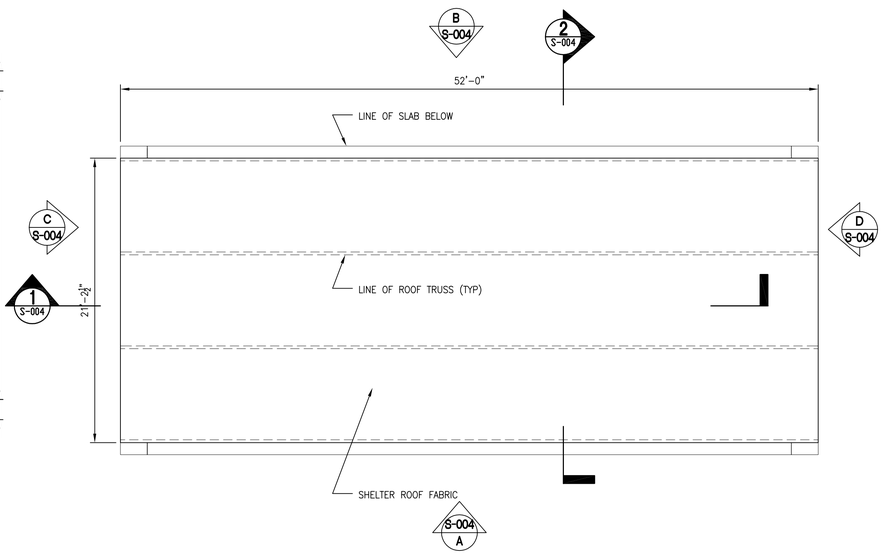


TRANSFORMER WASH DOWN SHELTER FOUNDATION PLAN

SCALE: 3/16"=1'-0"

NOTE:

P-1 ON PLAN INDICATES PIER TYPE. REFER TO DRAWING 507154 FOR REINFORCING DETAILS.



TRANSFORMER WASH DOWN SHELTER ROOF PLAN

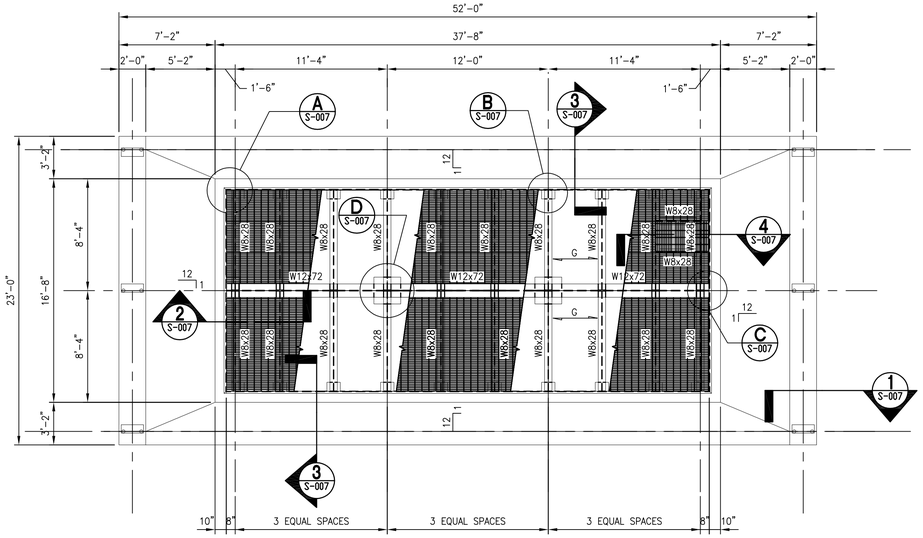
SCALE: 3/16"=1'-0"

CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE PERFORMED IN ACCORDANCE WITH CON EDISON STANDARD SPEC'S: CE-SS-3400-03000 AND CE-SS-3400-03300.
2. NO CONCRETE SHALL BE PLACED IN WATER OR ON FROZEN GROUND. IF NECESSARY, A DEWATERING PROGRAM SHALL BE DEPLOYED.
3. THE NEW CONCRETE FLOOR SLAB AND CONTAINMENT SHALL BE WET CURED WITH BURLAP KEPT CONTINUOUSLY WET FOR THE ENTIRE CURING PERIOD. OTHER CURING METHODS, SUCH AS SPRAY APPLIED CURING COMPOUNDS OR COVERS SHALL NOT BE USED.
4. CONCRETE WORK SHALL BE PROTECTED AGAINST FROST UNTIL PROJECT IS COMPLETED.
5. CONCRETE SHALL BE AIR ENTRAINED (4% TO 6%) WITH A MINIMUM COMPRESSIVE STRENGTH OF f'c = 5,000 PSI AT 28 DAYS AND MAXIMUM WATER/CEMENT RATIO OF 0.45 BY WEIGHT.
6. IN THE EVENT GROUND WATER IS ENCOUNTERED THE CONTRACTOR SHALL CONTROL SURFACE AND SUBSURFACE WATER DURING CONSTRUCTION SO THAT CONCRETE WORK WILL BE DONE IN DRY AND UNDISTURBED SOILS.
7. FURNISH AND PLACE ALL SUPPORTS, TEMPORARY OR PERMANENT, WHETHER SHORING, SHEETING OR BRACING SO THAT NO HORIZONTAL MOVEMENT OR VERTICAL SETTLEMENT OCCURS TO EXISTING STRUCTURES OR UTILITIES ADJACENT YO NEW CONCRETE WORK.
8. PROVIDE FLEXCELL JOINT FILLER, BY KNIGHT-CELOTEX OR APPROVED EQUIVALENT, AT ALL JOINTS IN CONCRETE WORK.
9. PROVIDE JOINT ELASTOMERIC SEALANT SIKAFLEX-2c SL, BY SIKA CORP. OR APPROVED EQUIVALENT, AT ALL JOINT IN CONCRETE WORK.
10. ALL FORMWORK AND PLACEMENT PLACEMENT SHALL COMPLY WITH GOOD CONSTRUCTION PRACTICES AND BE IN ACCORDANCE WITH ALL LOCAL GOVERNING CODES AND REGULATIONS AS WELL AS ACI 347-04.
11. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ¾".
12. ALL REINFORCING BARS SHALL BE DEFORMED AND CONFORMING TO ASTM A615, EPOXY COATED, 60,000 PSI MINIMUM YIELD STRENGTH.
13. THE GAPS UNDER BASE PLATES INSTALLED ON CONCRETE SURFACES SHALL BE FILLED WITH NON-SHRINK, NON-METALIC GROUT.
14. INSTALL CONCRETE OVERLAY ON THE BOTTOM OF CONTAINMENT TO ORGANIZE A 1% PITCH TOWARD THE SUMP. USE "FIVE STAR STRUCTURAL CONCRETE ES" BY FIVE STAR PRODUCTS, INC. MINIMUM THICKNESS (DEPTH) OF OVERLAY IS ½". MAXIMUM THICKNESS 5".
15. INTERIOR SURFACES OF THE CONCRETE CONTAINMENT SHALL BE PRIMED WITH SEMSTONE 110/110 EP AND COATED WITH SEMSTONE 140 EPOXY LINING SYSTEM BY CARBOLINE CO. ALL WORK SHALL BE DONE IN ACCORDANCE CARBOLINE INSTALLATION GUIDELINES AND PROJECT SPECIFICATION FME-031-09.

STEEL NOTES:

1. ALL STRUCTURAL STEEL W SHAPES SHALL CONFORM TO ASTM A992. OTHER SHAPES AND PLATES SHALL CONFORM TO ASTM A36 OR BETTER.
2. ALL STRUCTURAL STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED CONFORMING TO ASTM A123 AND A153 RESPECTIVELY.
3. ALL BOLTS SHALL BE ¾"ø HIGH STRENGTH BOLTS ASTM A325 AND HAVE ONE (1) WASHER UNDER THE HEAD AND ONE (1) WASHER UNDER THE NUT. BOLTS TO BE TORQUED SNUG TIGHT.
4. ALL WELDING ELECTRODES SHALL CONFORM TO AWS D1.1 SPECIFICATIONS, CLASS E70XX SERIES.
5. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS.
6. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC SPECIFICATIONS, LATEST EDITION.
7. ALL GRATING PANELS SHALL BE BANDED.
8. ALL STEEL WORK SHALL CONFORM TO CON EDISON STANDARD SPECIFICATIONS CE-SS-3400-5100 AND CE-SS-3400-5500.

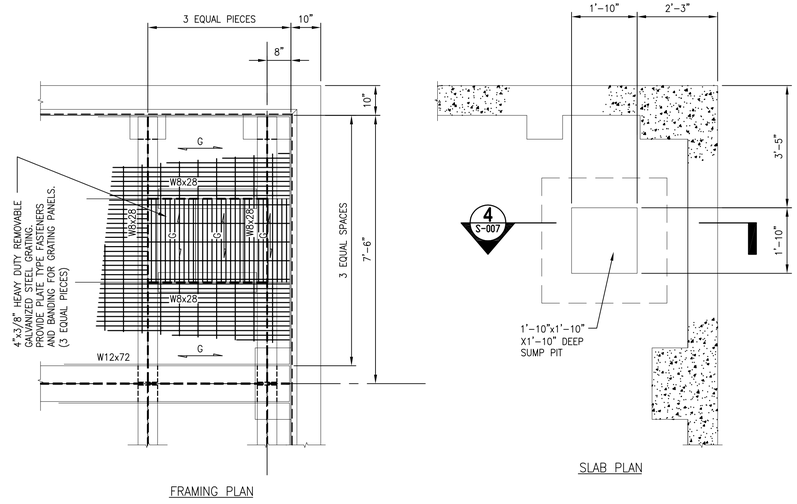


TRANFORMER WASH DOWN SHELTER FRAMING PLAN

SCALE: 3/16"=1'-0"

NOTE:

G ON PLAN INDICATES SPAN DIRECTION OF 4" x ⅜" HEAVY DUTY GALVANIZED STEEL GRATING.



FRAMING PLAN

SLAB PLAN

PART PLANS AT SUMP PIT

SCALE: 1/2"=1'-0"

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507149-B

CON EDISON

DWG. TYPE: COMPANY

DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: TRANSFORMER WASH DOWN SHELTER PLANS

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: DRY

DESIGNER: JBD

DRAWN BY: JBD

SCALE: AS NOTED. DISCIPLINE CODE: ST

SEAL & SIGNATURE

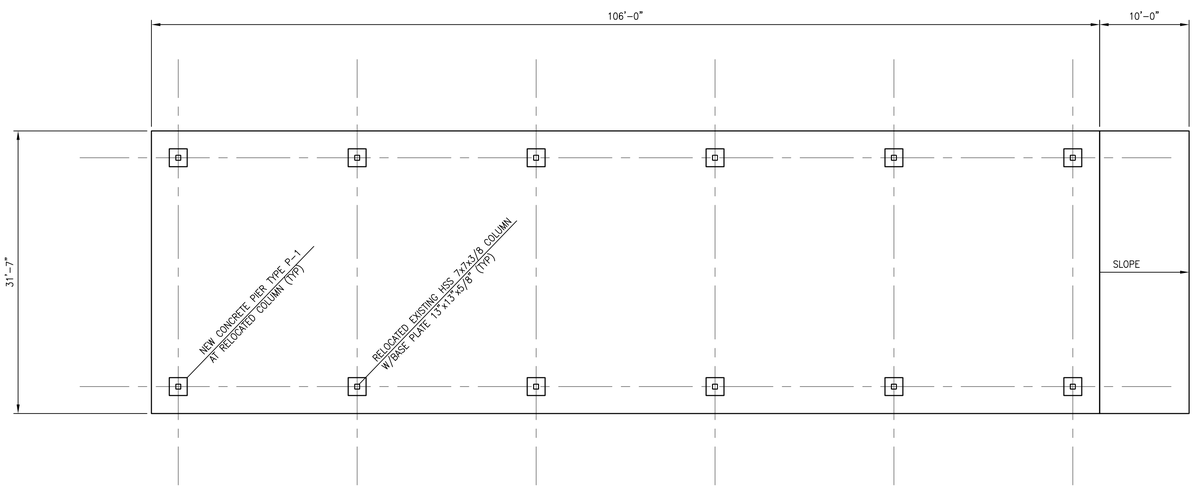
DATE: 01/07/15
PROJECT No.: 449006-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:

S-002 16 of 21

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: J:\PROJECTS\CONED\ASTORIA\CAD\STRUC\507149.DWG, DATE: 02/02/2015 03:08:02PM, p0010763

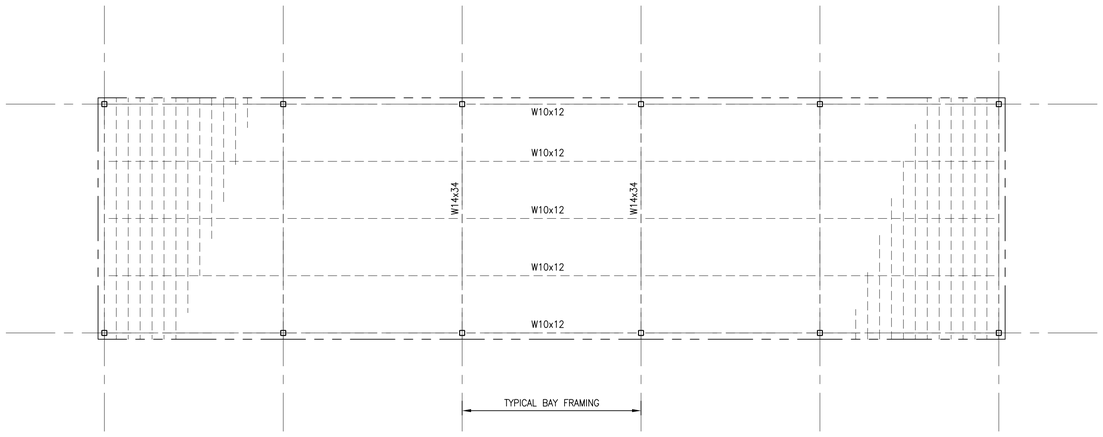


RELOCATED CANOPY FOUNDATION PLAN

SCALE: 1/8"=1'-0"

NOTE:

P-1 ON PLAN INDICATES PIER TYPE.



RELOCATED CANOPY ROOF FRAMING PLAN

SCALE: 1/8"=1'-0"

NOTE:

⟵⟶ ON PLAN INDICATES SPAN DIRECTION OF NEW " x GA. METAL ROOF DECK.

ALL STEEL FRAMING MEMBERS SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED ON PLAN.

8' 4' 0 4' 8' 16'

SCALE: 1/8" = 1'-0"

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507150-B

CON EDISON

DWG. TYPE COMPANY

DWG. SIZE D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: RELOCATED CANOPY PLANS

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: DRY

DESIGNER: JBD

DRAWN BY: JBD

SCALE: AS NOTED.

DISCIPLINE CODE: ST

SEAL & SIGNATURE

DATE: 01/07/15

PROJECT No.: 449006-01000

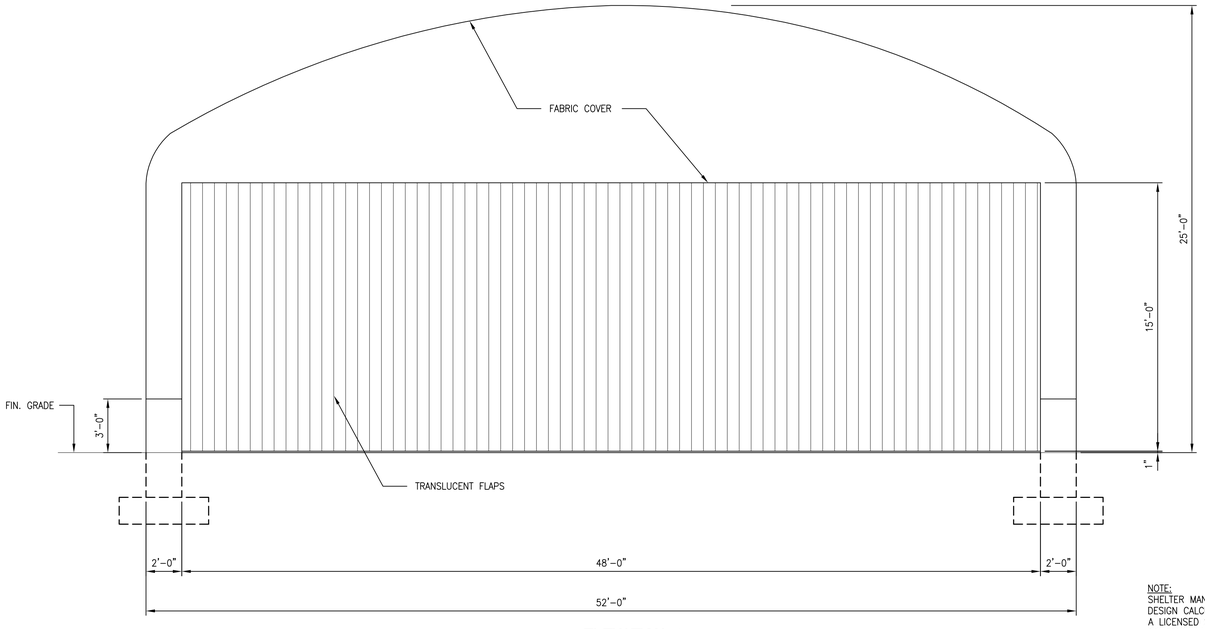
DRAWING BY: JBD

CHK BY: DRY

DOB DWG No:

S-003

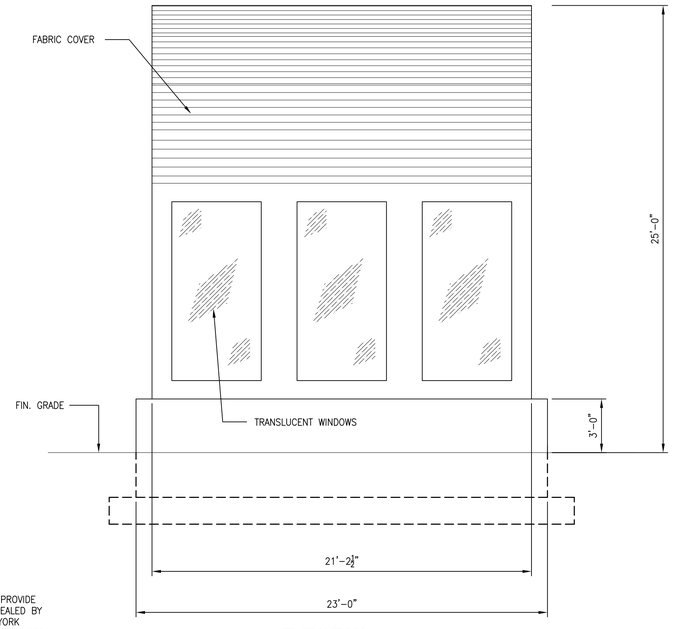
17 of 21



A S-003 **ELEVATION** (AS SHOWN)
SCALE: 1/4"=1'-0"

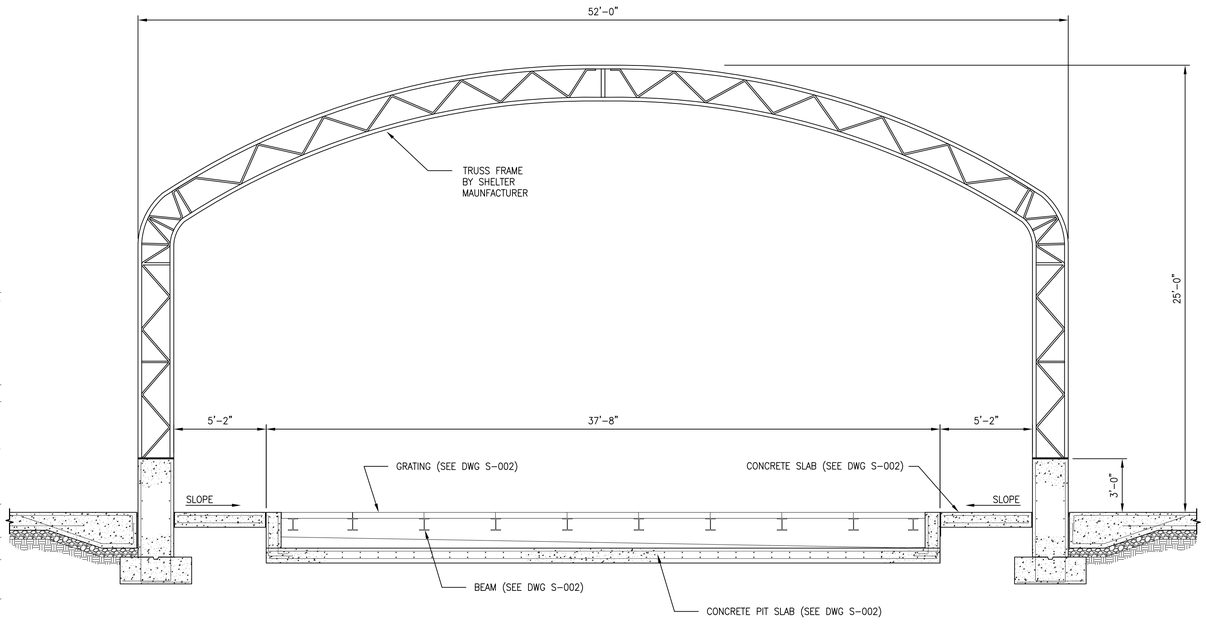
B S-003 **ELEVATION** (OPP. HAND)
SCALE: 1/4"=1'-0"

NOTE:
SHELTER MANUFACTURER TO PROVIDE DESIGN CALCULATIONS AND SEALED BY A LICENSED STATE OF NEW YORK PROFESSIONAL ENGINEER FOR SHELTER AND ANCHORAGE

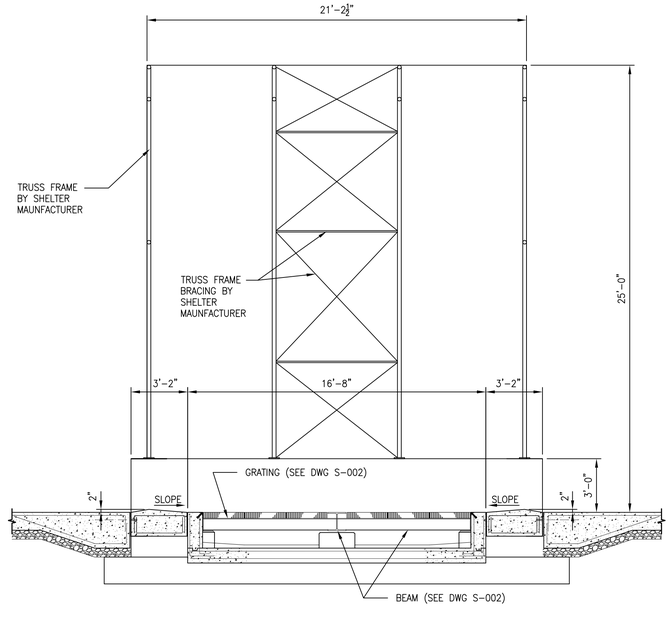


C S-003 **ELEVATION** (AS SHOWN)
SCALE: 1/4"=1'-0"

D S-003 **ELEVATION** (OPP. HAND)
SCALE: 1/4"=1'-0"



1 S-003 **SECTION**
SCALE: 1/4"=1'-0"



2 S-003 **SECTION**
SCALE: 1/4"=1'-0"

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

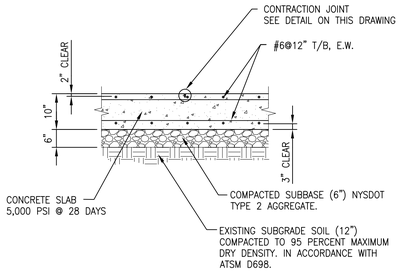
WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

REVISION
USE .1 SIZE TEXT ONLY

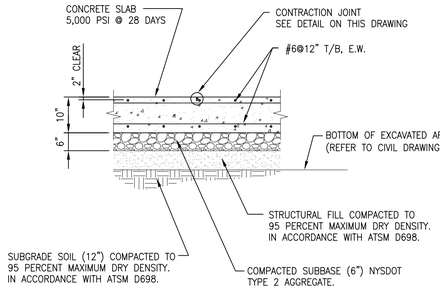
REVISION SIGNATURES		
REV	DES	ENG

DWG. NO. 507151-B
CON EDISON
DWG. TYPE COMPANY
DWG. SIZE D
LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: TRANSFORMER
WASH DOWN SHELTER
ELEVATIONS & SECTIONS
– APPROVALS –
ENGINEERING MANAGER: JD
PROJECT ENGINEER: DRY
DESIGNER: JBD
DRAWN BY: JBD
SCALE: AS NOTED.
DISCIPLINE CODE: ST
SEAL & SIGNATURE
DATE: 01/07/15
PROJECT No.: 449006-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:
S-004 18 of 21

FILE: J:\PROJECTS\CONED\ASTORIA\CAD\STRUC\507151.DWG, DATE: 02/02/2015 03:13:14PM, p0010763

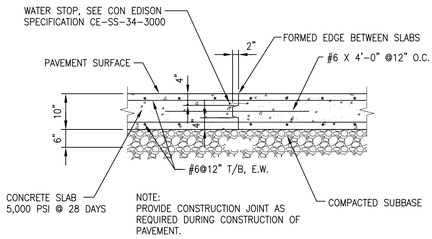


TYPICAL SLAB DETAIL



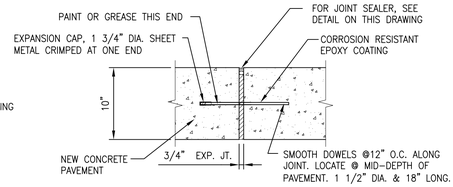
NOTE:
PROVIDE MINIMUM 3 INCH SIDE CLEARANCE
BETWEEN REBAR AND EDGE OF CONCRETE (TYP.).

SLAB AT EXCAVATED AREAS



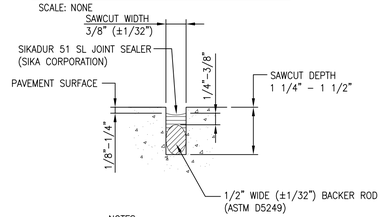
TYPICAL CONSTRUCTION JOINT DETAIL

SCALE: NONE

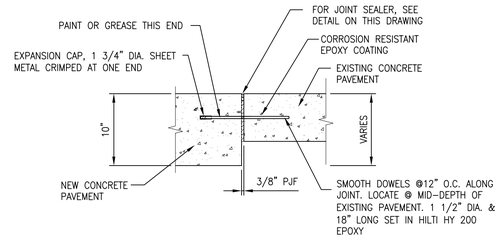


TYPICAL EXPANSION JOINT DETAIL

SCALE: NONE



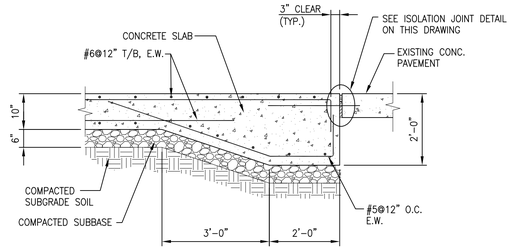
NOTES:
1. 3/8" WIDE 1 1/2" DEEP SAWCUT CONTRACTION JOINT AT 25' MAX. EACH WAY TYPICAL.
2. BACKER MATERIAL/ROD REQUIRED TO PREVENT SEALANT FROM BONDING TO BOTTOM OF SAWCUT.



TYPICAL ISOLATION JOINT DETAIL

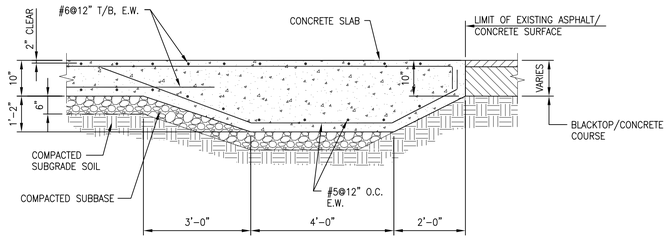
SCALE: NONE

NOTE:
DOWELS ARE NOT REQUIRED FOR EDGE JOINT
BETWEEN CONCRETE SLAB AND EXISTING
SUBSURFACE STRUCTURE.

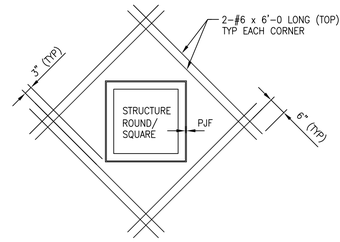


B DETAIL (TYPICAL EDGE JOINT BETWEEN NEW CONCRETE PAVEMENT AND EXISTING CONCRETE PAVEMENT)
SCALE: NONE

NOTE:
DOWELS ARE NOT REQUIRED FOR EDGE JOINT BETWEEN NEW
CONCRETE PAVEMENT AND EXISTING STRUCTURES.



A DETAIL (TYPICAL EDGE JOINT BETWEEN NEW CONCRETE SLAB AND EXISTING ASPHALT/CONCRETE SURFACE)
SCALE: NONE

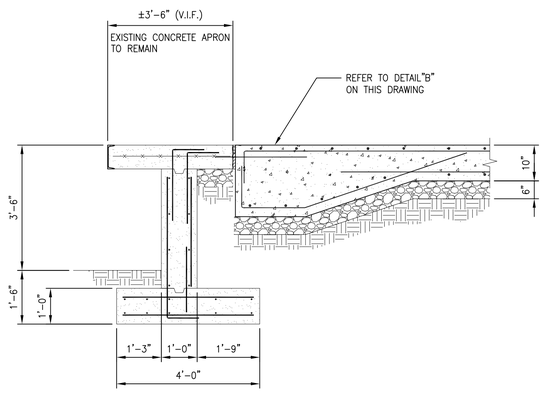


ADDITIONAL REINFORCING DETAIL

SCALE: NONE

CONCRETE SLAB DETAILS

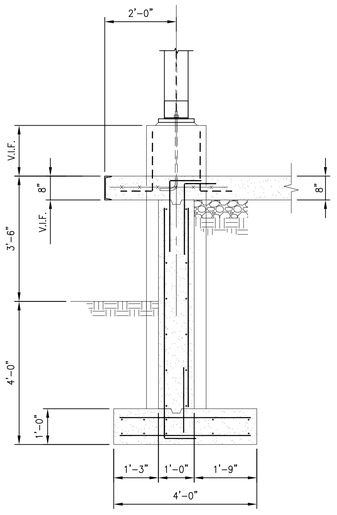
SCALE: NONE



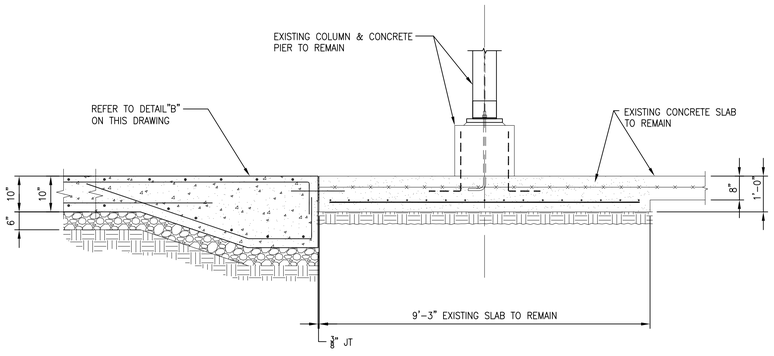
1 S-001 SECTION
SCALE: 1/2"=1'-0"

CONTRACTION AND SILICON JOINT SEAL DETAIL

SCALE: NONE



2 S-001 SECTION
SCALE: 1/2"=1'-0"



NOTE:
EXISTING 9'-3" SQ. x 1'-0" THICK CONCRETE
SLAB AT EXISTING COLUMN & PIER TO REMAIN.
REMOVE EXISTING ASPHALT PAVING TO VERIFY
EXTENTS IN FIELD. TOP OF NEW CONCRETE SLAB
ELEVATION TO MATCH EXISTING.

3 S-001 SECTION
SCALE: 1/2"=1'-0"

WARNING
0 ½ 1
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507152-B

CON EDISON
DWG. TYPE COMPANY
DWG. SIZE D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: SECTIONS & DETAILS

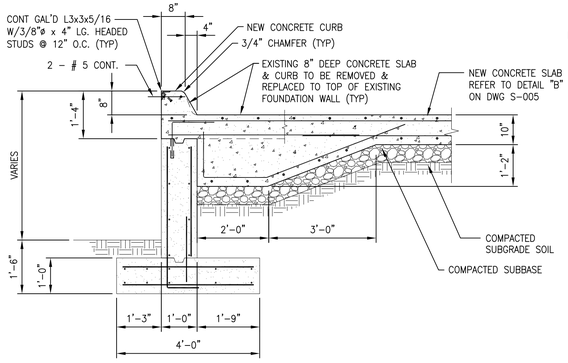
— APPROVALS —

ENGINEERING MANAGER: JD
PROJECT ENGINEER: DRY
DESIGNER: JBD
DRAWN BY: JBD
SCALE: AS NOTED.
DISCIPLINE CODE: ST
SEAL & SIGNATURE

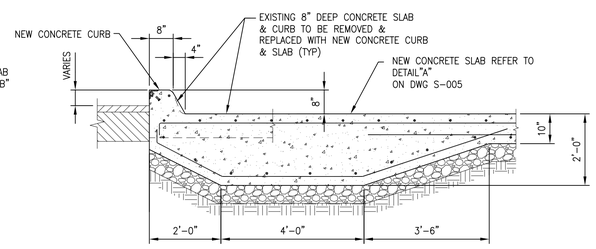
DATE: 01/07/15
PROJECT No.: 449008-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:

S-005 19 of 21

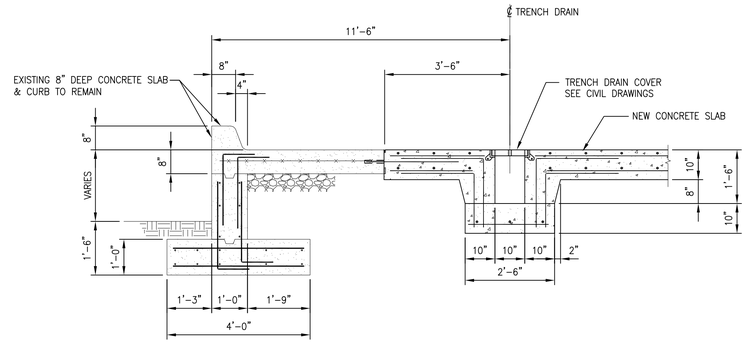
FILE: J:\PROJECTS\CONED\ASTORIA\CAD\STRUC\507152.DWG; DATE: 02/02/2015 03:14:35PM, p0010763



4 SECTION
S-001 SCALE: 1/2"=1'-0"

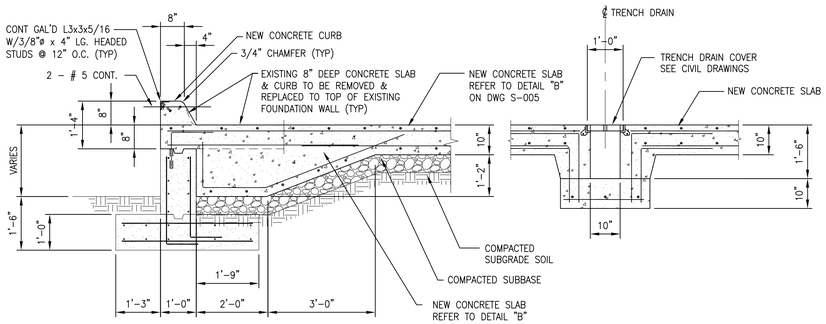


5 SECTION
S-001 SCALE: 1/2"=1'-0"

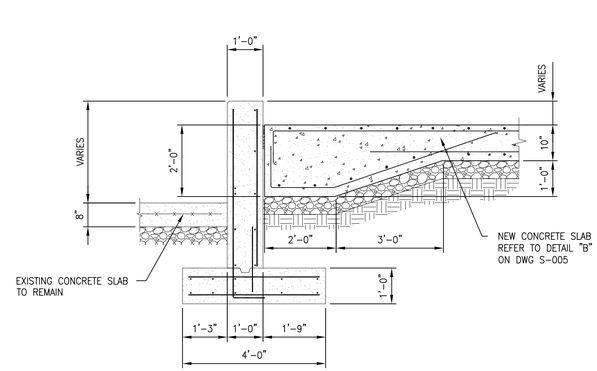


NOTE:
REPAIR OR REPLACE EXISTING CONCRETE CURB TO REMAIN AS REQUIRED (TYP)

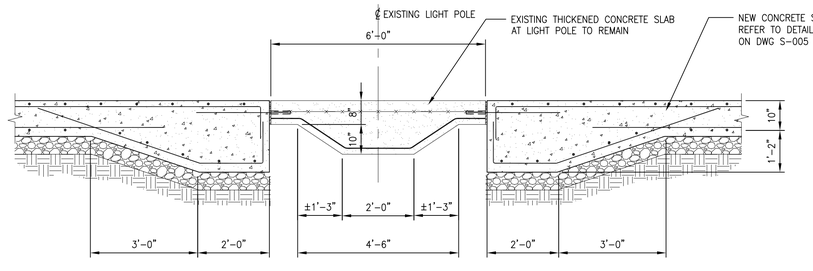
6 SECTION
S-001 SCALE: 1/2"=1'-0"



7 SECTION
S-001 SCALE: 1/2"=1'-0"



8 SECTION
S-001 SCALE: 1/2"=1'-0"



TYPICAL SLAB DETAIL AT LIGHT POLE TO REMAIN

SCALE: NONE

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507153-B

CON EDISON

DWG. TYPE: COMPANY

DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: SECTIONS & DETAILS

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: DRY

DESIGNER: JBD

DRAWN BY: JBD

SCALE: AS NOTED.

DISCIPLINE CODE: ST

SEAL & SIGNATURE

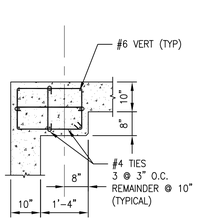
DATE: 01/07/15
PROJECT No.: 449008-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:

S-006 20of21

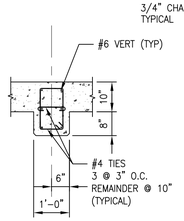
WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

FILE: J:\PROJECTS\CONED\ASTORIA\CAD\STRUC\507153.DWG, DATE: 02/02/2015 03:15:25PM, p0010763



P-1



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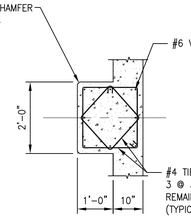

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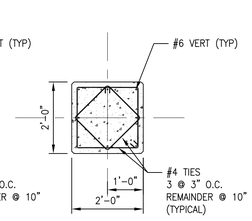

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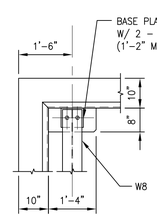

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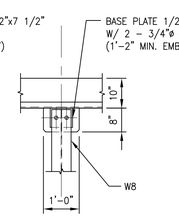

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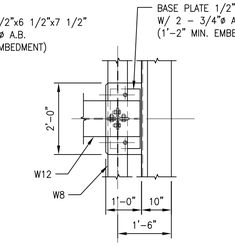

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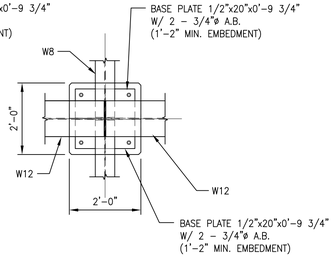

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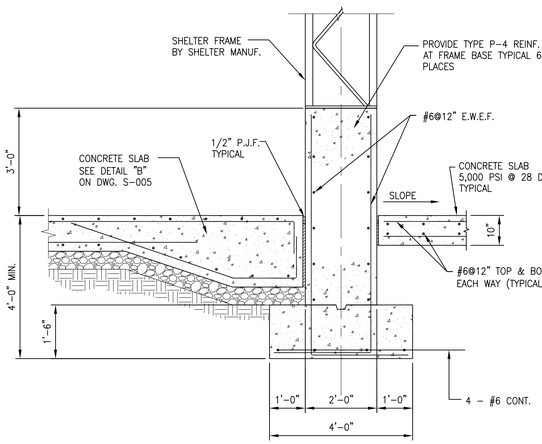

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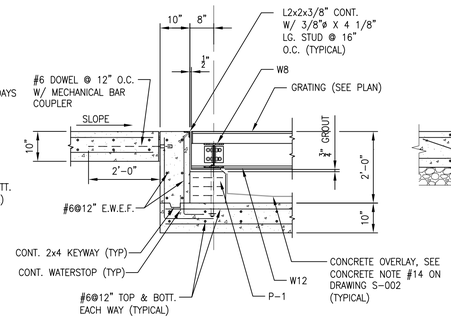

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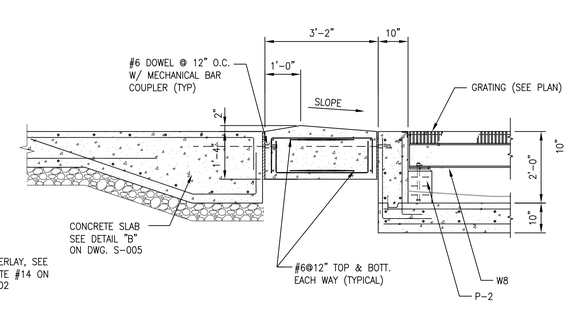

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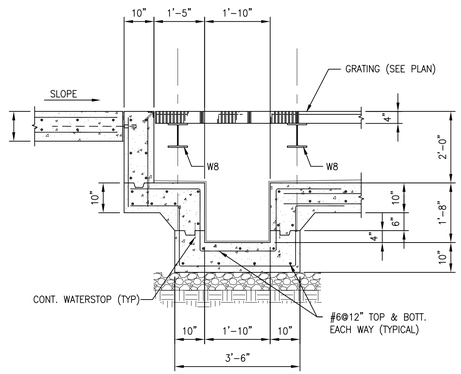

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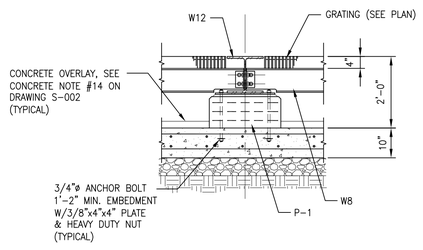

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COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. 507154-B

CON EDISON

DWG. TYPE: COMPANY

DWG. SIZE: D

LOCATION: ASTORIA EAST YARD

CITY, STATE: ASTORIA, NEW YORK

TITLE: SECTIONS & DETAILS

– APPROVALS –

ENGINEERING MANAGER: JD

PROJECT ENGINEER: DRY

DESIGNER: JBD

DRAWN BY: JBD

SCALE: AS NOTED.

DISCIPLINE CODE: ST

SEAL & SIGNATURE

DATE: 01/07/15
PROJECT No.: 449008-01000
DRAWING BY: JBD
CHK BY: DRY
DOB DWG No:

S-007 21 of 21

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COMMUNITY AIR MONITORING PLAN FOR THE REMEDIAL ACTION AT THE EAST YARD ASTORIA, NEW YORK

50% DESIGN SUBMITTAL

Prepared For:

Consolidated Edison Company of New York, Inc.

31-01 20th Avenue
Astoria, NY 11105

Prepared By:

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FEBRUARY 2015

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SECTION 1

INTRODUCTION

The Interim Corrective Measures (ICM) to be implemented at the Astoria East Yard (the Site) are detailed in an approved ICM Plan titled "Interim Corrective Measures Plan- Removal of PCB-impacted Soil within the East Yard Solid Waste Management Unit (SWMU)" (ICMWP). This document was prepared for Con Edison by AECOM and approved by the New York State Department of Environmental Conservation (NYSDEC) in November 2014. This document was developed based on analytical information collected during several phases of a remedial investigation at the Site. A summary of the historic investigation results is provided in the ICMWP. As required by the ICMWP, this Community Air Monitoring Plan (CAMP) will be conducted in compliance with the New York State Department of Health's (NYSDOH's) Generic Community Air Monitoring Plan. The CAMP is intended to provide a measure of protection to the downwind community (i.e., off-site receptors and workers not directly involved with the remedial activities) from potential airborne contaminant releases as a direct result of the proposed Remedial Activities.

The Astoria East Yard Site (the Site) remediation requires the removal of soils impacted by polychlorinated biphenyls (PCBs). Therefore, air monitoring will be conducted for fugitive dust which will serve as a surrogate for PCBs. The potential to encounter soils impacted by manufactured gas plant (MGP) activities also exists. As a result, air monitoring for volatile organic compounds (VOCs) will also be implemented at the Site. The CAMP will be implemented to adhere to air monitoring action levels and corresponding response actions described below.

SECTION 2

POTENTIAL RECEPTORS

The Site is situated in the south-central portion of the Astoria Facility southeast of the Transformer Shop (Bldg. 82). Potential on-site receptors include Con Edison employees working within and near East Yard.

Potential offsite receptors are nearby residents and businesses in the neighborhood along 20th Avenue, to the south of the Site. Figure 1 indicates the extent of construction at the Site along with the nearby onsite and offsite receptors.

SECTION 3

WIND DIRECTION MONITORING

A wind direction indicator (such as a wind sock) will be erected at the Site. This will enable on site personnel to determine the proper upwind and downwind equipment locations.

SECTION 4

AIR MONITORING EQUIPMENT

The following air monitoring equipment will be utilized for the Astoria East Yard Remedial Activities.

- A MiniRAM Portable Aerosol Monitor capable of measuring particulate matter (dust) less than 10 micrometers in size and capable of integrating over a period of 15 minutes (or less) will be used to monitor dust. The MiniRAM will include an audible alarm to indicate an audible alarm to indicate exceedance of the action level.
- A photoionization detector (PID) (RaeSystems MiniRae 2000 or equivalent) equipped with a 10.6 eV lamp capable of calculating 15 minute running averages will be used to monitor for VOCs;

All 15 minute readings will be recorded and available for the New York State Department of Environmental Conservation (NYSDEC) and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

SECTION 5

COMMUNITY AIR MONITORING

Community air monitoring will be conducted in compliance with the NYSDOH's Generic CAMP (NYSDOH, 2010). Real-time air monitoring for dust and VOCs, at the perimeter of the work zone, will be performed as described below:

5.1 Dust Monitoring

During all intrusive activities, dust levels will be monitored continuously at the downwind perimeter of the work zone with a portable real-time dust monitor. Upwind levels will be measured at the start of each workday and periodically thereafter to establish background levels. The following actions will be taken based on the dust levels measured:

- If the downwind dust level is 100 micrograms per cubic meter ($\mu g/m^3$) above background for the 15-minute period or if dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression provided that the downwind dust level does not exceed 130 $\mu g/m^3$ above background and no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, the downwind dust level is greater than 130 $\mu g/m^3$ above background, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind dust level to within 150 $\mu g/m^3$ of the background (upwind) level and in preventing visible dust migration.
- The dust monitoring action levels described above will also serve as the surrogate PCB action level described in Section 6.9 of the approved ICMWP. The USEPA Regional Screening Tool (RSL) indicates that an air concentration of 0.286 ug/m3 of PCBs is associated with a 1 x 10-6 cancer risk for a site worker, assuming an 18 month site work period, active 5 days per week, 10 hours per day. Using the maximum concentration of 2,200 ppm PCBs in soil from analytical data presented in the East Yard ICMWP, the RSL tool indicates the dust concentration that would pose a $1x10^{-6}$ cancer risk to a Site worker corresponds to a 130 ug/m3 dust concentration. Since the calculations are based on the maximum concentration for 18 month duration and the average site wide PCB concentration is 65.1 ppm PCB in the soil (with Non-Detects taken at the MDLs) the dust action levels described above would also serve as a conservative surrogate PCB action level.

5.2 VOC Monitoring

Continuous monitoring for VOCs will be conducted at the downwind perimeter of the work zone during intrusive activities. Upwind concentration readings will be measured at the start of each workday and periodically thereafter to establish background levels.

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If VOCs levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If the total VOC levels at the downwind perimeter of the work zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total VOC levels 200 feet downwind of the work 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 less than 5 ppm above background for the 15-minute average.
- If total VOC levels are above 25 ppm at the perimeter of the work zone, activities will be shutdown.

5.3 Dust and Odor Mitigation

The remedial contractor will be required to employ dust suppression measures, as needed, to prevent dust generation. This will most likely be accomplished by watering work areas and cover stockpiles.

If nuisance odors are identified at the Site boundary, or if odor control complains are received and confirmed to be a result of the Site remediation activities, work will be stopped and the source of odors will be identified. Specific control measures will be implemented by the remedial contractor to mitigate the odors. These activities may include (but are not limited to) limiting the area of open excavations and size of soil stockpiles or covering the source of the odor with tarps or foam. Work will continue as long as the odor is effectively mitigated through the use of odor controls. If the nuisance odors are not abated effectively, additional measures may be taken to eliminate odor nuisance including the direct load out of soils to trucks for disposal, the use of chemical odorants in spray or misting systems, and the use of staff to monitor odors in the surrounding neighborhood.

SECTION 6

REFERENCES

New York State Department of Environmental Conservation. (2010*). DER-10 / Technical Guidance for Site Investigation and Remediation*, New York

AECOM, November 2014. Astoria East Yard Interim Corrective Measures Work Plan, Astoria Facility, Queens, NY

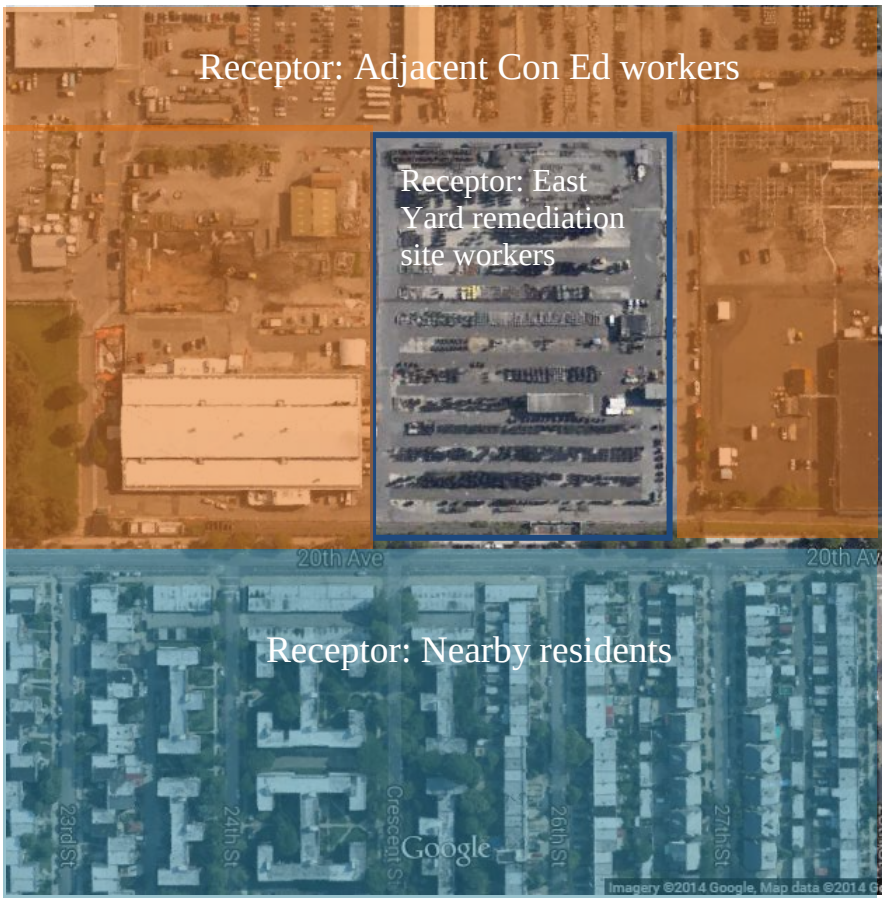

Figure 1 – Nearest Airborne Receptors/ Extents of Construction

APPENDIX G

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN FOR THE REMEDIAL ACTION AT THE EAST YARD, ASTORIA, NEW YORK

50% DESIGN SUBMITTAL

Prepared For:

Consolidated Edison Company of New York, Inc.

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Prepared By:

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SECTION 1

INTRODUCTION

1.1 PURPOSE AND REQUIREMENTS

This Construction Quality Assurance Procedures Plan (CQAPP) presents the procedures and protocols that will ensure the Interim Corrective Measures (ICM) at Consolidated Edison (Con Edison) East Yard facility located in Astoria, New York (the Site), will be executed in accordance with the approved design documents.

This CQAPP has been prepared in accordance with the DEC approved East Yard Interim Corrective Measures (ICMWP), under the New York State Department of Environmental Conservation (NYSDEC) RCRA Corrective Action Permit Number 2-6301-00006/00002-0.

1.2 PROJECT OBJECTIVES

The objectives of the Site Interim Corrective Measures are as follows:

- Remove soils contaminated with polychlorinated biphenyls (PCBs) exceeding the New York State Industrial Soil Cleanup objective (at concentrations greater than 25 ppm) from the areas designated within the approved Interim Corrective Measures (ICM).
- Construct new concrete pavement over the Site.
- Install upgrades to the Site stormwater system.
- Install upgrades to the Site Spill Prevention and Countermeasures and Control plan features.
- Manage construction water encountered during remediation activities. Treat and discharge construction water in accordance with the NYSDEC approved Outfall B and G permit standards.
- Protect the existing Site structures (i.e., buildings, loading dock, overhead crane, overhead utilities, underground utilities, access roads etc.) during construction activities.
- Conduct remediation and construction activities in such a way as to allow the day to day operations of the Site to continue without undue interruptions.
- Provide a safe work environment for the remediation workers, as well as, Con Edison personnel at and near the Site during construction activities.
- Conduct a Community Air Monitoring Program (CAMP) to document that odors, vapors and dust resulting from remedial construction activities do not pose an adverse risk to Con Edison employees and the surrounding community.

1.3 PLAN ORGANIZATION

This CQAPP is organized into four sections and two appendices. The purpose and overall project objectives are presented in Section 1. Project management, including roles and responsibilities of the project team, chain of command, communication, and meetings are presented in Section 2. Construction oversight tasks which will ensure the Interim Corrective

Measures quality, such as inspections, Quality Assurance/Quality Control (QA/QC) testing, and documentation, are presented in Section 3. Appendix G1 contains the Construction Sampling and Analysis Plan (CSAP). Appendix G2 contains the Analytical Quality Assurance Project Plan (AQAPP).

SECTION 2

PROJECT MANAGEMENT

2.1 ROLES AND RESPONSIBILITIES OF THE REMEDIAL ACTION PROJECT TEAM

Several organizations will be directly involved in the performance and review 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 organizational chart (Figure 2.1). A project contact list is provided on Table 2.1 below.

2.1.1 New York State Department of Environmental Conservation

Con Edison has submitted an ICMWP Plan to NYSDEC to implement the corrective measures as a final remedy for the Site. The ICMWP Plan was approved by NYSDEC in November 2014. The NYSDEC is the lead agency and has designated Mr. Douglas MacNeal as its Project Manager. Mr. MacNeal may participate in progress meetings and will conduct inspections on an as-needed basis, and approve any major design changes.

2.1.2 Con Edison

Con Edison is ultimately responsible for the design and implementation of the selected remedy specified for the Site. Con Edison has designated Mr. Christopher Hughes as its Project Manager and primary contact for this project. Con Edison will procure and direct a Remedial Contractor (RC) to execute the work in accordance with the Contract Documents prepared by Parsons. Con Edison will have a Construction Representative on-site to monitor and direct RC activities.

2.1.3 Parsons

Con Edison has retained Parsons as the Design Engineer for the project. During the remedial efforts, Parsons will be responsible for monitoring the performance of the RC to certify that the work is conducted in accordance with the Contract Documents (which will include the NYSDEC-approved Design Documents). The Design Engineer is responsible for implementing the quality assurance program and the RC is responsible for implementing the quality control program as defined by this CQAPP and the Technical Specifications. The Technical Specifications will be included with the 95% Design submittal. Parsons will initiate contact with Con Edison and facilitate coordination on design/field changes, participate and document progress meetings, review and make recommendations on approval of technical submittals from the RC, and inspect/certify the work. Parsons has designated Mr. John Dupras, P.E. as its Project Manager and primary contact for this project.

Mr. Shane Blauvelt, P.E. will serve as the Con Edison Program Manager for Parsons. Mr. Blauvelt is directly responsible to Con Edison and Parsons' management to ensure that the project objectives are met. Mr. Blauvelt will provide periodic reviews of the Parsons' project team performance.

Mr. Gregory Beck will serve as the Health and Safety Officer for this project. Mr. Beck will ensure that the Health and Safety Plan (HASP) is properly prepared and implemented and that all Parsons and its subcontractor site personnel are trained in the site-specific project health and safety requirements.

A Parsons representative (yet to be named) will be on-site full-time during the remediation and construction field efforts. The Parsons on-site representative will monitor and document the work of the RC, participate in progress meetings, oversee the CAMP, conduct QA sampling, and perform confirmatory sampling.

2.1.4 Remedial Contractor

Con Edison will hire and retain a RC who will be responsible for completion of the work as defined by the Contract Documents. The RC and their subcontractors will adhere to this CQAPP and the Technical Specifications which will include submittals to Con Edison and the Design Engineer.

The RC will have a full-time onsite site superintendent or project manager who will be responsible and have authority to act for all aspects of the RC's work. The site superintendent or project manager will be the point of contact for correspondence with the RC.

The RC will be responsible for implementing a quality control program as defined by this CQAPP and the Technical Specifications.

The RC will also have its own Site Health and Safety Officer who will be responsible for implementation of the RC's Construction Health and Safety Plan (CHASP). His/her specific responsibilities will include: ensuring that site personnel possess necessary training and medical surveillance; conducting daily safety meetings with the workers; establishing work zones and relocating zones as necessary; determining personal protective equipment requirements for specific work tasks and ordering any additional equipment as needed based on work area monitoring data; ensuring work is performed in compliance with the CHASP and applicable regulations; implementing the work zone air monitoring program and reporting data; performing routine safety inspections; and reporting and investigating accidents, incidents and near-misses.

2.2 CHAIN OF COMMAND AND COMMUNICATION

The chain of command on-site will start with the Con Edison Construction Representative. NYSDEC-related issues or concerns will be channeled through the Con Edison Construction Representative who will then be in direct communication with Mr. Hughes of Con Edison, who will (in turn) contact Mr. Doug MacNeal of NYSDEC. The Con Edison Construction Representative also communicates directly with the RC's site superintendent or project manager. To minimize confusion and miscommunication, NYSDEC and other agencies will not communicate directly with the RC or its subcontractors.

NYSDEC, Con Edison, the Parsons On-site Representative, or the RC may immediately stop work if there is a situation that threatens the safety of an onsite worker. However, if the work is being conducted safely and in accordance with the approved Final (100%) Design and Contract Documents, only Con Edison has the authority to stop work. If the work is not being conducted in accordance with the approved Final (100%) Remedial Design Report (RDR) and/or Contract Documents, the Con Edison Construction Representative has the authority to stop work.

NYSDEC or other agencies can communicate directly with the Con Edison Project Manager regarding a specific issue. If it is agreed by the agencies and Con Edison that work must be stopped to rectify an issue, the Con Edison Construction Representative will communicate directly with the RC's site superintendent or project manager.

2.3 MEETINGS

2.3.1 Construction Kickoff Meeting

Following approval of the Final (100%) RDR and procurement of a RC, a Construction Kickoff Meeting will be scheduled for the Project Team. Representatives from Con Edison, Parsons, and the RC will meet to introduce team members and discuss the construction activities including Site access, health and safety, chain-of-command, roles and responsibilities, Site conditions, and means and methods. A Site visit will follow the meeting.

The Design Engineer will coordinate the details of the meeting (i.e., agenda, meeting minutes, location, etc.) and prepare and distribute meeting minutes.

2.3.2 Progress Meetings

Progress meetings will be conducted weekly to discuss the prior week's completed work and the next week's anticipated work. Con Edison representatives, the Design Engineer, the RC's Construction site superintendent and/or project manager will participate, at a minimum. Any design or construction issues will be raised and addressed during the meeting. If any issues are identified involving a larger audience than that which typically participates, additional representatives from Con Edison, the RC or Design Engineer may be invited to participate. A two week look-ahead, as well as a brief project summary will be provided at each weekly meeting.

The Design Engineer will arrange the details of the meeting (i.e., agenda, meeting minutes, location, etc.) and prepare and distribute meeting minutes.

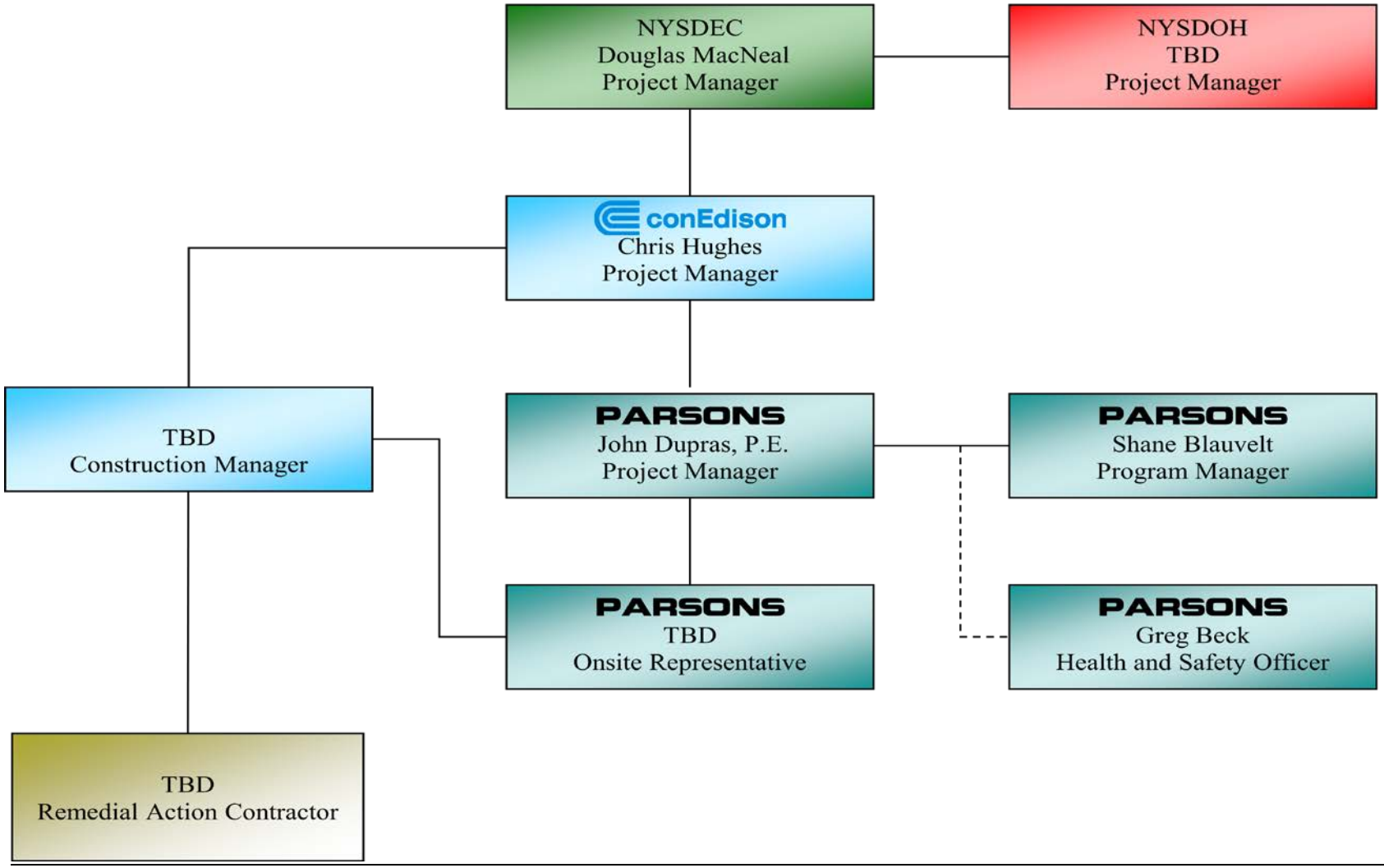
2.3.3 Construction Wrap-up Meeting

Following substantial completion of the corrective measures, the project team will meet to discuss the final punch list, site operation, maintenance, and monitoring, and project completion issues. The Final Engineering (Construction Certification) Report expectations will also be discussed.

Table 2.1 Project Contact List

NYSDEC/NYSDOH	
NYSDEC-DER/Remedial Bureau C Doug MacNeal, Project Manager 625 Broadway Albany, NY 12233 (P) 518-402-9564 (F) 718-482-*9679* (E) dkmacnea@gw.dec.state.ny.us	NYSDOH Bureau of Env. Exposure Investigation TBD
Con Edison	
Con Edison Christopher Hughes, Project Manager 31-02 20th Avenue - Building 136 Astoria, NY 11105 (P) 718-204-4295 (C) 917-647-0304 (E) hugheschr@coned.com	Con Edison Barry Cohen, Section Manager 31-01 20th Avenue, Bldg. 136 Astoria, NY 11105 (P) 718-204-4252 (C) (646) 739-9475 (E) cohenba@coned.com
Parsons	
Parsons Shane Blauvelt, P.E. Program Manager 301 Plainfield Road, Suite 350 Syracuse, NY 13212 (P) 315-552-9675 (F) 315-451-9570 (C) 315-559-9740 (E) shane.blauvelt@parsons.com	Parsons John Dupras, P.E. Project Manager 301 Plainfield Road, Suite 350 Syracuse, NY 13212 (C) 413-441-9724 (E) john.dupras@parsons.com
Parsons Scott Anderson Project Engineer 100 High Street Boston, MA 02110 (P) 732-537-3557 (E) scott.anderson@parsons.com	Parsons Gregory Beck Health and Safety Officer 200 Cottontail Lane Somerset, NJ 08873 (P) 732-537-3502 (F) 732-537-0353 (E) gregory.beck@parsons.com

Figure 2.1
Astoria East Yard Remedial Action
Project Organization Chart



SECTION 3

CONSTRUCTION OVERSIGHT TASKS

3.1 INSPECTIONS

Inspections will be conducted by members of the project team at various points of the project to ensure consistent quality is maintained. The Design Engineer will conduct inspections on a daily basis. NYSDEC and the other agencies are free to conduct inspections during any work hour period.

3.1.1 Routine Work Inspections

The Design Engineer will conduct routine inspections of the overall Site condition in addition to specific work elements. Overall Site condition items include field trailer, parking lot, access roads, staging areas, soil erosion and sediment control measures, security fence/gate(s), and survey markings. Specific work elements include the excavation areas and equipment, construction water management including the temporary water treatment system, decontamination, stockpiling of excavated soil, and loading and manifesting of waste disposal trucks. The RC will also be required to inspect all aspects of the project on a regular basis.

3.1.2 Pre-Final and Final Inspections

Following notification of substantial completion by the RC, Con Edison, and the Design Engineer will conduct a pre-final inspection of the Site. A final written work punch list will be prepared by the Design Engineer and reviewed by Con Edison for submittal to the RC. The final punch list will enable the RC to understand the project completion expectations and schedule work activities, including demobilization, accordingly. Once punch list items have been addressed by the RC and approved by the Design Engineer and Con Edison in writing, an ICM Construction Completion Report will be prepared, documenting sample locations, analytical results, and waste sampling and disposal records. This will be submitted to the NYSDEC as confirmation that the remedial action was completed.

3.2 QUALITY CONTROL AND ASSURANCE TESTING

QA/QC testing is part of ensuring that the corrective measures are completed in accordance with the Final (100%) RDR. Both the RC and the Design Engineer will have testing responsibilities as defined in Appendix G1, the Construction Sampling and Analysis Plan. In general these responsibilities include:

Remedial Contractor's Responsibilities:

- Waste characterization sampling and analysis as required by the Con Edison approved disposal facility.
- Paint filter testing of soil for disposal if required.
- Sampling/testing and analysis required for the initial submittal and approval of soil and geosynthetics, backfill materials and other materials to be used at the site.
- QC on-site construction material testing/sampling and analysis.

- Prepare a Construction Health and Safety Plan for review and approval by Con Edison, to address air monitoring for worker protection.
- Tests required for treatment or discharge of construction water.

Design Engineer's Responsibilities:

- Confirmatory sampling/testing and analysis;
- Observation of sampling/testing for placed soil materials;
- Observation of paint filter testing of soil for disposal if required;
- Community Air Monitoring Program (CAMP).

3.3 TECHNICAL SUBMITTAL REVIEW

The RC is required to prepare a schedule of submittals and meet the submittal requirements as stated in the design specifications and drawings. Construction submittals will be reviewed by Con Edison and the Design Engineer. Technical submittals specified in the RDR and the Technical Specifications will be reviewed by Con Edison and the Design Engineer.

3.4 DOCUMENTATION

3.4.1 Field Log Book

The Design Engineer and RC will maintain daily field log books for the project. Construction activities will be documented 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, delays and other construction related issues. In addition, a Figure will be prepared showing post excavation sample locations, which will be updated as samples are taken and result obtained (Figure 3.1).

3.4.2 Daily Field Reports

The Design Engineer will prepare a daily field report that summarizes construction activities. The daily field report will include details about the work completed, onsite equipment, employees, site visitors, weather, issues discussed, directions given to the RC, Site photos, CAMP data and associated corrective measures, and sketches of work completed as necessary. The report will be submitted to Con Edison on a daily basis. Refer to Figure 3.2 for an example of the Daily Field Report.

The RC will also prepare daily field reports of construction activities and submit them to Con Edison and the Design Engineer. Information in the daily field reports will include the RC's manpower and equipment on site, work performed that day, general information on weather, material received, etc.

The RC will prepare a daily QA /QC report summarizing the activities. The report will be submitted to Con Edison and the Design Engineer on a daily basis. Any QA/QC issues will be addressed at the daily QA/QC meeting between the RC, Con Edison and the Design Engineer. The QA/QC reports will be attached to the daily field report.

3.4.3 Final Interim Corrective Measures Construction Completion Report

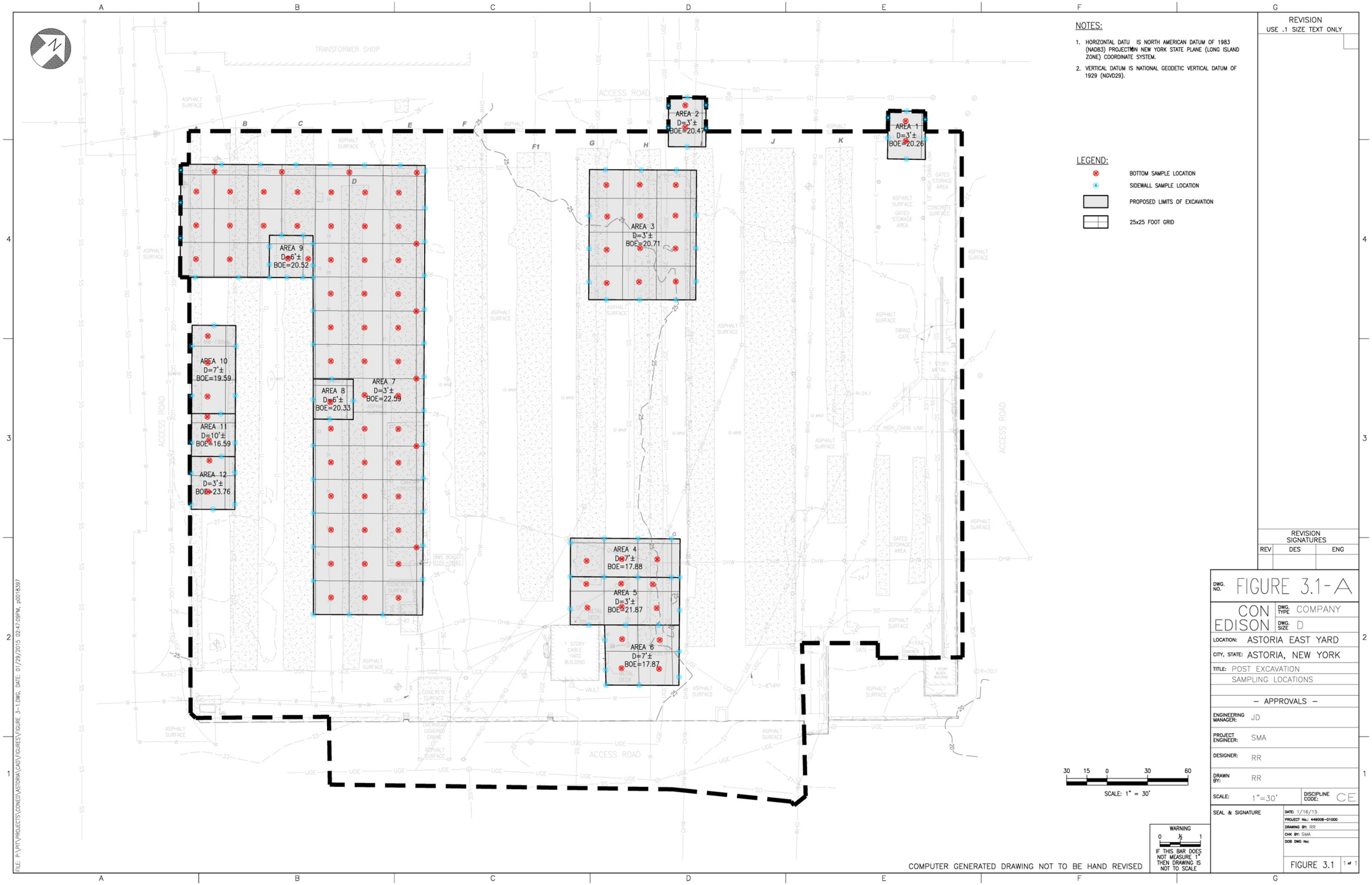
In accordance with the approved ICMWP, an ICM Construction Completion Report will be prepared upon receipt of all validated analytical data confirming that the removal action was complete and receipt of certifications of treatment/disposal from the treatment/disposal facility. The report will include the following:

- Site description;
- A description of field procedures and site activities;
- Verification sample locations and analytical results;
- Figures depicting the final excavation extents and verification sample results;
- Figures depicting the extent of new concrete pavement;
- A photographic record of the excavations and backfilling;
- Waste characterization sample data;
- Waste transport and treatment disposal information;
- Copies of waste manifests and bills of lading;
- Confirmation of backfill materials used; and
- Confirmation of concrete pavement installation.

Con Edison will maintain records and documents pertaining to this remediation in a centralized location for a minimum of three years. After three years, documents may be archived for long term record-keeping (for an indefinite period of time).

3.4.4 Field Change Form

Changes to the approved Final (100%) RDR will require approval by the Design Engineer and Con Edison. Any changes that impact the scope of soil remediation activities and deviate from the approved RDR will be submitted to the NYSDEC for approval. Figure 3.3 presents an example Field Change Form that includes a description and reason for the field change, date, and signatures. Material substitutions (i.e., "or equals") are not considered a field change and will be approved by the Design Engineer as part of the technical submittal review process.



NOTES:

1. HORIZONTAL DATU IS NORTH AMERICAN DATUM OF 1983 (NAD83) PROJECTION NEW YORK STATE PLANE (LONG ISLAND ZONE) COORDINATE SYSTEM.
2. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

LEGEND:

- BOTTOM SAMPLE LOCATION
- SIDEWALL SAMPLE LOCATION
- PROPOSED LIMITS OF EXCAVATION
- 25x25 FOOT GRID

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	DES	ENG

DWG. NO. FIGURE 3.1-A

CON EDISON — DWG. TYPE: COMPANY; DWG. SIZE: D

LOCATION: ASTORIA EAST YARD
CITY, STATE: ASTORIA, NEW YORK
TITLE: POST EXCAVATION SAMPLING LOCATIONS

– APPROVALS –

ENGINEERING MANAGER:	JD
PROJECT ENGINEER:	SMA
DESIGNER:	RR
DRAWN BY:	RR
SCALE:	1"=30'
DISCIPLINE CODE:	CE

SEAL & SIGNATURE

DATE: 1/16/15
PROJECT No.: 449008-01000
DRAWING BY: RR
CHK BY: SMA
DOB DWG No:

FIGURE 3.1 1 of 1

PARSONS

FIGURE 3.2

DAILY FIELD REPORT

JOB NAME Astoria East Yard DATE

PROJECT PCB Remediation REPORT NO.

JOB NO. 449008 SHEET Page 1 of 2

LOCATIO Astoria, NY WEATHER

CLIENT Con Edison

WORK IN PROGRESS OR COMPLETE (INCLUDING SUBCONTRACTORS):

CONTRACTOR EQUIPMENT	QUANTITY	CONTRACTOR WORK FORCE	QUANTITY

CONTRACTOR WORK HOURS:

VERBAL DISCUSSIONS/INSTRUCTIONS

REQUEST FOR PROJECT ACTION

VISITORS

ACCIDENTS REPORTED TODAY

ACCIDENTS REPORTED TO DATE

PARSONS REPRESENTATIVE

FIGURE 3.2 (CONTINUED)
DAILY FIELD REPORT

JOB NAME	Astoria East Yard	DATE	
PROJECT	PCB Remediation	REPORT NO.	
JOB NO.	449008	SHEET	Page 2 of 2
LOCATION	Astoria, NY	WEATHER	
CLIENT	Con Edison		

COMMUNITY AIR MONITORING DATA

WORK IN PROGRESS OR COMPLETE (cont.)

Photos attached? Y☐ N☐

Number of Photos: _____ Description_____

_____

_____

FIGURE 3.3

FIELD DESIGN CHANGE FORM

ASTORIA EAST YARD
ASTORIA, NEW YORK

RA Engineer: _____

FIELD DESIGN CHANGE

Project Number: Date:

Remedial Contractor:

This form shall be used for the issuance of instructions to the Remedial Contractor for a Field Design Change.

You are hereby authorized and instructed to effect the following modifications of the contract for the foregoing named project.

APPROVALS & DISTRIBUTION:

Design Engineer Representative

Signature: _____ Date: _____

Name (print or type): _____

Remedial Contractor Representative

Signature: _____ Date: _____

Name (print or type): _____

Con Edison Representative

Signature: _____ Date: _____

Name (print or type): _____

Regulator Representative

Signature: _____ Date: _____

Name (print or type): _____

cc:

APPENDIX G1

CONSTRUCTION SAMPLING AND ANALYSIS PLAN (CSAP)

APPENDIX G1

CONSTRUCTION SAMPLING AND ANALYSIS PLAN (CSAP)

APPENDIX G1

CONSTRUCTION SAMPLING AND ANALYSIS PLAN FOR REMEDIATION ACTION AT THE EAST YARD EAST YARD, ASTORIA, NEW YORK

50% DESIGN SUBMITTAL

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
Phone: (315) 451-9560
Fax: (315) 451-9570

FEBRUARY 2015

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SECTION 1

CONSTRUCTION SAMPLING AND ANALYSIS PLAN

1.1 INTRODUCTION

This Construction Sampling and Analysis Plan (CSAP) describes in detail the sampling and data gathering methods and procedures to be used during the Interim Corrective Measures (ICM) as well as the non-remediation construction activities at the Astoria East Yard site (the Site). A detailed description of the site, the Site history and background, and a description of the site-related impacts will be provided in Section 1 of the 100% Remedial Design Report (RDR). This CSAP should be used in conjunction with the Appendix G2, Analytical Quality Assurance Project Plan (AQAPP) to guide field and laboratory efforts at the Astoria East Yard site.

1.2 SAMPLING OBJECTIVES

The sampling objectives of the ICM are as follows:

Environmental Sampling

- Waste Characterization sampling of soil, concrete and asphalt removed from within the East Yard PCB Excavation Areas.
- Post-excavation confirmatory sampling of soil from the bottom and sidewalls of the excavation areas to confirm that the cleanup goal of 25 parts per million (ppm) polychlorinated biphenyls (PCBs) has been achieved.
- Paint filter testing of soil, if required, to ensure no free liquids are present prior to offsite disposal.
- Offsite borrow source testing to ensure imported soils comply with NYSDEC DER-10 guidance.

Geotechnical Testing

- Compaction testing of backfill placed in excavations and as structural fill under concrete paving.
- Sieve analysis of imported backfill to verify it meets the requirements for structural backfill, or the requirements for Backfill.

Construction Water and Water Column Testing

- Sample onsite treated construction water to ensure that the discharge limits have been met prior to discharge. Perform influent and unit treatment process sampling as needed to minimize the potential for discharge exceedances.
- Characterize construction water for offsite disposal (only if remedial contractor elects for offsite disposal in lieu of onsite treatment).

Health and Safety Air Monitoring

- Conduct air monitoring and sampling at the work zone and at the site perimeter to protect workers and the nearby community.

Table 1.1 presents sampling summary information including type of sampling, sampling frequency, and analytical methods. The sections below detail the sampling program for the construction period.

1.3 ENVIRONMENTAL SAMPLING

1.3.1 Waste Characterization Sampling of Soil, Concrete and Asphalt

The remedial contractor (RC) will perform waste characterization sampling and analysis of soil, concrete and asphalt within PCB Excavation Areas as necessary to meet the Con Edison approved disposal facility's acceptance criteria receiving these materials. The remedial contractor will also perform waste characterization sampling and analysis of soils excavated outside of the PCB Excavation Areas, that are not reused on site as backfill to meet the Con Edison approved disposal facility's acceptance criteria. Concrete and asphalt outside of the PCB Excavation Areas will be sent off site as Construction and Demolition debris to a Con Edison approved recycling/processing facility. The soil, concrete and asphalt waste characterization samples will be collected in laboratory-supplied clean glass jars. Samples will be analyzed by a NYSDOH ELAP certified laboratory retained by the RC for PCBs, RCRA Characteristics, full TCLP analysis (including TAL metals, VOCs, SVOCs, Pesticides, Herbicides) and other analytes as required by the Con Edison approved disposal facility. Remedial contractor will use only Con Edison approved waste transporters and Con Edison approved disposal facilities for disposal of soil, concrete and asphalt and any other materials removed from the Site.

1.3.2 Post-Excavation Confirmatory Sampling

The Design Engineer will perform post-excavation verification sampling on the sidewalls and bottom of the PCB Excavation Areas after the removal of contaminated soils to confirm the remediation goals defined as the removal of all soil containing greater than 25 ppm PCBs have been met, consistent with the approved Interim Corrective Measures Work Plan (ICMWP). The Design Engineer will coordinate access to the excavation areas with Con Edison and the Remedial Contractor for the collection of post-excavation soil samples. The PCB removal verification sampling will be conducted where the PCB Excavation Area is:

1. Less than 20 feet (ft)in perimeter, one sample from the excavation bottom and one sample from the bottom of the sidewall biased in the direction of surface runoff will be taken.

2. Greater than or equal to 20 ft in perimeter, one sample from the bottom of each sidewall every 30 linear ft of sidewall, and one sample from the bottom of the excavation every 625 square ft (i.e. at least one sample per 25 ft x 25 ft grid).

Each sample will be collected over a depth of three inches. Disposable plastic scoops will be used to collect each sample to avoid cross-contamination and the need for decontamination of sampling equipment. From the disposable plastic scoops, the sample will be transferred to laboratory-supplied clean glass jars and will be analyzed by an ELAP certified lab retained by

the Design Engineer for PCBs using United States Environmental Protection Agency (EPA) Methods 3550/8082. The estimated turnaround time for post excavation soil samples is three work days. Each sample will be tested for PCBs in a laboratory using United Stated Environmental Protection Agency (EPA) Method 3550/8082. The Design Engineer will record all sampling locations with a portable Global Positioning System (GPS) equipment or a ground-based survey accurate to 1 cm horizontal position and 2 cm vertical position, with coordinates reported in the project datums.

The Design Engineer will ensure that the (QA/QC) for the post-excavation verification samples is be conducted in accordance with the Appendix G2, Analytical Quality Assurance Control Plan.

If the analytical result of a verification sample is less than or equal to 25 ppm PCBs, soil removal activities will be considered complete in the area represented by that sample. If the analytical result exceeds 25 ppm PCBs, additional soil will be removed (either vertically or horizontally) from the area represented by that sample, and additional verification samples will be collected. The horizontal/vertical extent of the excavation will be based on contaminant concentration and site conditions and agreed upon with the NYSDEC and Con Edison.

1.3.3 Paint Filter Testing

The Design Engineer will conduct paint filter testing of soil to determine the presence of free liquids prior to loading into disposal trucks if required. Additional information on dewatering of soils below the water table prior to transport will be provided with the 95% RDR submittal. Note that solidified soil that clearly does not contain free liquids will not be tested.

1.3.4 Offsite Borrow for Backfill

The RC will complete backfilling once post-excavation verification sampling results have been reviewed by the owner, the Design Engineer and the NYSDEC, PCB impacted soil removed, and it is determined that additional excavation is not required. The RC will place a demarcation barrier at the bottom and sidewalls of the excavation to mark the extent and location of the backfill, and visually separate that from the native soil and existing fill. This layer will be made of geotextile layer and/or an orange polypropylene snow fence.

Imported backfill material will be tested to confirm it complies with 6 NYCRR Part 375-6.8(b) Restricted Residential Use soil cleanup objectives unless it is:

- Rock or stone, consisting of virgin material from a permitted mine or quarry; or
- Granular fill material (less than 10% passing #80 sieve) that is virgin material from a NYSDOT approved source.

Materials meeting the above criteria in the above bullets can be imported and used as backfill without chemical testing. All other material will be tested at the frequencies outlined in Table 1.1 and described below. Samples will be analyzed by a NYSDOH-certified Environmental Laboratory Accreditation Program (“ELAP”)-approved laboratory.

Off site source that contain solid waste, hazardous waste, or urban fill will not be used as backfill. Off site materials that are excavated or otherwise removed during spill cleanup or from a remediation site, a site suspected of contamination, or from an industrial facility will not be

used as backfill. Pursuant to the requirements of DER-10, the backfill will be tested prior to use onsite to ensure it complies with the criteria set forth in 6 NYCRR Part 375,6.8,(b) for *Restricted Residential Use*.

If the source of the backfill is from a virgin mine/pit, then one sample will be taken from initial 100 CY, for each source. Otherwise the backfill will be sampled in accordance with DER-10 and Table 5.4(e)10 for each source. The RC will perform grab samples for VOCs; composite samples consisting of three to five grabs will be taken for all other analytes.

The excavation will be backfilled and compacted by the RC in accordance with the technical specifications and drawings, the grade will be brought back to the required sub-grade elevation and surveyed after soil compaction is completed. This will prepare the site for subsequent concrete paving, which is expected to occur immediately after the remedial action is completed.

1.4 GEOTECHNICAL TESTING

1.4.1 Compaction Testing

The Design Engineer will conduct compaction testing of backfill placed in excavations. Refer to Technical Specification Section 02321, Compaction for compaction requirements. Technical specifications will be included with the 95% design.

1.5 CONSTRUCTION WATER MANAGEMENT AND TESTING

1.5.1 Testing of On Site Treatment and Disposal of Construction Water

The remedial contractor will ensure that all water generated during construction activities that is treated on site and discharged will comply with the surface water requirements issued by the NYSDEC, either those requirements specified under a stormwater consent order by Region 2 for the Outfall B and Outfall G construction projects (as specified in the tables below).

Initially, the RC will collect one grab sample from the first batch or batches of treated water to be analyzed by a lab retained by the RC for the parameters listed above. The first batch or batches of treated water will not be discharged unless the sample results meet the discharge requirements, thus verifying the effectiveness of the temporary water treatment system. After the effectiveness of the system is verified, the RC will collect monthly grab samples of the discharge thereafter. Water treated onsite that will be discharged through Outfall B or Outfall G must comply with the Surface Water Discharge Limits/Action Levels above.

1.5.2 Construction Water Testing

If the RC elects to dispose of construction water offsite in lieu of onsite treatment and disposal then the water will be sampled for in accordance with the Con Edison approved disposal facility's waste characterization requirements prior to being transported offsite. Samples will be analyzed by a NYSDOH ELAP certified laboratory retained by the RC. The RC will use only Con Edison approved waste disposal facilities for off site disposal of construction water.

Surface Water Discharge Limits:

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
TBD	Groundwater Construction dewatering	East River or Luyster Creek		

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
pH	6.0	9.0	SU	Monthly	Grab	

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL		ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max.	TYPE I				
Flow				MGD	Daily	Calculated	
Total Suspended Solids		50		mg/l	Monthly	Grab	
Oil & Grease		15		mg/l	Monthly	Grab	
Tetrachloroethene			0.026	mg/l	Monthly	Grab	
Benzene			0.10	mg/l	Monthly	Grab	
Toluene			0.10	mg/l	Monthly	Grab	
Xylenes			0.10	mg/l	Monthly	Grab	
Ethylbenzene			0.10	mg/l	Monthly	Grab	
Chromium			50	ug/l	Monthly	Grab	
Copper, Total			61	ug/l	Monthly	Grab	
Lead, Total			204	ug/l	Monthly	Grab	
Mercury			50	ng/l	Monthly	Grab	
Antimony			63	ug/l	Monthly	Grab	
Cadmium			77	ug/l	Monthly	Grab	
Nickel, Total			74	ug/l	Monthly	Grab	
Beryllium			11	ug/l	Monthly	Grab	
Selenium			50	ug/l	Monthly	Grab	
Silver			50	ug/l	Monthly	Grab	
Thallium			20	ug/l	Monthly	Grab	
Zinc, Total			66	ug/l	Monthly	Grab	
PCBs/ Arochlor		200		ng/l	Monthly	Grab	

1.6 WASTE DISPOSAL CHARACTERIZATION

1.6.1 Waste Handling, Staging and Disposal

All waste will be managed in accordance with local, state and federal cleanup regulations. Waste will be segregated by matrix type (i.e., soil, concrete, asphalt), aqueous wastes or solid materials (e.g., PPE) and appropriately managed and disposed off-site. The waste will be adequately characterized to meet the requirements of the designated facility permitted to accept the waste prior to disposal.

1.6.2 Equipment Decontamination

The remedial contractor will decontaminate all moveable equipment, tools, and sampling equipment which have contacted the PCB-impacted soil prior to leaving decontamination zone. The RC will be responsible for the prevention of cross contamination of clean areas within the site, through appropriate sequencing, the use of decontamination pads, placement of poly, or other methods as specified by the remedial contractor. The RC will construct a decontamination pad consisting of crushed stone, and an impervious liner prior to the start of work. Alternately, a portable self contained decontamination unit may be utilized. The RC will remove soil, debris, and other miscellaneous materials from the undercarriages and wheels of all construction equipment and tools used by means of a high-pressure, low volume steam cleaner. Physical/mechanical agitation of soil may be used to minimize wastewater generation. The RC will pump rinse water generated during the decontamination procedures from the decontamination pad sump for storage in temporary storage containers for off-site disposal or treatment on site by the RC's waste treatment system.

The RC will ensure all decontamination wastes, personal protective equipment (PPE), and polyethylene that come in contact with PCB-impacted soil within the PCB Excavation Areas and other site soils will be disposed of as PCB Remediation Wastes. Wastes will be segregated as to matrix, aqueous, non-aqueous liquids, or solid materials and disposed of by Con Edison approved transporters and disposal facilities.

1.7 HEALTH AND SAFETY MONITORING

1.7.1 Community Air Monitoring Plan

The Design Engineer will provide air monitoring efforts related to the Community Air Monitoring Plan (CAMP) requirements as described in Appendix D.

1.7.1.1 Air Monitoring Equipment Calibration

Air monitoring equipment that requires calibration prior to operation will be calibrated daily in accordance with the manufacturer's instructions. Instrument calibrations will be documented in the project field book. Instrument operating manuals will be maintained on-site by the field team.

1.7.2 Work Zone Air Monitoring

The RC will develop a Construction Health and Safety Plan (CHASP) and submit it to Con Edison for their review and approval. The RC is responsible for all work zone air monitoring

required for their workers and will be performed in accordance with the Con Edison approved Construction Health and Safety Plan (CHASP).

The Design Engineer is responsible for all work zone air monitoring required for their workers and will be performed in accordance with the Con Edison approved Construction Health and Safety Plan (CHASP) to be developed by the Design Engineer.

TABLE 1.1
Sampling Summary Table

Sample Description	Sampling Frequency	Estimated # of Samples	QA/QC Samples	Parameter(s)	Analytical Method
Characterization Sampling of Concrete, Asphalt and Soil within the PCB Excavation Areas	Sampling frequency will be dictated by acceptance criteria of Con Edison approved disposal facility	TBD at 95 % Design Level	Not Required	PCBs Other parameters as required by the disposal facility	PCB: EPA 3550/ 8082 Other Methods as required by the disposal facility
Characterization sampling for soils prior to offsite disposal	Soils will be disposed of as PCB remediation waste. Sampling frequency will be dictated by acceptance criteria of Con Edison approved disposal facility	TBD at 95% Design Level	Not Required	PCBs Other parameters as required by the disposal facility	PCB: EPA 3550/ 8082 Other Methods as required by the disposal facility
Confirmation Sampling: Bottom & Sidewalls	Excavation areas <20 ft in perimeter, 1 bottom sample, 1 sidewall sample biased in the direction of surface runoff Excavation areas > 20 ft in perimeter, 1 bottom sample per 30 linear ft of sidewall, one bottom sample per 625 square ft.	Side ~ 100 Bottom ~ 100	MS/MSD = one per 20 samples Duplicate = one per 10 samples FB = 1 per day	PCBs	PCB: EPA 3550/8082
Paint Filter Testing	2 grab samples from each soil stockpile to be disposed offsite, if soil stockpile appears to contain free liquids (Exclude stockpiles that clearly do not contain free liquids.)	20 (Assumed)	N/A	Free liquids	EPA Method 9095B
Backfill from off site sources	For off site sources that are: • Rock or stone, consisting of virgin material from a permitted mine or quarry; or • Granular fill material (less than 10% passing #80 sieve) that is virgin material from a NYSDOT approved source.	Not Required	Not Required	Not Required	Not Required
	If the source of the backfill is from a virgin mine/pit, then one sample will be taken from initial 100 CY from each source.	1 (1 source assumed)	Not Required	As required to meet 6 NYCRR Part 375-6.8(b) Restricted Residential Use	TBD at 95% Design Level

Sample Description	Sampling Frequency	Estimated # of Samples	QA/QC Samples	Parameter(s)	Analytical Method
	Non-virgin pit or mine: The source will be sampled in accordance with DER-10 and Table 5.4(e)10 for each source. The RC will perform grab samples for VOCs; composite samples consisting of three to five grabs will be taken for all other analytes.	7 (assumed)	MS/MSD = 1 per 20 samples Duplicate = 1 per 20 samples FB = 1 per day	As required to meet 6 NYCRR Part 375-6.8(b) Restricted Residential Use	TBD at 95% Design Level
In Place Compaction Testing	10 tests per acre per lift (See Technical Specification Section 02321)	TBD at 95% Design Level	N/A	Nuclear Density Testing Moisture Content	ASTM D2922 ASTM D2216
Construction Water Discharge Sampling	Initially, 1 grab sample of the first batch or batches of treated water until the treatment system effectiveness is verified in accordance with the NYSDEC) Effluent Limitations and Monitoring Requirements. Monthly grab sampling thereafter.	TBD at 95% Design Level	Not Required	Per SPDES Discharge Permit Requirements	TBD at 95% Design Level
Characterization Testing for Offsite Construction Water Disposal	As required by disposal facility Sampling frequency will be dictated by acceptance criteria of Con Edison approved disposal facility	TBD at 95% Design Level	Not Required	TBD at 95% Design Level CBs Other parameters as required by the Con Edison approved disposal facility	TBD at 95% Design Level

SECTION 2

SAMPLING EQUIPMENT AND PROCEDURES FOR FIELD EQUIPMENT DECONTAMINATION, WASTE MANAGEMENT, AND EQUIPMENT CALIBRATION

2.1 FIELD EQUIPMENT CHECKLIST

A general list of equipment necessary for field measurement and sample collection includes:

- Appropriate sample containers (see Appendix G2, AQAPP);
- Chain-of-Custody (COC) seals and record forms;
- Log book and indelible ink markers;
- Phosphate-free decontamination soaps (such as Alconox), reagent-grade solvents, and deionized water to be used for decontaminating equipment between sampling stations;
- Buckets, plastic wash basins, plastic drop cloths, and scrub brushes to be used for decontaminating equipment;
- Camera and film for use in documenting sampling procedures and sample locations;
- Stakes to identify sampling locations;
- Shipping labels and forms;
- Knife;
- Bubble wrap or other packing/shipping material for sample bottles;
- Strapping tape;
- Clear plastic tape;
- Coolers;
- Duct tape;
- Rope;
- Resealable plastic bags;
- Portable field instruments (photoionization detector, conductivity meter, pH/temperature/conductivity meter, electronic water level indicator, etc.); and
- Health and safety equipment.

2.2 DECONTAMINATION

Sampling equipment decontamination will be conducted in buckets on plastic sheeting. Bowls, spoons, augers, bailers, and filtering equipment will be washed in potable water and phosphate-free detergent (e.g., Alconox) following sampling activities. The sampling equipment will then be rinsed with potable water. If disposable sampling equipment is used, decontamination will not be necessary. The disposable sampling equipment will be disposed of as used personal protective equipment (PPE).

2.3 MANAGEMENT OF WASTE

2.3.1 Decontamination Fluids

Decontamination fluids will be collected in 55-gallon drums or a plastic temporary holding tank. Decontamination fluids will be stored with and treated or disposed as construction water. For offsite disposal, provide a dedicated on-site storage location that is readily accessible to transport tanker trucks. Characterization sampling and off-site disposal at a Con Edison-approved waste transportation and disposal facility will be coordinated if necessary.

2.3.2 Personal Protective Equipment

Disposable PPE (i.e., Tyvek suits, booties, latex gloves, etc.) will be placed in 55-gallon drums or an approved container and staged for proper disposal.

2.4 FIELD INSTRUMENT CALIBRATION

Field screening and sampling instruments that require calibration prior to operation will be calibrated daily in accordance with the manufacturer's instructions. Instrument calibrations will be documented in the project field book. Instrument operating manuals will be maintained on-site by the field team.

2.5 MAINTENANCE PROCEDURES

2.5.1 Non-Routine Maintenance Procedures

Field equipment will be inspected prior to initiation of fieldwork to determine whether or not it is operational. If it is not operational, it will be serviced or replaced. Batteries will be fully charged or fresh, as applicable.

2.5.2 Routine Maintenance Procedures and Schedules

Field equipment requiring preventive maintenance will be serviced in accordance with written procedures based on the manufacturer's instructions or recommendations. Maintenance will be performed in accordance with the schedule specified by the manufacturer, in order to minimize the downtime of the measurement system. Maintenance work will be performed by qualified personnel.

SECTION 3

SAMPLING EQUIPMENT AND PROCEDURES FOR FIELD MEASUREMENTS AND MONITORING

3.1 PAINT FILTER TESTING

Paint filter testing will be conducted on excavated soil to determine the presence of free liquids prior to loading into disposal trucks if required. The test will be conducted at the site in accordance with EPA Method 9095B. Equipment required for the test includes a conical fine mesh paint filter (mesh #60 +/-5%), funnel, stand or tripod and container/cup. Note that soil that clearly does not contain free liquids will not be tested.

Method

- Assemble the test apparatus by placing the paint filter in the funnel and the funnel tip into the container/cup. Support the assembly as needed.
- Place approximately 100 grams of sediment/soil in the paint filter
- Allow the sample to drain into the container/cup for 5 minutes.
- If any portion of the test material collects in the container/cup within the 5-minute period, then the material is deemed to contain free liquids.

3.2 AIR MONITORING

Air monitoring for volatile organic compounds (VOCs) will be conducted as required during field activities with a RaeSystems MiniRae 2000 (or equivalent) photoionization detector (PID) equipped with a 10.6 eV lamp. The Photovac MicroTip is capable of ionizing and detecting compounds with an ionization potential of less than 10.6 eV. This accounts for roughly 54 percent to 73 percent of the volatile organic compounds (VOCs) on the NYSDEC ASP Target Compound List and for most of the VOCs detected onsite. The compounds with ionization potentials above 10.6 eV have correspondingly high allowable limits, for example 100 ppm for 1,1-DCA and 350 ppm for 1,1,1-TCA. The PID will be used to monitor for VOCs in the breathing zone, and to screen samples for analysis.

Method

- The PID will be calibrated at the beginning and end of each day of use with a standard calibration gas of a concentration within the expected range of use. The calibration gas which is most often used has an approximate concentration of 100 ppm of isobutylene.
- If abnormal or erratic readings are observed, additional calibration will be required.
- All calibration data will be recorded in field notebooks and on calibration log sheets to be maintained on-site.
- The PID will be used to monitor the breathing zone during excavation. Action levels are specified in the Health and Safety Plan (HASP).
- The PID will also be used to screen samples and sample headspace.

- PID readings will be recorded in the field book and on the drilling record during drilling activities.
- A battery check will be completed at the beginning and end of each working day, and the battery will be checked for proper voltage.
- Detailed procedures for operation of the PID are included in the HASP.

SECTION 4

PROCEDURES FOR GEOTECHNICAL TESTING

4.1 CONSTRUCTION MATERIAL TESTING

The Remedial Contractor (RC) will be responsible for testing manufactured materials. Testing results must be submitted to the Design Engineer per Section 01350, Submittals. Technical specifications will be included in the 95% RDR. For required factory testing, the manufacturer's suggested sampling/testing procedures will be followed. For onsite testing, an independent testing company, under the direct supervision of the RC will conduct the testing. The testing procedures will be in accordance with industry standards relevant to the Technical Specification. The Design Engineer will review and approve the testing results according to the submittal protocol.

The RC will be responsible for the QC testing of offsite materials (i.e., topsoil, gravel, fill, etc.). The RC will be responsible for the QA testing of in-place materials (i.e. backfill, restoration, etc.) in accordance with the requirements set forth within this document and the Technical Specifications to be included in the 95% RDR.

SECTION 5

PROCEDURES FOR ENVIRONMENTAL FIELD SAMPLE COLLECTION

5.1 INTRODUCTION

Procedures for obtaining samples of various environmental media are described in this section. Sample handling and procedures are described in Section 6.

5.2 POST EXCAVATION CONFIRMATORY SOIL SAMPLING

Soil sampling will be conducted using the following procedures:

- The Design Engineer will perform the confirmatory post excavation soil sampling. The RC will provide access and assistance, as needed, to properly collect the sample.
- Field personnel responsible for sampling will don the appropriate personal protective equipment according to the Site-Specific Construction Health and Safety Plan (CHASP).
- Soil samples will be collected utilizing a disposable plastic sampling scoop..
- Samples will be placed directly from the decontaminated sampling equipment into a sample container. Sample containers will be labeled.
- Sample description, depth, and location will be recorded in the field book.
- All sampling locations will be recorded by using portable GPS equipment or a ground-based survey accurate to 1 cm horizontal position and 2 cm vertical position.
- QC samples will be prepared in accordance with the procedures described in Appendix G2, Analytical Quality Assurance Project Plan (AQAPP).
- Samples for offsite laboratory analysis will be packed and shipped according to Section 6.
- Any soil remaining after sampling will be disposed of as PCB remediation waste by the RC.

SECTION 6

SAMPLE HANDLING AND ANALYSIS

6.1 SAMPLE DESIGNATION

Each sample will be given a unique alphanumeric identifier in accordance with the classification system shown in Table 6.1. Duplicate samples will be assigned identifiers that do not allow the laboratory to distinguish them as duplicates. Each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

6.2 SAMPLE CONTAINERIZATION, PRESERVATION AND ANALYSIS

6.2.1 Sample Container Preparation and Sample Preservation

Sample containerization, holding time requirements, and preservation requirements are listed in the AQAPP. Field handling and storage of samples and sample containers is described in the AQAPP. Analytical methods for sample analyses are listed in the AQAPP.

6.3 CHAIN OF CUSTODY

A COC record (Figure 6.1) will accompany the sample containers during selection and preparation at the laboratory, during shipment to the laboratory, and during return shipment to the field. The COC will identify each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample shipment.

Method

- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed-out with a single line and initialed by the author.
- The REMARKS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.
- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the COC form, the method of shipment, the shipping cooler identification number(s), and the shipper airbill number will be entered on the COC.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space. Duplicate copies of each COC must be completed.

- One copy of the COC will be retained by sampling personnel. The other copy and the original will be sealed in a plastic bag and taped inside the lid of the shipping cooler.
- Sample shipments going to chemical analytical laboratories will be refrigerated at 4°C, typically by packing with ice, to preserve the samples during shipment.
- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper.
- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape.
- Then the cooler will be relinquished to the shipper, typically an overnight carrier or picked.
- The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Parsons Project Manager, and the samples will not be analyzed.
- The chemical analytical samples must be delivered to the laboratory within 72 hours of collection.

6.4 SAMPLE DOCUMENTATION

The field team leader will retain a copy of the COC, and, in addition, the field team leader will ensure that the following information about each sample is recorded in the field book:

- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Sample identifier;
- Identification of sampled media (e.g., soil, sediment, groundwater);
- Sample location with respect to known reference point;
- Physical description of sample location;
- Field measurements, (e.g., pH, temperature, conductivity, and water levels);
- Date and time of collection;
- Sample collection method;
- Number of sample containers;
- Analytical parameters;
- Preservatives used; and
- Shipping information:
  - Dates and method of sample shipments,
  - COC record numbers,
  - FedEx air bill numbers, if applicable and

– Sample recipient (e.g., laboratory name).

6.5 SAMPLE TRACKING

Parsons will use an in-house tracking system to monitor sampling schedules, and the progress of laboratory analytical work and reporting, and to assist in performing contract compliance screening and data validation. The system tracks the following information for each sample: sample identifier, sample medium, sampling date, analytical parameters, sample delivery group (SDG) designations for samples, and laboratory report due date.

The sample tracking system consists of the following procedures:

1. A Data Tracker (DT) will be assigned to each sampling event. The DT will provide sequentially numbered COC forms to the field sampling team (FT), and maintain a COC log. The FT will sign-out the COC forms prior to sampling.
2. The FT will ship the white (original) and yellow copy of the completed COCs to the laboratory with the field samples. The serial numbers of all the COCs that were either sent to the laboratory or voided will be recorded in the field book.
3. The FT will return: (1) pink copies of the COC forms that were sent to the lab; (2) voided COCs; and (3) any unused COCs to the DT. The DT will maintain a file of the completed COCs for each project, and will keep an inventory of all the numbered COCs.
4. The DT will enter the following information into the COC log: (1) all COC numbers (including voided or unused numbers); (2) names of FT members; (3) site name; (4) project number; (5) sampling date; (6) shipping date; (7) number of samples per matrix; (8) analytical parameters requested; and (9) the laboratory name, address, and phone number.
5. The DT will call the laboratory on the work day following receipt of the COCs to confirm the time, date, and condition of the samples shipped; to determine laboratory SDG identifiers; and to confirm the contract-required due-date for receipt of analytical results.
6. The DT will use an electronic spreadsheet and database program to generate a Sample Tracking Report monthly, or more frequently if necessary. The database allows sampling data to be sorted by site name, project number, sampling dates, project number, laboratory, and laboratory name.
7. The Project Manager or a designated representative will maintain day-to-day contact with the laboratory to monitor the progress of analytical work.
8. The DT will contact the Parsons Project Manager every Friday to determine the status of analytical work, and to confirm the dates for contract compliance screening and data validation.
9. The Project Manager will deliver sample analytical results received from the laboratory to the DT for contract compliance screening, and to the data validator for validation as specified elsewhere in this document. The Project Manager will retain the shipping receipt to document the date of receipt, and forward the shipping receipt to the data validator with the analytical package.

TABLE 6.1

SAMPLE DESIGNATION

SAMPLE IDENTIFIER:

Sample Type	Sample Number	Depth Code	QC Identifier
LL	NN	L	LL

L = Letter
N = Number

SAMPLE TYPES:

Solid	Water
SD – Sediment	SW - Surface Water
SS - Surface soil	CW – Construction water
	DW - Drill Water/Decon Water

SAMPLE NUMBER: Number referenced to a sample location map. Samples are numbered consecutively beginning with the next number following any previous samples.

DEPTH CODE: Depth in feet of sample interval:

A=0 to 2 ft; B=2 to 4 ft, etc.

a=0 to 12 inches, b = 12 to 24 inches, etc.

QC IDENTIFIER:
FB - Field Blank
TB - Trip Blank
WB - Wash Blank
MS - Matrix Spike
MD - Matrix Spike Duplicate
MB - Matrix Blank

FIGURE 6.1 CHAIN OF CUSTODY RECORD

CLIENT:	PROJECT NO:	PROJECT MGR:	ANALYSES REQUIRED	Send results to: PARSONS 290 Elwood Davis Road-Suite 312 Liverpool, NY 13088 Telephone: (315) 451-9560 Fax: (315) 451-9570
PROJECT NAME:	NOTES - (Reference QAPP and/or analytical protocols to be used):			Lab Submitted to:
SAMPLERS:				

FIELD SAMPLE ID	LOCATION DESCRIPTION	DATE	TIME	GRAB	COMP	MATRIX	Number of Bottles	REMARKS

Relinquished by: (Signature)	Date:	Time:	Shipped via:	Airbill #:	Received by: (Signature)	Date:	Time:	Cooler Temp: ____ °C Samples Intact: ____Yes ____No
Relinquished by: (Signature)	Date:	Time:	Shipped via:	Airbill #:	Received by: (Signature)	Date:	Time:	Cooler Temp: ____ °C Samples Intact: ____Yes ____No
Relinquished by: (Signature)	Date:	Time:	Shipped via:	Airbill #:	Received by: (Signature)	Date:	Time:	Cooler Temp: ____ °C Samples Intact: ____Yes ____No

TYPE CODES:

SOLID		WATER			MATRIX	QUALITY CONTROL
SD- Sediment	TP- Test Pit/Tank Pit	MW- Monitoring Well	FD- Fuel Dispenser	ST- Storm Water	W - Water	FB- Field Blank (with date)
SS- Surface Soil	DR- Drum Waste	LC- Leachate	MH- Manhole	WW- Waste Water	S - Soil	TB- Trip Blank (with date)
SB- Subsurface Soil	WA- Solid Waste	SW- Surface Water	OW- Oil Water Separator	OL- Other Liquid (eg. Drum liquid)		WB- Wash Blank (with date)
MW- Monitoring Well Boring	OS- Other Solid	DW- Drill Water	PR- Piping Run			

SECTION 7

SAMPLING QA AUDITS

7.1 SAMPLING QA AUDITS

Sampling QA audits may be conducted to verify that fieldwork is conducted in accordance with the procedures specified in this document. The QA audits will be performed by the approved quality assurance officer (QAO) or a qualified designee under the direction of the QAO. The designee will not have responsibility for the project work associated with the audit.

Sampling QA audits will include, but will not be limited by, review of the following items:

- Decontamination procedures;
- Sampling procedures;
- Sampling container cleanliness, size, and material;
- Sample identification (labels and COC);
- Sample handling, preservation, and shipping;
- Sample tracking;
- Maintenance and calibration of sampling equipment; and,
- Corrective action.

An audit report must be submitted to the Parsons Project Manager within 15 days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. This may be accomplished by issuing a Corrective Action Request (CAR) (Figure 7.1). The CAR identifies the out-of-compliance condition, reference documents, and recommended corrective action. The CAR will be issued to the individual(s) responsible for the noncompliance and to the Project Manager. The individual to whom the CAR is addressed will respond by writing a brief description of the cause and corrective action required in the appropriate area on the CAR, sign and date the response, and return the CAR to the QAO.

The Project Manager will be responsible for ensuring that all required corrective actions identified during an audit are acted upon promptly and satisfactorily. The QAO or a qualified designee will verify and document that satisfactory corrective action has been taken. All audit checklists, audit reports, audit findings, and acceptable resolutions will be approved by the QAO. Then the QAO will close the audit. The QAO will maintain a status log for CARs, and the CARs will be retained in the project file.

7.2 RECORD MAINTENANCE

A project file will be established to retain the documents and records generated during the project. Field records will be stored in the project file when not in use. At the conclusion of the work assignment the project file will be archived.

Field records that must be retained in the project files include:

- Field books;
- COC forms;

- Site photographs; and,
- QA audit reports.

Equipment calibration and maintenance records will be retained by a designated Parsons equipment manager for at least as long as the project files are retained.

FIGURE 7.1

CORRECTIVE ACTION REQUEST

Number _____ Date:_____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you (a) to resolve the noted conditions and (b) to prevent it from recurring. Your written response is to be returned to the Project quality assurance manager by _____.

Condition:

Reference Documents:

_____	_____	_____	_____	_____	_____
Originator	Date	Approval	Date	Approval	Date

Response

Cause of Condition:

Corrective Action

(A) Resolution:

(B) Prevention

(B2) Affected Documents

Signature_____ Date_____

CA Follow-up

Corrective Action verified by:_____ Date _____

APPENDIX G2

ANALYTICAL QUALITY ASSURANCE PROJECT PLAN (AQAPP)

APPENDIX G2

ANALYTICAL QUALITY ASSURANCE/QUALITY CONTROL PLAN FOR THE REMEDIAL ACTION AT EAST YARD, ASTORIA, NEW YORK

50% DESIGN SUBMITTAL

Prepared For:

Consolidated Edison Company of New York, Inc.

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Astoria, NY 11105

Prepared By:

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FEBRUARY 2015

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SECTION 1

PROJECT DESCRIPTION

1.1 INTRODUCTION

This Analytical Quality Assurance Project Plan (AQAPP) has been prepared in support of the ICM efforts at the Astoria East Yard (the Site). The AQAPP has been prepared in accordance with DER-10 Technical Guidance for Site Investigation and Remediation and the approved ICM Work Plan (ICMWP). This AQAPP should be used in conjunction with the 100% Remedial Design Report (RDR) including design drawings and technical specifications, the Construction Quality Assurance Project Plan (CQAPP), and the Construction Sampling and Analysis Plan (CSAP).

A detailed description of the site, the site history and background, and a description of the site-related contamination will be provided in Section 1 of the 100% RDR.

1.2 SUMMARY OF WORK ACTIVITIES RELATED TO SAMPLING/ ANALYSIS

The work activities relevant to this AQAPP include:

- Post-excavation confirmatory sampling of soil in the excavated areas;
- Offsite borrow source testing to ensure imported soils are not contaminated;
- Construction water analysis after treatment/prior to discharge or characterization for offsite disposal;
- Performing sample analysis and data review; and
- Performing data interpretation.

SECTION 2

DATA QUALITY OBJECTIVES

2.1 INTRODUCTION

The data produced during the ICM implementation will be compared with the defined Quality Assurance (QA) objectives and criteria for precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). These objectives are formulated to meet the requirements of the USEPA SW-846. The analytical methods and their Contract Required Quantitation Limits (CRQLs) are provided in Section 7.

2.2 DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) are based on the premise that different data uses require different levels of data quality. The term *data quality* refers to a degree of uncertainty with respect to PARCCS data quality indicators. Specific objectives are established to develop sampling protocols and identify applicable documentation, sample handling procedures, and measurement system procedures. These DQOs are established by onsite conditions, objectives of the project, and knowledge of available measurement systems. Overall project DQOs are presented and discussed in detail in this AQAPP. A wide range of data quality is achieved through the use of various analytical methods. The following data quality levels are widely accepted as descriptions of the different kinds of data that can be generated for various purposes:

- **Level I, Field screening or analysis using portable instruments (e.g., photoionization detector [PID]):** Results are often not compound-specific but results are available in real time. Depending on the analysis being performed and the instrumentation used, the results may be considered qualitative, semi-quantitative, or quantitative.
- **Level II, Field analysis using more sophisticated portable analytical instruments (e.g., on-site mobile laboratory):** There is a wide range in the quality of data that can be generated depending on the use of suitable calibration standards, reference materials, and sample preparation equipment. Results are available in real-time or typically within hours of sample collection.
- **Level III, All analyses performed in an off-site analytical laboratory using methods other than USEPA-approved analytical methods:** These data generally do not include the level of formal documentation required under Level IV and are not subject to formal data validation. These data are typically used for engineering studies (e.g., treatability testing), site investigations and remedial design.
- **Level IV, Data generated using USEPA methods and enhanced by a rigorous QA program, supporting documentation, and data validation procedures:** These data are typically used for engineering studies (e.g., treatability testing), risk assessment, site investigations, and remedial design, and may be suitable for litigation/enforcement activities. Results are both qualitative and quantitative.

The Site remedial activities will obtain Level I data quality for field screening with portable instruments such as a PID and dust monitor which will be used for health and safety and turbidity meter for field operational monitoring and/or monitoring additional field operational

parameters. This project will also obtain Level IV data quality for confirmatory bottom and sidewall sampling of excavations, and for construction water samples. All analyses will be conducted in accordance with the New York State Department of Environmental Conservations (NYSDEC) Analytical Services Protocol (ASP) and USEPA SW-846, 3rd edition, Test Methods for Evaluating Solid Waste, Physical and Chemical, revised March 2009, and the ICM Work Plan. Any subsequent revisions to the ASP or SW-846 supersede this information.

2.2.1 PARCCS Parameters (Data Quality Indicators)

2.2.1.1 Precision

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), absolute difference (D), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

The objectives for precision for each chemical are based on the capabilities of the approved EPA analytical method with respect to laboratory performance. For this project, field-sampling precision will be determined by analyzing coded (blind) duplicate samples for the same parameters, and then, during data validation, calculating the %RPD for duplicate sample results. The laboratory will determine analytical precision by calculating the %RPD or %D, as applicable to the analytical method being used, e.g., pH will be evaluated using %D.

The laboratory will determine analytical precision by calculating the RPD for the results of the analysis of the laboratory duplicates and matrix spike duplicates. The formula for calculating %RPD is as follows:

$$\%RPD = |V1 - V2| / (V1 + V2)/2$$

where:

RPD	=	Relative percent difference
V1, V2	=	Values to be compared
|V1 - V2|	=	Absolute value of the difference between the two values
(V1 + V2)/2	=	Average of the two values

For data evaluation purposes, in instances where both sample concentrations are less than five times (<5x) the RL, duplicate precision will be evaluated using the calculated %D result. In this instance, the applicable precision criterion will be two times the RL (2xRL). If a value is not detected, the %RPD criterion will be considered to be not applicable and the %RPD will not be calculated (i.e. precision will not be quantitatively determined). Tables 2.1 and 2.2 present the analytical evaluation for precision. For the evaluation of field duplicate precision, soil samples will be evaluated using a 50%RPD QC limit and aqueous samples will be evaluated using a 30%RPD QC limit.

2.2.1.2 Accuracy

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987) or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best

determined by the analysis of a sample containing a known quantity of material and is expressed as the percent of the known quantity that is recovered or measured. The recovery of a given analyte depends on the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes that are less than the quantitation limits are less accurate because they are more affected by such factors as instrument "noise." Higher concentrations will not be as affected by instrument noise or other variables and, thus, will be more accurate.

The objectives for accuracy for each chemical are based on the capabilities of the approved USEPA analytical method with respect to laboratory performance. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), the percent recoveries of matrix spike compounds added to selected samples, and the percent recoveries of spike compounds added to laboratory control samples (LCS), or matrix spike blanks (MSB). An LCS (or MSB) will be analyzed to provide additional information on analytical accuracy. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a *spike*, added to a sample (matrix spike or laboratory control). The accuracy on a per sample basis will be measured using surrogates for the organics analyses. Positive detects from the PCB analysis will be confirmed using second column confirmation. The laboratory will report the lower of the two values with respect to the dual GC column analysis performed. When the percent difference (%D) between the results for the two columns exceeds 25%, the laboratory will qualify the reported result with the *P* qualifier. The %R is calculated as follows:

Matrix Spike Recovery:

$$\%\ Recovery = \frac{SSR - SR}{\underset{\text{SA}}{SA}} \times 100$$

where:

% Recovery	=	Percent recovery
SSR	=	Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added
SR	=	Sample result: the background value; *i.e.,* the concentration of the analyte obtained by analyzing the sample
SA	=	Spiked analyte: concentration of the analyte spike added to the sample

Surrogate Recovery: % Recovery = $\frac{\text{Concentration (or amount) found}}{\text{Concentration (or amount) spiked}}$ x 100

LCS (or MSB) Recovery: % Recovery = $\frac{\text{Concentration (or amount) found}}{\text{Concentration (or amount) spiked}}$ x 100

Tables 2.1 and 2.2 present the analytical evaluation for accuracy.

2.2.1.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point or an environmental condition. Representativeness is a qualitative parameter and is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. An important factor in the selection of sample locations and sampling procedures will be obtaining representative samples.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree technically possible, that the data derived represents the in-place quality of the material sampled. Care will be exercised to see that chemical compounds are not introduced to the sample from sample containers, handling, and analysis. Field blanks, trip blanks, and laboratory method/prep blanks will be analyzed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded (blind) field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis such that the reported results are representative of the sample received. Chain-of-custody procedures will be followed to document the possession of sample containers from the time of container preparation through sample collection and receipt back at the laboratory. Field QC samples will be collected and analyzed to provide information to evaluate sample representativeness. Details of field QC sample collection (rinse blanks, trip blanks, temperature blanks, field duplicates) and chain-of-custody procedures are presented in Section 3.2.

2.2.1.4 Completeness

Completeness is defined as the percentage of measurements that meet the project's data quality objectives (USEPA, 1987). Completeness is calculated for each method (or analyte) and sample matrix for an assigned group of samples. Completeness for a data set represents the results usable for data interpretation and decision making. The completeness objective for the analytical and field data is 90%. Completeness is defined as follows for all sample measurements:

$$\%C = V / T\ (100)$$

where:

%C = Percent completeness

V = Number of measurements judged valid (not rejected during data validation)

T = Total number of measurements

Completeness, which is expressed as a percentage, is calculated by subtracting the number of rejected and unreported results from the total planned results and dividing by the total number of results. Results rejected because of out-of-control analytical conditions, severe matrix effects, broken or spilled samples, or samples that could not be analyzed for any other reason, negatively affect influence completeness and are subtracted from the total number of results to calculate completeness.

2.2.1.5 Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be managed by:

- Using identified standard methods (including laboratory standard operating procedures) for both sampling and analysis phases of this project
- Requiring traceability of all analytical standards and/or source materials to the USEPA or National Institute of Standards and Technology (NIST)
- Requiring that calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable)
- Using standard reporting units and reporting formats including the reporting of QC data
- Performing data validation on the analytical results, including the use of data qualifiers in all cases where appropriate
- Evaluating the sample collection information and analytical QC sample results
- Requiring that the significance of all validation qualifiers be assessed any time an analytical result is used for any purpose.

By taking these steps during the investigation, future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

2.2.1.6 Sensitivity and Quantitation Limits

When selecting an analytical method during the DQO process, the achievable detection limit (MDL) and method reporting limit (RL) must be evaluated to verify that the method will meet the project quantitation limits necessary to support project decision making requirements and determine compliance with regulatory thresholds. This process ensures that the analytical method sensitivity has been considered and that the methods used can produce data that satisfy users' needs while making the most effective use of resources. The concentration of any one target compound that can be detected and/or quantified is a measure of sensitivity for that compound. Sensitivity is instrument-, compound-, method-, and matrix-specific and achieving the required project quantitation limit (RL) and/or method detection limit (MDL) objectives depends on instrument sensitivity and potential matrix effects. With regard to instrument sensitivity, it is important to monitor the instrument performance to ensure consistent instrument performance at the low end of the calibration range. Instrument sensitivity will be monitored through the analysis of method/prep blanks, calibration check samples, and low standard evaluations.

Laboratories generally establish limits that are reported with the analytical results; these results may be called reporting limits, detection limits, quantitation limits, or other terms. These laboratory-specific limits, apply undiluted analyses and must be less than or equal to the project RLs. The RL, also known as the practical quantitation limit (PQL), represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and with confidence in both identification and quantitation. Throughout various documents RL and PQL may be interchanged, but they effectively have the same meaning. The RLs are established based on specific knowledge about the analyte, sample matrix, project specific requirements, and

regulatory requirements. The RL is typically established by the laboratory at the level of the lowest calibration standard and is generally in the range of two to ten times the MDL.

The method detection limit (MDL) is defined as "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero" (40 CFR 136 Appendix B). The MDL is the lowest concentration at which a specific analyte in a matrix can be measured and reported with 99% confidence that the analyte concentration is greater than zero. MDLs are experimentally determined and verified for each target analyte of the methods in the sampling program. The laboratory will determine MDLs for each analyte and matrix type prior to analysis of project samples. In addition, when multiple instruments are employed for the analysis of the same method, each individual instrument will maintain a current MDL study. MDLs are based on the results of seven matrix spikes at the estimated MDL, and are statistically calculated in accordance with the Title 40, Code of Federal Regulations Part 136 (40 CFR 136) Appendix B. The standard deviation of the seven replicates is determined and multiplied by 3.14 (i.e., the 99% confidence interval from the one-sided student t-test). If risk-based project objectives are developed, then where practicable, MDLs must be lower than the risk-based criteria determined for the project.

The MDLs to be used are intended to allow that both nondetected and detected target compound results will be usable to the fullest extent possible for the project. An MDL check sample an (interference-free MS with all method target compounds) must be analyzed following the MDL study to determine if reasonable MDL concentrations have been achieved. The MDL check sample should be at a concentration in the range of two to four times the MDL. If any target compound is not recovered, the MDL study must be repeated. In this case, the repeated MDL should be performed with a higher concentration, based on the analyst's judgment, of the target compounds that failed in the MDL check sample. MDLs must be determined annually at a minimum, and verified by analyzing an MDL check sample on each instrument used for the applicable method.

Laboratory RLs and MDLs for all analyses will meet at a minimum the standards criteria specified in the NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Restricted Residential Use, the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) “Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations”, the NYSDEC Division of Fish, Wildlife, and Marine Resources, “Screening and Assessment of Contaminated Sediment,” DRAFT 1/24/2013.

All analytical results will be reported to the MDL. Analytical results below the MDL will be flagged with a *U* at the RL for organics and MDL for metals to indicate the data are non-detect. However, the laboratory will flag analytes detected at a level less than the RL but greater than the MDL (or the laboratory’s determined minimum reportable concentration) with a *J* to denote an estimated concentration.

When results are corrected for dry weight, the reporting limits are then elevated accordingly. To compensate for the low solids, modifications are made either to increase the initial volume extracted/digested or to reduce the final volume of extract/digestate.

For samples that do not meet the project-specified RLs or MDLs, (taking into consideration elevated detection limits due to percent solids or percent moisture and aliquots used for the designated analysis), the laboratory must make available compelling documentation (e.g., screening data) and a justifiable explanation for its inability to meet the specified limits using the

project protocols. It must also provide an appropriate, justifiable explanation of the issues and resolution in the analytical report/data package (dilution factor, interference, etc.). Excessive, unnecessary dilutions on any sample for a project are unacceptable. The laboratory will analyze all samples initially undiluted, unless for GC/MS analyses (i.e., SW8260C and SW8270D), a preliminary GC-screen is performed and indicates that GC/MS instrument damage or compromise may occur if the sample is not analyzed initially at dilution. In this instance, the sample will be analyzed at the lowest possible dilution factor. If multiple extractions/ analyses are performed (such as undiluted and diluted analyses), resulting in several data sets for the same sample, the laboratory will report all data and results from each of the multiple analyses in the data package.

Quantitation limits for all definitive data quality level laboratory analytical methods, compounds, and matrices are presented in the NYSDEC ASP. Individual soil sample RLs and MDLs will be adjusted accordingly based on moisture and aliquots used for analysis.

TABLE 2.1
QUALITY CONTROL LIMITS FOR WATER SAMPLES

Analytical Parameter	Analytical Method (a)	Matrix Spike (MS) Compounds	MS/MSD (b) % Recovery	Duplicate RPD (c)	LCS (d) % Recovery	Surrogate	Surrogate % Recovery
VOCs	8260C	All target VOCs	Laboratory determined QC limits	≤50	Laboratory determined QC limits	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	Laboratory determined QC limits
SVOCs	8270D	All target SVOCs	Laboratory determined QC limits	≤50	Laboratory determined QC limits	Nitrobenzene-d5 2-Fluorobiphenyl Terphenyl-d14 Phenol-d5 2-Fluorophenol 2,4,6-Tribromophenol 2-Chlorophenol-d4 1,2-Dichlorobenzene-d4	Laboratory Determined QC Limits
PCBs	608/8082A	PCB-1016 PCB-1260	Laboratory determined QC limits	≤50	Laboratory determined QC limits	TCMX DCB	Laboratory determined QC limits
Metals	6010C/7470A	All target metals	75-125	≤20	85-115	NA	NA
Low Level Mercury	EPA 1631E	Mercury	71-125	≤24	85-115	NA	NA
TSS	USEPA 160.2	TSS	80-120	≤20	80-120	NA	NA
Oil and Grease	USEPA 413	Oil and grease	80-120	≤20	80-120	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, revised March 2009; subsequent revisions supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
NA - Not Applicable

TABLE 2.2

QUALITY CONTROL LIMITS FOR SOIL/WASTE SAMPLES

Analytical Parameter	Analytical Method (a)	Matrix Spike (MS) Compounds	MS/MSD (b) % Recovery	Duplicate RPD (c)	LCS (d) % Recovery	Surrogates	Surrogate % Recovery
VOCs/TCLP VOCs	8260C	All target VOCs	Laboratory determined QC limits	≤50	Laboratory determined QC limits	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	Laboratory determined QC limits
SVOCs/TCLP SVOCs	8270D	All target SVOCs	Laboratory determined QC limits	≤50	Laboratory determined QC limits	Nitrobenzene-d5 2-Fluorobiphenyl Terphenyl-d14 Phenol-d5 2-Fluorophenol 2,4,6-Tribromophenol 2-Chlorophenol-d4 1,2-Dichlorobenzene-d4	Laboratory Determined QC Limits
Pesticides/TCLP Pesticides	8081B	All target pesticides	Laboratory determined QC limits	≤50	Laboratory determined QC limits	TCMX DCB	Laboratory determined QC limits
Herbicides/TCLP Herbicides	8151A	All target herbicides	Laboratory determined QC limits	≤50	Laboratory determined QC limits		Laboratory determined QC limits
TAL Metals/TCLP Metals	6010C/7470A	All target metals	75-125	≤20	85-115	NA	NA
PCBs	8082A	PCB-1016 PCB-1260	Laboratory determined QC limits	≤50	Laboratory determined QC limits	TCMX DCB	Laboratory determined QC limits
Ignitiablility, Corrosivity, Reactivity	1010B/9045/9012B/9030	NA	NA	≤20	80-120	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, revised March 2009, subsequent revisions supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
NA-Not Applicable

SECTION 3

DATA ACQUISITION

3.1 SAMPLING METHODS

Any non-disposable sampling equipment used for chemical sampling will be cleaned and decontaminated prior to use to prevent potential cross-contamination between each use. Additionally, this AQAPP describes management, handling, and tracking procedures for investigation-derived waste, including solid and liquid materials, and personal protective equipment.

The special precautions described here will be taken to confirm that each sample collected is representative of the conditions at that location and that the sampling and handling procedures neither alter nor contaminate the sample. If failure in the sampling or measurement system occurs, the procedures specified in Section10.3 of this AQAPP will be followed to identify who is responsible for implementing the appropriate corrective action. This section presents sample container preparation procedures, sample preservation procedures, and sample holding times.

For this program, the laboratory will purchase and distribute certified clean sample containers with chemical preservatives. The sample containers used for chemical analysis must be virgin bottleware, I-Chem^{TM} Series 300 (or equivalent). Vendors are required to provide documentation of analysis for each lot of containers, and the documentation will be kept on file at the laboratory. Alternatively, the laboratory may perform testing to certify that the sample containers are not contaminated. Since the containers supplied by the laboratory will be certified clean, the bottles will not be rinsed in the field prior to use.

Laboratory-supplied sample kits (coolers containing field chain-of-custody forms, custody seals, sample containers, preservatives, and packing material) will be prepared by the laboratory's Sample Management Staff and shipped to the Field Team Leader. The type of containers, required sample volumes, preservation techniques, and holding times for specific analyses are presented in the NYSDEC ASP.

Samples requiring chemical preservation will be collected in sample containers provided by the analytical laboratory that already contain sufficient quantities of the appropriate preservative(s) to ensure that the sample is kept in accordance with the method requirements. The laboratory must provide an adequate amount of pre-preserved bottles with traceable high-purity preservatives, and additional preservative for use if the added amount is not sufficient, based on request by the Field Team Leader and on an as-needed basis if additional bottleware is needed during the field activities. The field team must verify that the preservative has been added appropriately.

3.2 SAMPLE HANDLING AND CUSTODY

This section presents sample handling and custody procedures for both the field and laboratory. Implementation of proper handling and custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the chain of custody and transfer of samples will be trained as to the purpose and procedures prior to implementation. For transfer of samples within the laboratory, an internal chain of custody will be required.

3.2.1 Sample Handling

Samples to be collected for each work assignment will be specified in the work plan and FSP. After the samples are collected, they will be split as necessary among preserved containers appropriate to the parameters to be analyzed. Each container will be provided with a sample label that will be filled out at the time of collection. The sampler will print label information, specified below, on each label either before or immediately after collecting the sample with an indelible writing instrument. The label will be protected from water and solvents with clear label packing tape.

The following information, at a minimum, is required on each sample label (note: the location ID and the sample ID as described in the Data Management section below inherently identify some of this information, see below):

- Client
- Project name
- Sampling location
- Sample number
- Date and time of sample collection
- Parameters to be analyzed
- Preservative(s) added, if any
- Initials of the sampler.

Following sample collection, excess soil, water, etc., will be wiped from the outside of the sample containers with a paper towel and the lids will be checked to verify they are tightly closed. Each glass container will be wrapped with bubble wrap to minimize breakage during transport. Bottles containing soil, sediment, and water samples will be placed in separate Ziploc® bags (one bag) and set on ice (ice bath not necessary). Documentation of equipment and methods used in the field for treating the samples will be maintained in the field logbooks, and a chain of custody will be initiated to document transfer of the samples from the field team to the laboratory. In preparation for shipment to the analytical laboratory, the shipment cooler will be packaged as follows:

- Fill a dry shipment cooler with inert cushioning to a depth of 1 inch to prevent bottle breakage.
- Place the bagged samples and the laboratory-provided temperature blank upright in the sample cooler. The temperature blank should be placed in the center (horizontally and vertically) with the samples surrounding.
- Place additional cushioning material around the sample bottles as necessary.
- Place bags of ice in the remaining void space to keep the samples cooled to 4°C.
- Complete the chain-of-custody form (see Section 3.2.2). Place the chain-of-custody form in a polyethylene, sealable bag (such as a 1-gal Ziploc® bag or equivalent) and tape the bag to the interior of the cooler lid. Field personnel retain a copy of the chain-of-custody form; another copy is transmitted to the QAO and the Project Manager specified in the work plan.

- Prior to sealing for shipment, the list of samples will be checked against the container contents to verify the presence of each sample listed on the chain-of-custody record including the temperature blank.
- Affix a custody seal to the cooler.
- Seal the cooler securely with packing tape, taking care not to cover labels if already present.
- Label the cooler appropriately in accordance with the Department of Transportation (DOT) regulations (49 CFR 171 through 179).
- Ship the samples in accordance with the DOT requirements outlined in 49 CFR 171 through 179. Complete the carrier bill of lading, and retain a copy on file.
- Samples will be delivered to the laboratory by the most expedient means to meet holding times. Whenever practicable, samples will be shipped on the day of collection for delivery to the laboratory the morning of the day after collection. The laboratory will be required to adhere to the holding times as stated in the NYSDEC ASP for sample analyses. Laboratory performance requirements for analysis turnaround time will be established using the validated time of sample receipt (VTSR) in accordance to NYSDEC requirements. The field team will carefully coordinate sampling activities with the laboratory to see that holding times are met.

The required holding times must be adhered to for the initial sample preparation/analysis. If subsequent reanalysis or re-extraction becomes necessary because of method requirements or additional requirements stated here, the laboratory will make every effort to perform those re-extractions and/or reanalysis within the primary holding times. Any holding time that is exceeded will be reported immediately to the Project Manager and the QAO by the laboratory QA manager.

3.2.2 Field Sample Custody

The primary objective of sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of samples from the moment of their collection through analysis until their final disposition. A sample (or sample container) will be considered under custody if:

- In a person's possession
- Maintained in view after possession is accepted and documented
- Locked and tagged with custody seals placed on the sample cooler so that no one can tamper with it after having been in physical custody
- In a secured area that is restricted to authorized personnel.

The sample custody flowchart is shown in Figure 3.1.

DATA REQUIRED ON CHAIN-OF-CUSTODY*
Project name and client
Signatures of samplers
Sample number, date and time of collection, and grab or composite sample designation
Signatures of individuals involved in sample transfer
If applicable, the air bill or other shipping number
ADDITIONAL ITEMS THAT SHOULD BE INCLUDED:
Sample matrix
Number of sample containers
Analyses to be performed,
Preservative(s)
Name of the analytical laboratory to which the samples are sent
Method of sample shipment
Project number.
*Required by guidance in SW846 Test Methods for Evaluating Solid Waste, Physical and Chemical (USEPA, 1997)

A chain-of-custody record will accompany the samples from the time the samples leave the original sampler's possession through the sample shipments' receipt at the laboratory. Triplicate copies of the chain-of-custody record must be completed for each sample set collected. See chart for data requirements.

If samples are split and sent to different laboratories, a copy of the chain-of-custody record is sent with each sample.

The REMARKS space on the chain-of-custody form is used to indicate if the sample is a matrix spike/matrix spike duplicate (MS/MSD) or matrix spike/matrix duplicate (MS/MD), or any other sample information for the laboratory. Since they are not specific to any one-sample point, blanks are indicated on separate rows. Immediately prior to sealing the sample cooler, the sampler will sign the chain-of-custody form and write the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper air bill number on the top of the chain-of-custody form. Mistakes will be crossed out with a single line in ink and initialed by the author.

Sampling personnel will retain one copy of the chain-of-custody form, and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs his or her name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. Field personnel then relinquish the cooler to personnel responsible for shipment, typically an overnight carrier.

The chain-of-custody seal must be broken to open the sample cooler. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Field Team Leader for direction on whether to proceed with the analyses.

Sampling personnel record the information placed on the chain-of-custody record in the field logbook. They also include in the log book a detailed description of the exact locations from which the samples were collected, any pertinent conditions under which the samples were obtained, and the lot number of the containers used.

3.2.3 Laboratory Sample Management

The laboratory has a designated Sample Management Staff responsible for receiving samples in the laboratory, opening the coolers, checking the sample integrity and custody seals, logging samples into the laboratory information management system (LIMS), and controlling the handling and storage of samples while in the laboratory. The laboratory is a secure facility and only authorized laboratory personnel are allowed to handle active samples. The laboratory maintains an SOP for sample management.

3.2.4 Sample Receipt and Logging

Upon receipt at the laboratory, sample-receiving personnel inspect the samples for integrity of the custody seal, check the shipment against the chain-of-custody form, and note any discrepancies. Specifically, the sample-receiving personnel note any damaged or missing sample containers. At this time, the field chain-of-custody record is completed and signed by the Sample Management Staff.

Using the temperature blank in each cooler, the temperature of each incoming sample cooler is measured and recorded during the sample receipt and log-in procedures before samples are placed in laboratory cold storage. Similarly, the laboratory documents that its cold storage facilities are being maintained through daily (at a minimum) documented temperature measurements using a thermometer.

Upon receipt, Sample Management Staff measure and record on the preservation documentation sheet the pH of acid- or base-preserved aqueous samples. Any problems observed during sample receipt must be communicated to the Field Team Leader and/or the QAO verbally and either by fax transmission or email within 24 hr (preferably 3 hr beginning with the normal business day or immediately following for problems noted during second shifts or weekends) after discovery and before samples are released to the laboratory for analysis. Problems may include but are not limited to broken bottles, errors or ambiguities in paper work, insufficient sample volume or weight, inappropriate pH, and elevated temperature.

When the shipment is inspected and the chain-of-custody record agree, the sample receiving personnel enter the sample and analysis information into the LIMS and assign each sample a unique laboratory number. This number is affixed to each sample bottle.

3.2.5 Sample Storage Security

While in the laboratory, the samples and aliquots that require cold storage will be stored and will be maintained in a secured refrigerator unless they are being used for preparation and/or analysis. All of the refrigerators in the laboratory used for storage of samples have restricted access and are numbered. In addition, dedicated refrigerators are designated for extracts and analytical standards. The sample storage areas are in the laboratory, and access is limited to laboratory personnel. Specific requirements for sample storage are described below:

- Samples will be removed from the shipping container and stored in their original containers unless damaged.

- Damaged samples will be disposed in an appropriate manner, and the disposal will be documented or repacked as necessary and appropriate.
- Samples and extracts will be stored in a secure area designed to comply with the storage method(s) defined in the contract.
- The storage area will be kept secure at all times. The sample custodian or designated personnel will monitor access to the storage area.
- Standards or reagents will not be stored with samples or sample extracts.

The following standard operating procedures for laboratory sample security will be implemented to confirm that the laboratory satisfies sample chain-of-custody requirements:

- Samples will be stored in a secure area.
- Access to the laboratory will be through a monitored area. Other outside access doors to the laboratory will be kept locked.
- Visitors must sign a visitor's log and will be escorted while in the laboratory.
- Refrigerators, freezers, and other sample storage areas will be securely maintained.

Storage blanks will be initiated and analyzed on a weekly basis for each cold storage unit used to hold samples submitted for the analysis of VOCs. Field QC samples must be stored in the same cold storage units as the samples that they are associated with (even if the matrices are different). All soil samples must undergo thorough sample homogenization (stirred within the original sample container) using inert utensils and mixing platforms that will not interfere with the target analytes being requested for analysis with the exception of soil samples submitted for the analysis of VOCs. Samples for VOC determinations will be stored in a secure refrigerator separate from other samples, sample extracts, reagents, and standards.

3.2.6 Retention and Disposal of Samples

The laboratory must retain all excess samples within their original sample bottles for a minimum of 30 days in cold storage (below 4 degrees Celsius) following submission of the validated data to NYSDEC. At that time, the laboratory must contact the Field Team Leader for authorization for responsible disposal or further storage instructions. At the point at which the laboratory is provided authorization to dispose of the samples, the laboratory will be responsible, and will assume all liability for proper characterization and disposal of samples and bottleware in accordance with all local, state, and federal regulations.

FIGURE 3.1

SAMPLE CUSTODY FLOW CHART

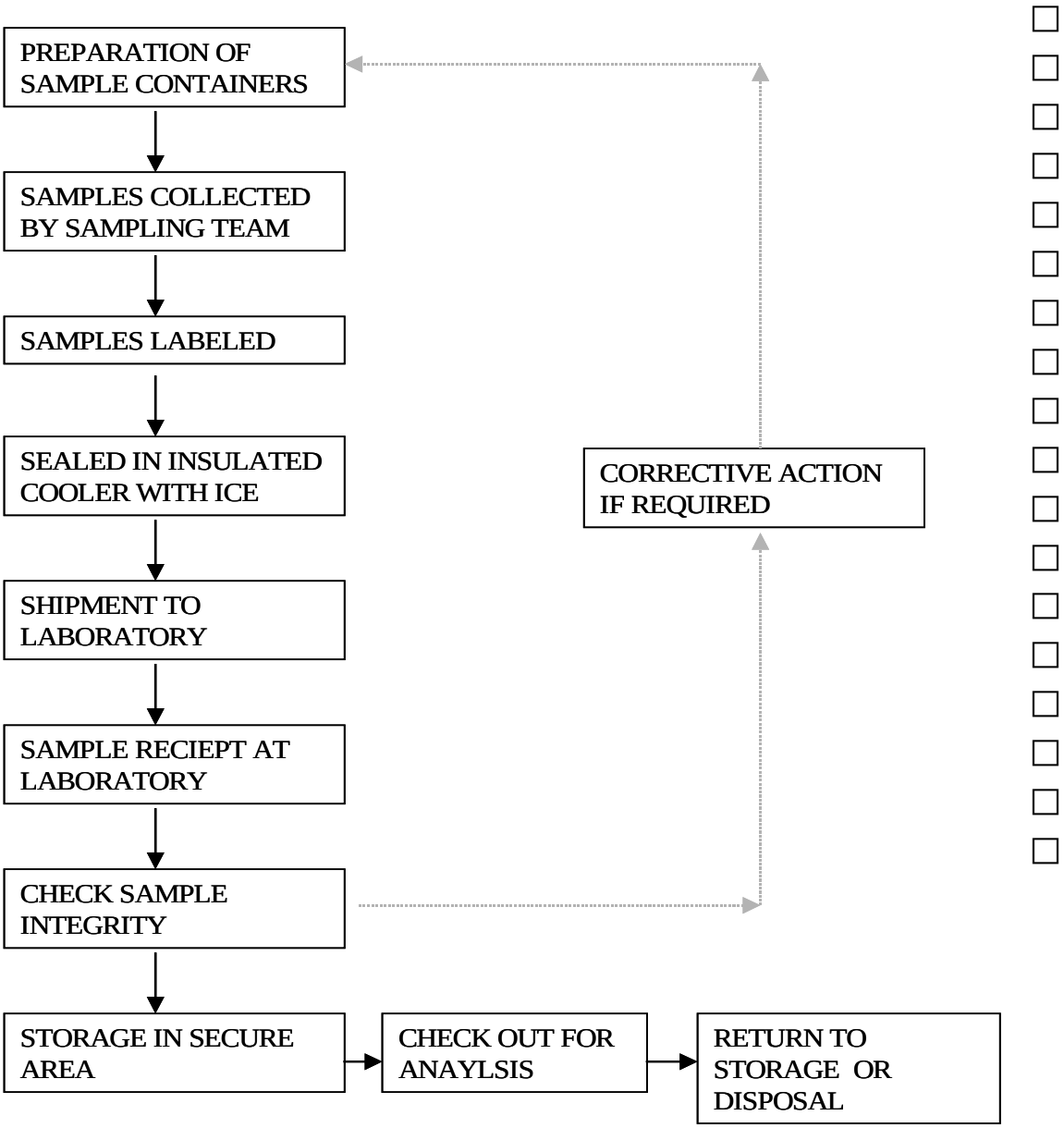
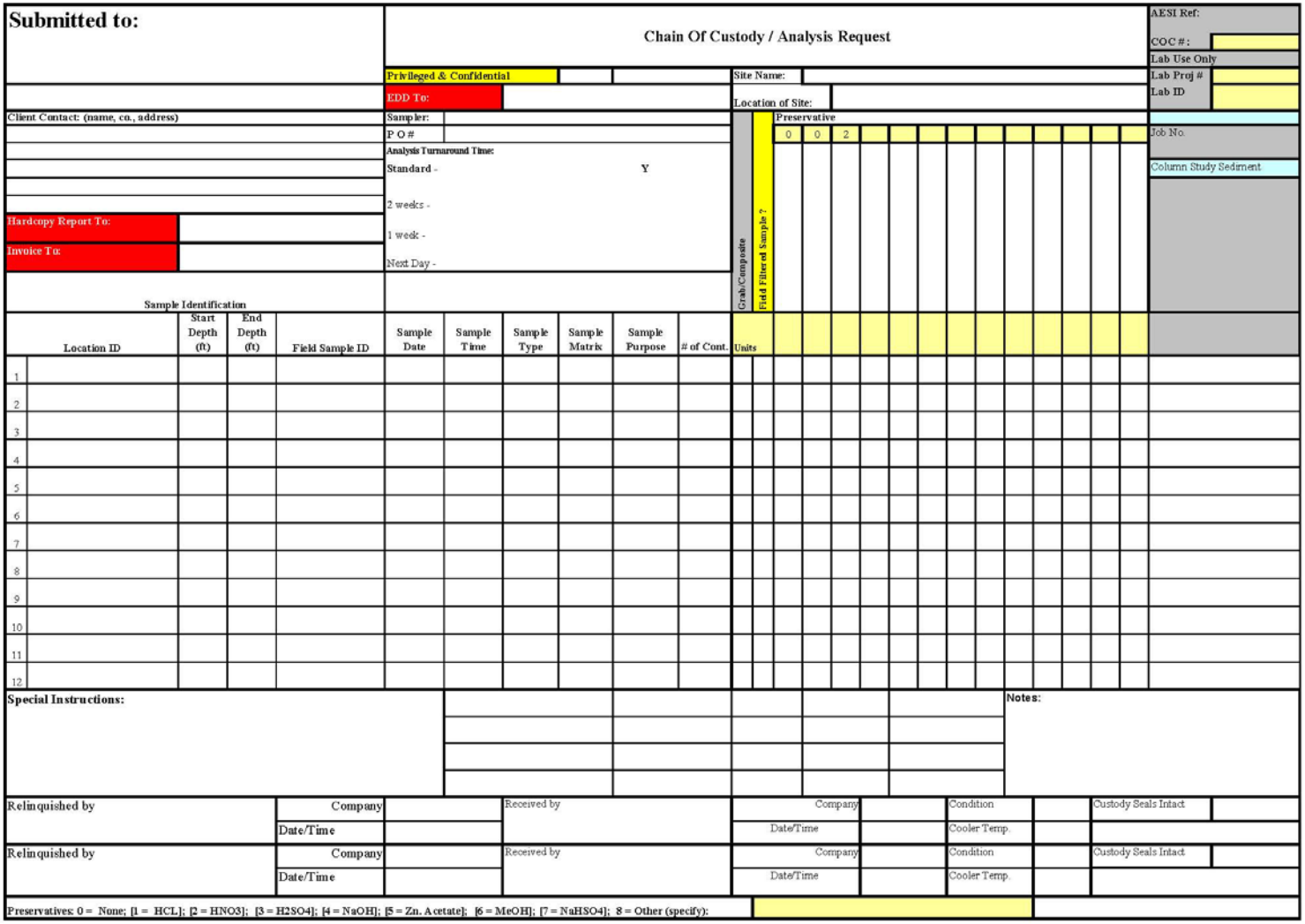


FIGURE 3.2 EXAMPLE CHAIN-OF-CUSTODY RECORD



Submitted to:

Chain Of Custody / Analysis Request

AESI Ref:
COC #:
Lab Use Only
Lab Proj #
Lab ID

Privileged & Confidential
EDD To:
Site Name:
Location of Site:

Client Contact: (name, co., address)
Sampler:
P O #
Analysis Turnaround Time:
Standard - Y
2 weeks -
1 week -
Next Day -

Hardcopy Report To:
Invoice To:

Preservative: 0 | 0 | 2

Job No.
Column Study Sediment

Grab/Composite
Field Filtered Sample ?

Sample Identification

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.	Units
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Special Instructions:

Notes:

Relinquished by	Company		Received by	Company		Condition	Custody Seals Intact
	Date/Time			Date/Time		Cooler Temp.	
Relinquished by	Company		Received by	Company		Condition	Custody Seals Intact
	Date/Time			Date/Time		Cooler Temp.	

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn. Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

3.3 SAMPLE CONTAINER PREPARATION AND SAMPLE PRESERVATION

Sample containers will be properly washed and decontaminated prior to their use by either the analytical laboratory or the container vendor to the specifications required by the USEPA SW-846 and NYSDEC ASP. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used to obtain samples. The containers will be tagged and the appropriate preservatives will be added. The types of containers and preservation techniques shall be in accordance with Tables 3.1 and 3.2.

Following sample collection, the sample bottles should be placed in the shipping cooler, cooled to 4^{o}C with ice, and delivered to the laboratory within 24 hours of collection. Every effort will be made, to the extent practical, to ship samples on the day of collection and have the samples delivered to the laboratory in the morning of the day after collection. Samples designated for Saturday delivery may not arrive at the laboratory until Monday.

3.4 SAMPLE HOLDING TIMES

The sample holding times for organic and inorganic parameters are given in Tables 3.1, 3.2, and 3.3. These holding times must be strictly adhered to by the laboratory. Any holding time exceedances must be reported to the Project Quality Assurance Officer.

3.5 FIELD QC SAMPLES

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and matrix spike/ matrix spike duplicates (MS/MSDs). The blanks will include:

- Trip Blanks - A trip blank will be prepared before the sample containers are sent by the laboratory. The trip blank will consist of a 40-ml VOA vial containing distilled, deionized water, which accompanies the other aqueous sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for target compound list (TCL) volatiles analysis. The trip blank will be analyzed for TCL volatile organic compounds to access any contamination from sampling and transport, and internal laboratory procedures.
- Field Blanks - Field blanks will be taken at a frequency of one per decontamination event, maximum of one day per sampling equipment type, minimum of one per week. Field blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. It is a sample of deionized, distilled water provided by the laboratory, which has passed through a decontaminated bailer or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The field blank may be analyzed for all of the parameters of interest.

The duplicates will consist of:

- Coded Field Duplicate - To determine the representativeness of the sampling methods, coded field duplicates will be collected at a frequency of one per 20 environmental samples per matrix. The samples are termed "coded" because they will be labeled in

such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise.

- Matrix Spike/Matrix Spike Duplicate (MS/MSD) - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The percent recoveries and RPDs are presented in Tables 2.1 and 2.2.

TABLE 3.1

WATER SAMPLE CONTAINERIZATION, PRESERVATION, AND HOLDING TIMES

Analysis	Bottle Type	Preservation (a)	Holding Time (b)
pH	60 mL plastic bottle	Cool to 4°C	Analyze Immediately
Oil and Grease	Two 1000 mL glass w/Teflon lined cap	H2SO4 to pH<2 Cool to 4°C	28 Days
Total Suspended Solids (TSS)	250 mL plastic bottle	Cool to 4°C	7 Days
PCBs	Two 1000 mL glass w/ Teflon lined cap	Cool to 4°C	7 Days*
VOCs	Two 40 mL glass vials w/Teflon septums	HCI to pH<2 Cool to 4°C	12 Days
SVOCs	Two 1000 mL glass w/ Teflon lined cap	Cool to 4°C	7 Days*
Metals	250 mL plastic bottles	Nitric Acid to pH <2 Cool to 4°C	6 Months, Except Mercury (26 days)
Low Level Mercury	500 mL flouoropolymer bottles	BrCl to pH <2 Cool to 4°C	28 days (48 hours if unpreserved)

(a) All samples to be preserved on ice during collection and transport.

(b) Days from sample collection.

* Extraction of water samples for SVOC and PCB analysis must be completed within 7 days. Extracts of water samples must be analyzed within 40 days.

PCBs - Polychlorinated Biphenyls

VOCs - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

TABLE 3.2

SOIL AND WASTE SAMPLE CONTAINERIZATION AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
PCBs	Wide-mouth glass w/ teflon lined cap	Cool to 4ºC	14 days*
TCLP VOCs	Wide-mouth glass w/Teflon® lined cap	Cool to 4°C	See Table 3.3
TCLP SVOCs	Wide-mouth glass w/Teflon® lined cap	Cool to 4°C	See Table 3.3
TCLP Pesticides	Wide-mouth glass w/Teflon® lined cap	Cool to 4°C	See Table 3.3
TCLP Herbicides	Wide-mouth glass w/Teflon® lined cap	Cool to 4°C	See Table 3.3
TCLP Metals	Wide-mouth plastic or glass	Cool to 4ºC	See Table 3.3
Corrosivity, Ignitability, Reactivity	Wide-mouth glass	Cool to 4°C	7 days

[a]All samples to be preserved on ice during collection and transport.

[b]Days from sample collection.

*Sohxlet or sonication procedures for extraction and concentration of soil/sediment samples for PCBs must be completed within 14 days. Extracts of soil/sediment samples must be analyzed within 40 days.

PCBs - Polychlorinated Biphenyls

TCLP - Toxicity Characteristic Leaching Procedure

VOCs - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

TABLE 3.3

TCLP SAMPLE HOLDING TIME REQUIREMENTS

	From Field Collection to TCLP Extraction	From TCLP Extraction to Preparative Extraction	From Preparative Extraction to Analysis
Analysis			
Volatiles	14 days	N/A	14 days
Semivolatiles	14 days	7 days	40 days
Pesticides	14 days	7 days	40 days
Herbicides	14 days	7 days	40 days
Metals (except mercury)	6 months	N/A	6 months
Metals (mercury)	28 days	N/A	28 days

Notes: TCLP - Toxicity Characteristic Leaching Procedure

N/A - Not applicable

□

SECTION 4

DATA MANAGEMENT

4.1 INTRODUCTION

The electronic data management systems for each work assignment will be implemented to process the information effectively without loss or alteration. As of April 1, 2011, the New York State Division of Environmental Remediation (DER) has implemented an Environmental Information Management System (EIMS). The EIMS uses the database software application EQuIS™ from EarthSoft® Inc. In an effort to improve the management of environmental data and reduce paper quantities, all laboratory analytical data minus instrument raw data must be submitted in the DEC-approved Electronic Data Deliverable (EDD).

Data providers must download and install the EQuIS Data Processor (EDP) to check their properly formatted EDD as well as the NYSDEC DER Format file. The EDP performs a series of formatting checks on the EDD and identifies any errors in the data file prior to submission. All EDDs are to be error free when submitted. It is important that the most recent version of the EDP and NYSDEC format file are employed since the valid values used by EIMS are periodically updated for the EDP.

4.2 FIELD DATA MANAGEMENT

The Field Team Leader will manage data generated in the field. He or his designee will be responsible for recording and documenting sampling activities in the field logbook, on sampling records (as appropriate), and on chain-of-custody forms (when samples are collected) as described in Section 3.2.2. The records may be photocopied and stored in the project file along with the original.

A sample nomenclature system will be coordinated with the Data Management Team. Each sample name will be unique to include location ID and field sample ID. The Database Manager will add data to EIMS through the input module of the system.

DATA INPUT TO EIMS MAY INCLUDE:
– Sample planning information (e.g., sample depth) – Chain-of-custody data – Sediment coring logs – Geotechnical data – Location and geographic data – Field measurements – Meteorological data – Waste characterization data – Groundwater levels – Radiodating data – Laboratory analytical data

4.3 LABORATORY DATA MANAGEMENT

Laboratory data management involves several important stages that include data transformation, review, verification, and validation, as well as data storage, retrieval, and security. The laboratory will implement a data management system to manage the data from its generation in the laboratory to its final reporting and storage. The data management system will include, but not be limited to, the use of standard record-keeping practices, standard document control systems, and the electronic data management system.

The laboratory data reduction, verification, validation, and reporting procedures and project data management activities, data/information exchange procedures ensure that complete documentation is maintained, transcription and reporting errors are minimized, and data are properly review.

SECTION 5

DOCUMENTS AND RECORDS

5.1 INTRODUCTION

Records will be maintained to document accurately the data generation process during investigation in the field, sample analysis in the lab, and during data validation. Project documentation will be maintained in general accordance with guidelines in the National Enforcement Investigation Center Policies and Procedures (USEPA, 1986). A project file will be maintained that will contain appropriate project documentation; see components in chart. Some of this documentation may be retained electronically in lieu of paper copies. Table 5.1 summarizes the types of project documents and records.

MINIMUM COMPONENTS OF PROJECT FILE
- Project plans and specifications
- Field logbooks and data records
- Photographs, maps, and drawings
- Sample identification documents
- Chain-of-custody records
- Data review notes
- Report notes and calculations
- Progress and technical reports and Correspondence and other pertinent information
- Full analytical data deliverables package provided by the lab, including QC documentation and electronic data deliverable

5.2 FIELD RECORDS

Field personnel are responsible for documenting sample handling activities, observations, and data in field sampling records including field logbooks, chain-of-custody records, photographs, and pre-design investigation records. The Field Team Leader is responsible for maintaining these documents. Each record is described below.

5.2.1 Field Logbook

A Field Logbook will be used to document pre-design investigation activities. The field logbook will have consecutively numbered pages, and documentation will be recorded using waterproof ink. Incomplete lines, pages, and changes in the logbook will be lined out with a single line, dated, and initialed. More detailed procedures for documenting investigation activities (such as field sampling records and boring log forms) and type of information to include in the field logbook may be developed.

MINIMUM REQUIREMENT FOR INFORMATION IN FIELD LOG
- Responsible person's name - Date and time of activity - Equipment and methods used for field preparation of samples - Field measurements of samples (*e.g.*, pH, temperature) - Information coordinating sample handling activities with appropriate field activities and chain-of-custody documentation *Daily calibration activities:* - Calibrator's name - Instrument name and model - Date and time of calibration - Standards used and their source - Temperature (if appropriate) - Results of calibration - Corrective actions taken (if any)

5.2.2 Electronic Field Data Management

The field sampling program will have an electronic data management component. The system will be designed to specify the necessary samples taken at any given location and to provide the ability to be updated and amended in the field. This will provide a management system that efficiently tracks the needs of the sampling scope. As the samples are taken, log entries are put in the database, and sample labels are printed. At any given time a chain-of-custody record can be printed as well.

5.2.3 Chain-of-Custody Record

The chain of custody record establishes the documentation necessary to trace sample possession from the date and time of sample collection, through sample shipment, to the date and time of arrival at the laboratory designated to perform analysis. The ability to trace the history of a sample is essential to show that the sample collected was, indeed, the sample analyzed and that the sample was not subjected to biasing influences. Evidence of sample traceability and integrity is provided by chain-of-custody procedures. These procedures are necessary to support the validity of the data and will accompany each shipping container.

A copy of the chain-of-custody record will be detached and kept with the field logbook or placed in the project file; the original record will accompany the shipment.

5.3 LABORATORY RECORDS

Laboratories providing analytical support for this project must maintain records to ensure that all aspects of the analytical processes are adequately documented to ensure legal defensibility of the data.

When a mistake is made, the wrong entry is crossed out with a single line, initialed, and dated by the person making the entry, and the correct information recorded. Obliteration of an incorrect entry or writing over it is not allowed, nor is the use of correction tape or fluid on any laboratory records.

Overwriting or disposal of any electronic media prior to a 5-yr expiration period is strictly prohibited. All electronic and hardcopy data must be stored in an easily accessible climate-controlled environment. The laboratory will exercise "best practices" in terms of frequent, redundant electronic backup procedures on proper long-term storage media to assure that all electronic data representing Honeywell sample analyses will be maintained for the 5-yr storage period. Electronic data must be stored in a secure, limited-access area with redundant copies stored in fireproof vaults and/ or stored off-site of the laboratory facilities.

Sample preparation in the laboratory must be fully documented and include sample preparation conditions (such as digestion temperatures). In addition, documentation must allow complete traceability to all prepared or purchased reagents, acids and solvents, and reference solutions. All spike solutions and calibration standards must be used prior to labeled expiration dates and stored in accordance with manufacturers recommended conditions. Complete and unequivocal documentation must exist to enable traceability of all prepared spike solutions, calibration standards, and prepared reagents back to the reference materials utilized. Organic extracts must be stored in the same type of vials (amber or clear) as the associated standards at the appropriate storage temperatures.

The unit conventions set forth in the figures for reported data will be consistent with standard laboratory procedures. Reporting units used are those commonly used for the analyses performed. Concentrations in soil and sediment samples will be expressed in terms of weight per unit dry weight, with moisture content reported for each sample.

Laboratory records used to document analytical activities in the laboratory will include reagent and titrant preparation records, standard preparation logs, sample preparation logs, bench data sheets, instrument run logs, and strip chart recordings/chromatograms/computer output. Additional records will include calibration records, maintenance records, nonconformance memos, and Corrective Action Request (CAR) forms.

LAB RECORDS SHOULD CONVEY:
- What was done - When it was done - Who did it and - What was found
REQUIREMENTS FOR LAB RECORDKEEPING
- Data entries must be made in indelible water-resistant ink - Date of each entry and observer must be clear - Observer uses his or her full name or initials - Initial and signature log is maintained so the recorder of every entry can be identified - Information must be recorded in notebook or on other records when the observations are made - Recording information on loose pieces of paper not allowed

5.3.1 Operational Calibration Records

Operational calibration records will document the calibration of instruments and equipment that are corrected on an operational basis. Such calibration generally consists of determining

instrumental response against compounds of known composition and concentration or the preparation of a standard response curve of the same compound at different concentrations. Records of these calibrations are maintained in the following documents:

- Standard preparation information, to trace the standards to the original source solution of neat compound, is maintained in LIMS or laboratory standard preparation logs.
- Instrument logbook provides an ongoing record of the calibration for a specific instrument. The logbook should be indexed in the laboratory operations records and should be maintained at the instrument by the chemist. The chemist must sign and date all entries, and the QM or his designee must review them.
- For Level IV data packages, copies of the raw calibration data will be kept with the analytical sample data so the results can readily be processed and verified as one complete data package. If samples from several projects are processed together, the calibration data is copied and included with each group of data. The laboratory will maintain all calibration, analysis, and corrective action documentation (both hard copy and electronic data) for a minimum of 7 years. The documentation maintained must be sufficient to show all factors used to derive the final (reported) value for each sample. Documentation must include all calculation factors such as dilution factor, sample aliquot size, and dry-weight conversion for solid samples. The individual who performs hand calculations must sign and date them. This documentation must be stored with the raw data. Calculations performed by the data system will be documented and stored as electronic and hard copy data. The instrument printouts will be kept on file, and the electronic data will be stored by the laboratory for a minimum of 7 years.

5.3.2 Maintenance Records

Maintenance records will be used to document maintenance activities, service procedures, and schedules. They must be traceable to each analytical instrument, tool, or gauge. The individual responsible for the instrument must review, maintain, and file these records. These records may be audited by the QAO to verify compliance. Logs must be established to record and control maintenance and service procedures and schedules.

5.3.3 Nonconformance Memos

Nonconformance Memos (NCM) may be either a hard copy record or an electronic database record. In either case, review and release of the record must be documented by the initiator, the analytical group leader where appropriate, the laboratory project manager, and the laboratory QA manager. All internal laboratory nonconformance documentation will be communicated to the Field Team Leader by the laboratory project manager verbally and summarized in the report narrative. The NCM will be used to document equipment that fails calibration and will identify any corrective actions taken.

5.3.4 Corrective Action Request (CAR) Forms

The laboratory must use CAR forms to document any incidents requiring corrective action. The CAR form will be issued to the personnel responsible for the affected item or activity. A copy will also be submitted to the laboratory project manager. The individual to whom the CAR is addressed will return the requested response promptly to the QA personnel and will affix his or her signature and date to the corrective action block after stating the cause of the conditions and

corrective action to be taken. QA personnel will maintain a log for status of CAR forms to confirm the adequacy of the intended corrective action and to verify its implementation. CARs will be retained in the project record file.

5.3.5 Analytical Data Reports

Analytical data will be reported as an Electronic Data Deliverable (EDD) and as an analytical data package (two copies on CD-Rom and one hard copy). The analytical laboratories are required to submit all data, preliminary and final, in formatted EDDs in accordance with NYSDEC's requirements. The laboratory must meet 100% compliance with these requirements. The Parsons Database Manager will submit written requests dictating the requirements and appropriate files to be supplied by the laboratory. The specifications of the EDD are presented in Section 4.

Analytical data reports will be provided by the laboratory within 28 calendar days following receipt of a complete Sample Delivery Group (SDG). An SDG is considered to include all samples received for the same project or site, to a maximum of twenty investigative samples not to exceed 5 consecutive days of sampling. The data package provided by the laboratory will be Level IV, unless an alternative requirement is specified in a laboratory statement of work (SOW) and will contain all information to support the data validation in accordance with the USEPA Region II Standard Operating Procedures (SOP) as described in Section 8. Additionally, the completed copies of the chain-of-custody records, accompanying each sample from the time of initial bottle preparation to completion of analysis, must be attached to the analytical reports.

5.4 DATA VALIDATION AND AUDIT RECORDS

Data validation personnel are responsible for documenting validation procedures and results in the form of a data usability summary report (DUSR). The QAO will be responsible for maintaining this report and the QAO will be responsible for its distribution. Additionally, audit reports will be prepared and distributed by the QAO. A brief description of each record is described below.

5.4.1 Data Usability Summary Reports

The DUSR will be prepared as required by NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 2B, May, 2010. The DUSR will summarize the impacts of using data that do not achieve overall data quality objectives or that do not meet PARCCS criteria identified in Section 2.3. Additionally, the report will be used to identify, assess and present issues associated with the overall data.

5.4.2 Audit Reports

Among other QA audit reports, which may be generated during the conduct of activities, a final audit report for this project may be prepared by the QAO. The report will include:

- Periodic assessment of measurement data accuracy, precision, and completeness
- Results of performance audits and/or system audits
- Significant QA problems and recommended solutions for future projects
- Status of solutions to any problems previously identified

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TABLE 5.1
SUMMARY OF FIELD, LABORATORY, AND DATA MANAGEMENT RECORDS

REPORT	PERSON RESPONSIBLE FOR		STORAGE
	MAINTENANCE	DISTRIBUTION	
PROJECT FILES AND FIELD SAMPLING RECORDS			
Field Logbook	Field Team Leader	Project Manager	Job File at Primary RC's Location
Photographs	Field Team Leader	Project Manager	Job File at Primary RC's Location
Chain-of-Custody	Field Team Leader	Project Manager	Job File at Primary RC's Location
Field Sampling Records	Field Team Leader	Project Manager	Job File at Primary RC's Location
LABORATORY RECORDS			
Reagent and Titrant Preparation Records	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Standards Preparation Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Sample Preparation Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Bench Data Sheets	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Instrument Run Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory

TABLE 5.1
SUMMARY OF FIELD, LABORATORY, AND DATA MANAGEMENT RECORDS (CONT.)

REPORT	PERSON RESPONSIBLE FOR		STORAGE
	MAINTENANCE	DISTRIBUTION	
Strip Chart Recordings/ Chromatograms/Computer Output	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Analytical Data Reports	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Log-in Sheets	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Maintenance Records	Quality Assurance Manager	Laboratory Project Manager	Instrument Maintenance Logbook at Laboratory
Periodic Calibration Records	Quality Assurance Manager	Laboratory Project Manager	QA Files at Laboratory
Operational Calibration Records	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Nonconformance Memos	Quality Assurance Manager	Laboratory Project Manager	Maintained in Datbase File at Laboratory
Corrective Action Request Forms	Quality Assurance Manager	Laboratory Project Manager	Client Correspondence Records at Laboratory
DATA VALIDATION AND AUDIT RECORDS			
Data Validation Reports	Quality Assurance Officer	Quality Assurance Officer	Job File at Primary RC's Location
Audit Reports	Quality Assurance Officer	Quality Assurance Officer	Job File at Primary RC's Location

SECTION 6

ANALYTICAL PROCEDURES

6.1 INTRODUCTION

To meet program specific regulatory requirements for chemicals of concern, all methods will be followed as stated, with some specific requirements noted below. Chemical analyses for inorganics, organics, and wet chemistry parameters will be conducted in accordance with the QAPP, the Work Assignment Scoping Documents, NYSDEC ASP, laboratory's SOPs (maintained "on-file" at the laboratory), and with referenced analytical methods including USEPA SW846, 3rd edition Test Methods for Evaluating Solid Waste, Physical, and Chemical (USEPA, 2009), and Methods for Chemical Analysis of Water and Wastes (USEPA, 1983). Where requirements conflict, the technical and QA/QC requirements in this AQAPP or the work plan take precedence.

6.2 STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOPs) are a written step-by-step description of laboratory operating procedures exclusive of analytical methods. Laboratories providing analytical support for this project will be required to document all procedures in SOPs. The SOPs must address the following areas:

- Storage containers and sample preservatives
- Sample receipt and logging
- Sample custody
- Sample handling procedures
- Sample transportation
- Glassware cleaning
- Laboratory security
- QC procedures and criteria
- Equipment calibration and maintenance
- Documentation
- Safety
- Data handling procedures
- Document control
- Personnel training and documentation
- Sample and extract storage
- Preventing sample contamination
- Traceability of standards
- Data reduction and validation
- Maintaining instrument records and logbooks

- Nonconformance
- Corrective actions
- Records management

SECTION 7

DATA VALIDATION AND USABILITY ELEMENTS

7.1 DATA REVIEW, VERIFICATION, AND VALIDATION

The data collected during this project will undergo a systematic review for compliance with the DQOs and performance objectives as stated in Section 2. In particular, field, laboratory, and data management activities will be reviewed to confirm compliance with the method QC criteria for performance and accuracy and to show that data were collected in a manner that is appropriate for accomplishing the project objectives. These data will be evaluated as to their usability during data verification. In particular, data outside QC criteria, but not rejected, will be reviewed for possible high and low bias. All data will be validated following verification and reduction.

Qualified data validation personnel will assess and verify data; they will review the data against QC criteria, DQOs (Sections 2 and 7.2.2), NYSDEC ASP, and USEPA Region 2 SOPs for data review to identify outliers or errors and to flag suspect values. Category B deliverables will be required for all PCB confirmatory testing. Field and laboratory activities that should be reviewed include, at a minimum, sample collection, handling, and processing techniques; field documentation records; verification of proper analytical methods; analytical results of QC samples; and calibration records for laboratory instruments and field equipment. A review of such elements is necessary to demonstrate whether the DQOs outlined in Section 2 were met. Samples that deviate from the experimental design and affect the project objectives must be reported to the QAO and data validation personnel.

Departures from standard procedures (in the CFSP, this AQAPP, or the laboratory SOPs, may lead to exclusion of that data from the project database or validation process, based on discussions with and approval of the NYSDEC. However, routine field audits involving thorough reviews of sample collection procedures and sample documentation should preclude such deviations from occurring. Additionally, routine laboratory audits will be used to document proper sample receipt, storage, and analysis; instrument calibration; use of the proper analytical methods; and use of QC samples to assist in appropriately qualifying the data.

The laboratory's analytical report for each sample delivery group (SDG) will be assembled by collecting and incorporating all the data for each analysis associated with the reported samples; the analytical narratives; and other report-related information such as copies of chain-of-custody forms, communication records, and nonconformance forms.

Before the laboratory submits data, the laboratory's data review process will include a full first level "technical" review by the laboratory's analyst during sample analysis and data generation. The review must include a check of all QC data for errors in transcription, calculations, and dilution factors and for compliance with QC requirements. Failure to meet method performance QC criteria may result in the reanalysis of the sample or analytical batch. After the initial review is completed, the data will be collected from summary sheets, workbooks, or computer files and assembled into a data package.

The laboratory's first review will be followed by a second-level technical review of the data package. The second level review may be performed by a peer trained in the procedures being reviewed or by the appropriate analytical group supervisor. The reviewer will check the data packages for completeness and compliancy with the project requirements and will certify that the report meets the DQOs for PARCCS specifications. The report narrative will be generated at this stage of the data review. Any problems discovered during the review and the corrective actions necessary to resolve them will be communicated to the responsible individual, who will discuss the findings with the laboratory QA manager for resolution.

The first and second review will be conducted throughout sample analysis and data generation to validate data integrity during collection and reporting of analytical data. Data review checklists will be used to document the performance and review of the QC and analytical data.

Before the laboratory's final release to the client, the data will undergo a final review by the laboratory's QA officer or his/her designee. This third level review is to confirm that the report is complete and meets project requirements for performance and documentation. The laboratory's QA officer must review reports involving non-conforming data issues. A summary of all non-conformances will be included in the case narrative. The report will then be released to the client for data validation, and a copy will be archived by the laboratory for a period of 7 yrs.

The laboratory analytical data will be validated using project-specific data validation procedures to confirm that data meet the applicable data quality objectives. Depending on the type of data and the intended data uses, the data validation process for a given SDG (or a specific percentage of sample analyses) or analytical method may be performed following an EPA Level IV protocol (full validation), or an EPA Level III protocol (sample plus QC summary data only, no raw data review). The project-specific Level III data validation protocol will provide a level of review resulting in the generation of a data usability summary report (DUSR), as defined by NYSDEC. Level III validation will be performed on all DQO Level III and all DQO Level IV data. Ten percent (10%) of the DQO Level IV Data for each analytical method will undergo a Level IV validation. Certain geotechnical and field screening data may be evaluated in a manner suitable for the intended data uses.

A data validation report will be issued and reviewed by the QAO before finalization. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of PARCCS criteria for each analytical method. The validation criteria are objective and are not sample dependent, except for consideration of sample matrix effects. The criteria specify performance requirements that should be under the control of the field-sampling contractor or analytical laboratory. This AQAPP will be the primary reference for evaluating the data.

After data validation, the data will be evaluated for consistency with site conditions and developed conceptual models. Data validation personnel will prepare a project DUSR that summarizes the implications of the use of any data out of criteria. In addition, the data usability report will include the percentage of sample completeness for critical and non-critical samples and a discussion of any issues in representativeness of the data that may develop as a result of

validation. The data usability report will address overall data quality and achievement of PARCCS criteria and assess issues associated with the overall data and data quality for all validated Level III and Level IV data.

7.2 VERIFICATION AND VALIDATION METHODS

7.2.1 Laboratory

The laboratory will verify and assess analytical data against the stated requirements on the chain-of-custody record, the sample handling procedures (Section 3), and the QC parameters. The laboratory data reviewers will also check that transcriptions of raw or final data and calculations were performed correctly and are verified.

Following data verification, analytical data generated by the laboratory will be reduced and managed based on the procedures specified in this AQAPP and analytical methodologies. Data reduction includes all processes that change either the values or numbers of data items. The data reduction processes used in the laboratory includes establishment of calibration curves, calculation of sample concentrations from instrument responses, and computation of QC parameters.

The reduction of instrument responses to sample concentrations takes different forms for different types of methods. For most analyses, the sample concentrations are calculated from the measured instrument responses using a calibration curve. The sample concentrations can be back-calculated from a regression equation fitted to calibration data. For gravimetric and titrimetric analyses, the calculations are performed according to equations given in the method. For chromatographic analyses, the unknown concentrations are determined using either calibration factors (external standard procedure) or relative response factors (internal standard procedure). GC analyses are generally quantitated using the external standard technique; GC/MS analyses are quantitated using the internal standard technique. These calculations are generally performed by the associated computerized data systems.

Validated analytical data will be loaded into a database and reported in tabular format. Database fields will include the field sample identification, laboratory sample identification, blinded sample number, analytical results, detection limits, and validation qualifiers. The usability of the data will be evaluated by the QAO or designee.

7.2.2 Analytical Data Validation

The data review process is performed in two phases:

1. **Initial phase, contract compliance screening (CCS)**: Review of sample data deliverables for completeness. Completeness is evaluated by ensuring that all required data deliverables are received in a legible format with all required information. The CCS process also includes a review of the chain-of-custody forms, case narratives, and RLs. Sample resubmission requests, documentation of nonconformances with respect to data deliverable completeness, and corrective actions often are initiated during the CCS review. The results of the CCS process are incorporated into the data validation process.
2. **Second phase, data validation:** A project-specific data validation procedure based on a “Level III” or the “Level IV” validation protocol will be performed on the analytical

results from the fixed-base laboratory or laboratories, with the exception of the bench-scale testing data. The EPA Level III validation protocol includes a review of summary information to determine adherence to analytical holding times, results from analysis of field duplicates, method blanks, field blanks, surrogate spikes, MS/MSDs, LCSs (or MSBs), sample temperatures during shipping and storage, initial and continuing calibration forms, internal standard area count forms, and any other QC forms. Data qualifiers are applied to analytical results during the data validation process based on adherence to method protocols and laboratory-specific QA/QC limits. The EPA Level IV validation protocol incorporates the Level III validation protocol and adds calculation checks from the raw data of reported and summarized sample data and QC results.

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FULL VALIDATION (USEPA LEVEL IV EQUIVALENT)	
Organic Analytical Methods	**Inorganic Constituents, Wet Chemistry Parameters**
Percentage of solids	Percentage of solids
Sample preservation and holding times	Sample preservation and holding times
Instrument tuning	Calibrations
Instrument calibrations	Blank results
Blank results	Interference check samples (inorganics only)
System monitoring compounds or surrogate recovery compounds (as applicable)	LCSs
Internal standard recovery results	Project Required Reporting Limit (PRRL) standard check samples
MS and MSD (or MD) results	Duplicates
LCS (or MSB) results	MSs (pre-digestions and post-digestions for inorganics only)
Target compound identification	ICP serial dilutions and
Chromatogram quality	Results verification and reported detection limits
Duplicate results	
Compound quantitation and reported RLs	
System performance and	
Results verification	

The laboratory will send the required analytical data package deliverables, consisting of CD-ROM and hardcopy versions and the EDD, following completion of the laboratory's validation process (Section 7.2.2). Data validation will be performed in accordance with the USEPA **Region 2 Data Validation SOPs** for organic and inorganic data review (USEPA, 2012a, 2012b, 2012c, 2013c, 2013d, 2013e, 2013f). In addition, Parsons will refer to this AQAPP and the work plan to verify that DQOs were met. If problems are identified during data validation, the QAO and the laboratory QA manager will be alerted, and corrective actions will be requested. The LPM and data validation chemists will maintain close contact with the QAO to ensure all nonconformance issues are acted upon prior to data manipulation and assessment routines.

Data validation will be conducted using the USEPA guidelines (USEPA, 2008, 2010, 2013a, 2013b, 2013g, 2013h) as supplementary guidelines. Where CLP guidelines and SW-846 disagree, this AQAPP and data validation professional judgment will prevail.

Trained and experienced data validation chemists will perform the data validation work. The QAO will review the data validation report before it is finalized. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of PARCCS criteria for each analytical method. A detailed assessment of each SDG will follow. Based on the results of data validation, the validated analytical results reported will be assigned a usability flag (see chart below).

USABILITY FLAGS FOR VALIDATED RESULTS	
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ	Analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
C	This qualifier applies to GC results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS)
X	This qualifier applies to results when GC/MS analysis was attempted by unsuccessful.
No flag	Result accepted without qualification

7.3 RECONCILIATION WITH USER REQUIREMENTS

Following data validation by qualified personnel, the data will be evaluated by the QAO and the project manager as to consistency with site conditions and developed conceptual models to determine whether field and analytical data meet the requirements for decision making. Specifically, the results of the measurements will be compared to the DQOs (Section 2).

SECTION 8

ASSESSMENT AND OVERSIGHT

8.1 ASSESSMENTS AND RESPONSE ACTIONS

Performance and system audits of both field and laboratory activities may be performed. Any such audits will be performed at a frequency to be determined to ensure that sampling and analysis activities are completed in accordance with the procedures specified in the CFSP and this AQAPP.

Quality assurance audits will be carried out under the direction of the QAO on field activities, including sampling and field measurements. They will be implemented to verify that established procedures are being followed and to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s).

The QAO will plan, schedule, and approve system and performance audits based on procedures customized to the project requirements. If required, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. Quality auditing personnel will not have responsibility for field or laboratory project work.

8.2 PROJECT-SPECIFIC AUDITS

Project-specific audits include system and performance audits of sampling and analysis procedures, and of associated recordkeeping and data management procedures. Project-specific audits will be performed on a discretionary basis at a frequency determined by the project manager.

8.2.1 System Audits

The QAO may perform system audits. Such audits will encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory QC procedures and associated documentation may be system-audited including the field logbook, field sampling records, laboratory analytical records, sample handling, processing, and packaging in compliance with the established procedures, maintenance of QA procedures, and chain-of-custody procedures. These audits may be carried out during execution of the project to confirm that sampling crews employ consistent procedures. However, if conditions adverse to quality are detected additional audits may occur.

Findings from the audit will be summarized and provided to the PM and/or designated personnel so that necessary corrective action can be monitored from initiation to closure.

8.2.2 Performance Audits

The laboratory may be required to conduct an analysis of PE samples or provide proof that PE samples were submitted by an approved USEPA or NYSDEC performance testing provider within the past 12 months. If necessary, proof that applicable PE samples have been analyzed at the laboratory within the past 12 months will be included in the laboratory procurement package.

8.2.3 Formal Audits

Formal audits are any system or performance audit that the QAO documents and implements. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklist to verify objectively that QA requirements have been developed, documented, and instituted in accordance with contractual and project criteria. At the discretion of the project manager, the QAO or designated personnel may conduct formal audits on project and subcontractor work during the course of the project.

Auditors who have performed the site audit after gathering and evaluating all data will write audit reports. Items, activities, and documents determined by lead auditors to be in noncompliance must be identified at exit interviews conducted with the involved management. Noncompliance will be logged and documented through audit findings. These findings will be attached to and become part of the integral audit report. These audit-finding forms are directed to management to resolve satisfactorily the noncompliance in a specified and timely manner.

The QAO has overall responsibility to see that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports will be submitted to the PM after completion of the audit. Serious deficiencies will be reported to the PM on an expedited basis. Audit checklists, audit reports, audit findings, and acceptable resolutions will be approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

8.2.4 Laboratory Audits

Internal laboratory audits will be performed routinely to review and evaluate the adequacy and effectiveness of the laboratory's performance and QA program, to ascertain if the QAPP is being completely and uniformly implemented, to identify nonconformances, and to verify that identified deficiencies are corrected. The laboratory QA manager is responsible for such audits and will perform them according to a schedule planned to coincide with appropriate activities on the project schedule and sampling plans. Such scheduled audits may be supplemented by additional audits for one or more of the following reasons:

- When significant changes are made in the QAPP
- When necessary to verify that corrective action has been taken on a nonconformance reported in a previous audit
- When requested by the laboratory's project manager or QA manager.

8.2.4.1 Laboratory Performance Audits

Performance audits are independent sample checks made by a supervisor or auditor to arrive at a quantitative measure of the quality of the data produced by one section or the entire measurement process. Performance audits are conducted by introducing control samples, in addition to those used routinely, into the data production process. These control samples include PE samples of known concentrations. The results of performance audits will be evaluated against acceptance criteria. The results will be summarized and maintained by the laboratory QA manager and distributed to the supervisors who must investigate and respond to any results that are outside control limits.

8.2.4.2 Laboratory Internal Audits

The laboratory QA manager conducts routine internal audits of each laboratory section for completeness, accuracy, and adherence to SOPs. The laboratory audit team will verify that the laboratory's measurement systems are operated within specified acceptable control criteria and that a system is in place to confirm that out-of-control conditions are efficiently identified and corrected.

8.2.4.3 Laboratory Data Audits

The laboratory will maintain raw instrument data for sample analyses on magnetic tape media or optical media in a secured fireproof safe. During routine audits, the audit team will verify the processing of the raw data file by reviewing randomly selected electronic data files and comparing the results with the hardcopy report. Tapes will be archived for a period of 7 yr. Tapes will be also available for audit by the QAO upon request.

8.2.4.4 Laboratory Audit Procedures

Prior to an audit, the designated lead auditor will prepare an audit checklist. During an audit and upon its completion, the auditor will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. The auditor will prepare and submit an audit report to the designated responsible individual of the audited group, the PM, and the QAO. Minor administrative findings that can be resolved to the satisfaction of the auditor during an audit need not be cited as items requiring corrective action. Findings that are not resolved during the course of the audit and findings affecting the overall quality of the project will be included in the audit report.

The designated responsible individual of the audited group will prepare and submit to the QAO a reply to the audit. This reply will include, at a minimum, a plan for implementing the corrective action to be taken on nonconformances indicated in the audit report, the date by which such corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation should be attached to the reply. The auditor will ascertain (by re-audit or other means) if appropriate and timely corrective action has been implemented.

Records of audits will be maintained in the project files. Audit files will include, as a minimum, the audit report, the reply to the audit, and any supporting documents. It is the responsibility of the designated responsible individual of the audited group to conform to the established procedures, particularly as to development and implementation of such corrective action.

8.2.4.5 Laboratory Documentation

To confirm that the previously defined scope of the individual audits is accomplished and that the audits follow established procedures, a checklist will be completed during each audit. The checklist will detail the activities to be executed and ensure that the auditing plan is accurate. Audit checklists will be prepared in advance and will be available for review.

AUDIT CHECKLIST (AT MINIMUM)
Date and type of audit
Name and title of auditor
Description of group, task, or facility being audited
Names of lead technical personnel present at audit
Checklist of audit items according to scope of audit
Deficiencies or non-conformances

Following each system, performance, and data audit, the QAO or his designee will prepare a report to document the findings of the specific audit. The report will be submitted to the designated individual of the audited group to ensure that objectives of the QA program are met.

MINIMUM CONTENT OF AUDIT REPORT
Description and date of audit
Name of auditor
Copies of completed, signed, and dated audit form and/or checklist
Summary of findings including any nonconformance or deficiencies
Date of report and appropriate signatures
Description of corrective actions

The QAO will maintain a copy of the signed and dated report for each audit. If necessary, a second copy will be placed in project files.

8.3 CORRECTIVE ACTIONS

Corrective action procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected. Corrective action enables significant conditions adverse to quality to be noted promptly at the site, laboratory, or subcontractor location. Additionally, it allows for the cause of the condition to be identified and corrective action to be taken to rectify the problem and to minimize the effect on the data set. Further, corrective action is intended to minimize the possibility of repetition.

Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, PM, FTL, and involved subcontractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action. Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The designated responsible individual of the audited group will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

Events that trigger corrective actions
When predetermined acceptance standards are not attained
When a deviation from SOP is required or observed
When procedure or data compiled are determined to be deficient
When equipment or instrumentation is found to be faulty
When samples and analytical test results are not clearly traceable
When QA requirements have been violated
When designated approvals have been circumvented
As a result of system and performance audits
As a result of a management assessment
As a result of laboratory/field comparison studies
As required by analytical method

All project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Specifically, the laboratory must designate the assigned individual to act as the primary laboratory contact responsible for timely identification and resolution of any and all issues including contract and administrative issues. Any phone calls initiated by personnel or designated representatives to the laboratory with respect to corrective actions must be returned in a timely manner on a normal business day if the designate individual (or alternate) is not available at the initiation of the phone call.

Project management and related staff, including field investigation teams, remedial design planning personnel, and laboratory groups will monitor on-going work performance as part of daily responsibilities. Work may be audited at the site, the laboratories, or subcontractor locations. Activities or documents ascertained to be noncompliant with QA requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the QAO, PM, or designated personnel.

Personnel assigned to QA functions will have the responsibility to issue and control CAR forms (Figure 8.1). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered.

Similar to the CAR, the laboratory will record and report nonconformances internally using the laboratory's nonconformance documentation tracking system in the form of an NCM. Each NCM is traceable so that it can be cross-referenced with its resolution to the associated project records. The laboratory QA manager summarizes critical nonconformances, such as reissued reports and client complaints, in a monthly report to the laboratory management staff. Management of the NCM is described in Section 5.3. Corrective action procedures applicable to QC requirements that do not meet the criteria of this QAPP are described in the following sections. Consistent, frequent contacts between laboratory personnel, the QAO, or designated personnel are required.

TYPICAL CONTENT OF NCM FORMS
Problem description and root cause
Corrective action
Client notification summary
QA verification
Approval history action

☐ **FIGURE 8.1**

CORRECTIVE ACTION REQUEST FORM

CORRECTIVE ACTION REQUEST

Number _____ Date:_____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you (a) to resolve the noted conditions and (b) to prevent it from recurring. Your written response is to be returned to the Project quality assurance manager by _____.

Condition:

Reference Documents:

_____	_____	_____	_____	_____	_____
Originator	Date	Approval	Date	Approval	Date

Response

Cause of Condition:

Corrective Action

Resolution:

(B) Prevention

(B2) Affected Documents

Signature_____ Date_____

CA Follow-up

Corrective Action verified by:_____ Date _____

SECTION 9

QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS

9.1 INTRODUCTION

Quality assurance audits may be performed by or under the direction of the project QAO. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to Parsons corporate quality assurance management, the QAO may plan, schedule, and approve system and performance audits based upon Parsons' procedure customized to the project requirements. At times, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

9.2 SYSTEM AUDITS

System audits, performed by the QAO or designated auditors, will encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests, additional audits may occur.

9.3 PERFORMANCE AUDITS

The laboratory will be required to conduct an analysis of Performance Evaluation (PE) samples or provide proof that Performance Evaluation samples submitted by USEPA or a state agency have been analyzed within the past twelve (12) months.

9.4 FORMAL AUDITS

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Noncompliances will be logged and documented through audit findings which are attached to and are a part of the integral audit report. These audit finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

SECTION 10

PREVENTIVE MAINTENANCE PROCEDURES AND SCHEDULES

10.1 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 procedure developed by the operators.

A list of critical spare parts will be established by the operator. These spare parts will be available for use in order to reduce the downtime. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

10.2 SCHEDULES

Written procedures will establish the schedule for servicing critical items in order to minimize the downtime of the measurement system. The laboratory will adhere to the maintenance schedule, and arrange any necessary and prompt service. Required service will be performed by qualified personnel.

10.3 RECORDS

Logs shall be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories. The QAO may audit these records to verify complete adherence to these procedures.

SECTION 11

PROCEDURES FOR ASSESSING DATA

11.1 INTRODUCTION

The data collected during this project will undergo a systematic review for compliance with the DQOs and performance objectives as stated in Section 2. In particular, laboratory and field data will be reviewed for compliance with the method QC criteria for performance and accuracy. As noted in Section 7, the chemical data will be qualified according to USEPA Region II SOPs and reported. These data will be evaluated as to usability. In particular, data outside QC criteria, but not rejected, will be reviewed for the magnitude of possible positive and negative bias.

A data usability report which summarizes the implications of the use of any data out of criteria will be written for each round of data. In addition, the data usability report will include the percentage of sample completeness for critical and noncritical samples and a discussion of any issues in representativeness of the data that may develop as a result of validation. The data usability report will address overall data quality and achievement of PARCCS and assess issues associated with the overall data.

After data validation, the data will be evaluated as to consistency with site conditions and developed conceptual models.

SECTION 12

REPORTS TO MANAGEMENT

12.1 INTRODUCTION

Parsons management personnel receive QA reports appropriate to their level of responsibility. The PM receives copies of all QA documentation. QC documentation is retained within the department, which generated the product or service except where this documentation is a deliverable for a specific contract. QC documentation is also submitted to the QAO for review and approval. Previous sections detailed the QA activities and the reports, which they generate. A final audit report for each project may also be prepared. The reports may include:

- Periodic assessment of measurement data accuracy, precision, and completeness;
- Results of performance audits and/or system audits;
- Significant QA problems and recommended solutions for future projects; and
- Status of solutions to any problems previously identified.

Additionally, any incidents requiring corrective action will be fully documented.

SECTION 13

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