ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

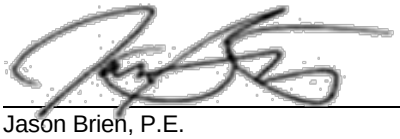
Consolidated Edison Company of New York, Inc.

Interim Remedial Measure Work Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

September 2014

ARCADIS



Jason Brien, P.E.
Engineer of Record

Meredith Hayes
Project Manager

Interim Remedial Measure Work Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Manufactured Gas Plant
Bronx, New York

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse,
New York 13214-0066
Tel 315 446 9120
Fax 315 449 0017

Our Ref.:
B0043027.0005.00020

Date:
September 2014

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

ARCADIS

Certification

I, Jason D. Brien, P.E., certify that I am a New York State registered professional engineer and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the Division of Environmental Remediation Technical Guidance for Site investigation and Remediation (DER-10).

9/15/14

Jason D. Brien, P.E.
NYS P.E. License No. 084067

Interim Remedial Measure Work Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Manufactured Gas Plant
Bronx, New York

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse,
New York 13214-0066
Tel 315 446 9120
Fax 315 449 0017

Our Ref.:
B0043027.0005.00020

Date:
September 2014

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

ARCADIS

Table of Contents

Figures

Appendices

Acronyms and Abbreviations

ASTM	American Society for Testing and Materials
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
CLSM	controlled low-strength material
CSMP	Construction Site Management Plan
Con Edison	Consolidated Ediston Company of New York, Inc.
HASP	Health and Safety Plan
HDPE	high-density polyethylene
IRM	interim remedial measure
IRMWP	Interim Remedial Measure Work Plan
MGP	manufactured gas plant
MPR	monthly progress report
NYC EDC	New York City Economic Development Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	operable unit
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PDI WP	Pre-Design Investigation Work Plan
RAO	remedial action objective
site	Hunts Point former manufactured gas plant site
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TCL	Target Compound List
VOC	volatile organic compound

1. Introduction and Purpose

This Interim Remedial Measure Work Plan (IRMWP) presents a design for a storm sewer replacement on the Krasdale Foods, Inc. leasehold portion (Krasdale property) of the Hunts Point former manufactured gas plant (MGP) site (site). The storm sewer replacement is being conducted to prevent discharge of MGP-impacted water from the storm sewer to the Bronx River.

This IRMWP presents the construction elements to implement the storm sewer replacement. The text, attached design drawings, specifications, and supporting documents are collectively referred to as the Contract Documents.

1.1 Site Description

1.1.1 Site History

Consolidated Edison Company of New York, Inc. (Con Edison) operated the Hunts Point former MGP from late 1926 to 1962. Demolition of the former MGP was completed in early 1968. That same year, Con Edison sold the majority of the 205-acre site to the City of New York (i.e., New York City Economic Development Corporation [NYC EDC]) for use as a wholesale cooperative food market. Portions of the former MGP have been divided into parcels (A through F) for purposes of investigation and remediation (to be completed by others).

Various investigations and remedial actions completed at the Hunt's Point former MGP site to date have documented petroleum and MGP-related residuals—including coal tars, oils, and purifier wastes—as well as constituents associated with these residuals. Benzene, toluene, ethylbenzene, and xylenes compounds; polycyclic aromatic hydrocarbons (PAHs); and inorganic constituents, such as cyanides, have been identified as the primary constituents of concern on the former MGP property. A detailed summary of previous investigations and remedial actions completed at the site is included in the Site Characterization Report (ARCADIS 2013).

For technical and administrative reasons, the New York State Department of Environmental Conservation (NYSDEC) divided the portions of the Hunt's Point former MGP site (Voluntary Cleanup Program Site No. V00554) for which Con Edison was responsible for the investigation and remediation into the following operable units (OUs):

- OU-1 – Krasdale Property
- OU-3 – Halleck Street
- OU-4 – National Foods Parcel
- OU-5 – Sediments
- OU-6 – Marine Transfer Station

Based on completed inspections, a storm sewer located along the northern boundary of the Krasdale property (OU-1) shows significant erosion of the concrete material and separation at the pipe joints. This storm sewer serves as a potential migration pathway for impacted groundwater located near the northern portion of the Krasdale property. This document presents a work plan for implementing an interim remedial measure (IRM) to address this storm sewer.

1.1.2 Location

The Krasdale property is located on the northeastern portion of the Hunts Point former MGP in the Borough of Bronx, New York City, Bronx County, New York (Figure 1). The Krasdale leasehold property is an approximately 11-acre tract of land on the eastern portion of Hunts Point, a peninsula at the confluence of the Bronx and East Rivers. The Krasdale property is bounded by Food Center Drive to the west, Parcel D to the north, Parcel C to the south, and the Bronx River to the east, and includes Parcel F. As indicated above, the referred-to parcels were designated as part of the larger planned investigation and remediation of the Hunt's Point former MGP.

1.1.3 Site Features

The Krasdale property is covered by impervious surfaces (generally asphalt and warehouse buildings). Based on survey information provided by NYC EDC, topography in the area of the subject storm sewer is relatively flat (less than 1%), and slopes east, towards the Bronx River. The site is surrounded by a chain-link fence and receives relatively heavy tractor trailer traffic throughout the day.

As shown on Design Drawing 2 – Existing Conditions (Appendix B), the subject storm sewer is located along the northern end of the asphalt parking lot and discharges to outfall OF-1. Associated catch basins are bordered to the north by a stone curb and the eastern two-thirds of the storm sewer is bordered to the north by an approximately 6-foot-wide asphalt walkway.

1.1.4 Current Zoning and Land Use

The Krasdale property is currently zoned as manufacturing (M3-1). M3 zoning districts are designated for areas with heavy industries that generate noise, traffic, or pollutants. Typical uses include power plants, solid waste transfer facilities and recycling plants, and fuel supply depots (New York City Department of City Planning 2013 – NYC.gov).

The Krasdale property is currently used as a warehouse facility for shipping and receiving of food products.

1.1.5 Site Geology and Hydrology

The subsurface lithology near the storm sewer pipe is depicted on the cross-section presented on Figure 2 (cross-section location shown on Figure 1). As indicated on the cross-section, the geology underlying the storm sewer is composed of five distinct units: two fill units, a silt-clay unit, a deeper sand unit, and bedrock. The shallowest units are the fill units. The first fill unit lies within the western portion of area where the subject storm sewer is located. This fill is composed of sand, gravel, cobbles, purifier wastes (wood chips and wood pulp), and other debris, such as brick, ash, coal, slag, fabric/geotextile, and wood. The second fill unit is located adjacent to the river within the area that was filled in between 1947 and 1975 and is composed of fine to medium sands and silty sands with occasional coarser sands and gravels. This fill unit does not contain significant debris or purifier waste. Both fill units are underlain by a silt-clay unit described as a silty clay to clay with occasional fine sand lenses and peat. The silt-clay unit is considered to be a confining layer at the site. Below the silt-clay unit is a sand unit composed of silty fine to medium sand and weathered bedrock. A layer of schist bedrock serves as the lowermost unit for the site.

The water table generally occurs in the shallow subsurface at depths ranging from approximately 2 to 10 feet below ground surface. In general, groundwater flow is directed from west to east toward the Bronx River. However, groundwater flow may be influenced by tidal conditions within the adjacent river and the numerous subsurface utilities in the area.

As shown on Design Drawing 2 (Appendix B), the storm sewer and its associated drainage area are located north of the warehouse buildings on the Krasdale property. Precipitation that falls within the storm sewer drainage area is generally conveyed via overland flow to catch basins (designated as Inlets 111, 112, 113, and 120). The storm

sewer subsequently conveys stormwater flow to the Bronx River where it is discharged at outfall OF-1.

Precipitation that falls on the warehouse and remaining parking areas is collected and conveyed independently of the subject storm sewer and is not part of this evaluation.

2. Document Organization

Con Edison has the ultimate responsibility for implementing the storm sewer replacement, including operating a community air monitoring program. Con Edison has retained ARCADIS to provide remedial design and engineering support during the storm sewer replacement construction. Con Edison and New York State regulatory agencies will participate jointly in the storm sewer replacement for the site. Approval of the Pre-Design Investigation Work Plan (PDI WP) by the NYSDEC and NYC EDC was obtained prior to developing this IRMWP. Appendix A provides the NYSDEC's approval letter. Con Edison will be responsible for all on-site construction operations during the project unless otherwise stated in Section 3.

Communication with regulatory agencies and with members of the surrounding community will be managed by Con Edison. Con Edison will notify the NYSDEC, the NYC EDC, and Krasdale Foods prior to the start of storm sewer replacement activities at the site.

The remainder of this IRMWP is organized as follows:

- Section 3: Basis of Design – Presents pertinent design information for the various construction elements.
- Section 4: Pre-Construction Activities – Presents the activities to be performed before construction takes place.
- Section 5: Construction Activities – Presents the construction components required to perform the storm sewer replacement.
- Section 6: Schedule – Provides a preliminary project schedule for NYSDEC review of the Contract Documents and contractor procurement activities.
- Section 7: Reporting and Documentation of Site Activities – Summarizes the documentation of the construction activities, as well as the record drawings that will be developed following completion of the storm sewer replacement.
- Section 8: References – Presents the literature cited within this IRMWP.
- Appendix A: NYSDEC's Approval Letter – Letter approval by the NYSDEC to prepare the IRMWP as outlined in the PDI WP.

- Appendix B: Design Drawings – Present the engineering design and specifications that will serve as the basis for construction activities.

- Appendix C: Specifications – Provides technical specifications for performing the construction activities.

- Appendix D: Stormwater Pollution Prevention Plan – Presents the erosion and sedimentation control measures to be implemented during the storm sewer replacement.

- Appendix E: Community Air Monitoring Plan – Provides the air monitoring requirements to be implemented during the storm sewer replacement.

- Appendix F: Waste Management Plan – Provides the required waste stream processes to follow for all materials destined for off-site disposal.

- Appendix G: 2013 Pre-Design Investigation Design Report – Provides supplemental information to support implementation of the storm sewer replacement.

- Appendix H: Construction Site Management Plan – Specifies the engineering controls and best management practices to be followed during the storm sewer replacement activities.

- Appendix I: Construction Quality Assurance Plan – Provides quality assurance protocols to implement during the construction to confirm that the storm sewer replacement is performed in accordance with this IRMWP.

3. Basis of Design

3.1 Storm Sewer Pipe Replacement Objective

The objective of the pipe replacement is to provide a water-tight (i.e., zero leakage) storm sewer system across the site.

3.2 Summary of Storm Sewer Replacement

In general, the storm sewer replacement will consist of the following:

- Excavation of soil and subsurface structures to facilitate pipe installation
- Installation of new high-density polyethylene (HDPE) storm sewer pipe and manholes
- Off-site treatment/disposal of the excavated materials
- Off-site treatment and disalbrightposal of all potentially impacted water (e.g., groundwater, stormwater that enters the excavation area, decontamination water) generated during the storm sewer replacement
- Backfilling the trenched excavation area
- Site restoration

The work will include all activities required of the Contractor to plan, organize, monitor, and coordinate the logical and timely sequence of activities, in accordance with applicable regulatory requirements.

3.3 Basis of Design

3.3.1 Storm Sewer System Materials

The storm sewer replacement requires four new HDPE manholes, consistent with the existing configuration. HDPE manholes were selected to provide the leak-tight joints required to meet the project objective and to provide a pipe material compatible with surrounding soil and groundwater.

The pipe joints were selected to be butt fusion welded, where possible, which would meet the objective of providing a zero-leakage pipe. The HDPE manhole to pipe connections and any other joints that cannot be butt fused will be flange connections per the design specifications.

3.3.2 Fill Material

Controlled low-strength material (CLSM) was selected as the primary fill material bedding and surrounding the new storm sewer pipe. CLSM was selected to provide a solid, non-porous layer that will limit the migration of contaminated groundwater along the pipe. A CLSM mix design was developed based on compatibility with site groundwater and pipe design life. The CLSM mix was designed to account for exposure to a low pH (i.e., 1.5) environment, while maintaining integrity equivalent to the 50-year design life of the replacement storm sewer system.

3.3.3 Hydraulic Evaluation

New storm sewer system piping and catch basins were sized and sloped consistent with the pre-existing system. Based on the associated roughness coefficients of the pre-existing and proposed pipe materials, the new storm sewer system will provide a greater flow capacity than the previous system.

4. Interim Remedial Measure Evaluation

This section presents an overall evaluation of storm sewer IRM activities (as generally described in Section 3 and presented in detail in Section 5) relative to the criteria presented in 6NYCRR Part 375-1.8(f). The remedial action objectives (RAOs) for the storm sewer IRM are presented below followed by the detailed evaluation of the IRM.

4.1 Remedial Action Objectives

As indicated in the in June 2011 (Revised August 2011) Dry Weather Discharge Evaluation Work Plan (Evaluation Work Plan) (ARCADIS, 2011), Section 1.2, NYSDEC identified the following remedial action objectives (RAOs) for the storm sewer replacement activities in a July 12, 2011 letter to Con Edison:

- Preventing the continuing discharge of contaminants to surface water (i.e., the Bronx River).
- Removing the source of groundwater or surface contamination, to the extent feasible.
- Preventing migration of contaminants that would result in groundwater or surface contamination.

4.2 Storm Sewer IRM Evaluation

An evaluation of the storm sewer IRM with respect to the NYSDEC evaluation criteria is presented below.

4.2.1 Short-Term Impacts and Effectiveness

The short-term impacts and effectiveness criterion is used to evaluate the IRM relative to the potential effect on public health and the environment during construction and/or implementation.

Implementation of the storm sewer IRM could result in short-term exposure of the surrounding community and workers to site impacts as a result of excavation, material handling, and off-site transportation activities. Potential exposure mechanisms include ingestion and dermal contact with impacted soil and/or groundwater and inhalation of volatile organic vapors or dust containing impacts during IRM construction. Potential

exposure of remedial workers would be minimized through the use of appropriately trained field personnel and personal protective equipment (PPE), as specified in a site-specific health and safety plan (HASP) that would be developed by the remedial contractor.

Additional worker safety concerns include working with and around large construction equipment, noise generated from operating construction equipment, and increased vehicle traffic associated with transportation of excavated material from the work area and delivery of fill materials.

Potential short-term impacts would be minimized by restricting access to the work area and using engineering controls and appropriate health and safety practices. As described in the Appendix F -Waste Management Plan, haul trucks will be required to follow designated routes to minimize disruption to the community. The storm sewer IRM is anticipated to require approximately four to five months to construct, and some disruption to truck traffic associated with the warehouse facility is anticipated throughout construction.

4.2.2 Long-Term Effectiveness and Permanence

The evaluation of the storm sewer IRM relative to long-term effectiveness and permanence is made by considering the risks that may remain following IRM construction.

Historically, impacted groundwater has deteriorated and infiltrated the existing storm sewer system. As indicated in Section 3, the overall objective of the storm sewer IRM is to provide a water-tight (i.e., zero-leakage) storm sewer system. The use of HDPE piping and manholes will provide a chemically-compatible pipe material and water-tight storm sewer system. Additionally, pipe bedding materials have been designed to provide a chemically-resistant backfill material from the corrosive groundwater conditions (i.e., that will remain for a period of time following IRM construction). Although the storm sewer IRM will not address the source of the groundwater impacts (i.e., purifier waste located north of the storm sewer), the IRM will effectively isolate remaining impacted groundwater from surface water flows until the purifier waste area is addressed through additional remedial activities.

4.2.3 Land Use

This criterion evaluates the current and intended future land use of the property relative to the cleanup objectives when unrestricted use cleanup levels would not be achieved. This evaluation considers local zoning laws, proximity to residential property, accessibility to infrastructure, and proximity to natural resources including groundwater drinking supplies.

As indicated in Section 1, the Krasdale property is currently zoned for manufacturing. Implementation of the storm sewer IRM is not anticipated to alter current or anticipated future use of the property.

4.2.4 Reduction of Toxicity, Mobility, and Volume through Treatment

This evaluation criterion addresses the degree to which the remedial activity will permanently reduce the toxicity, mobility, or volume of the constituents present in the media through treatment.

The storm sewer IRM consists of soil excavation (an estimated 600 cubic-yards) to facilitate installation of a new storm sewer pipe. Approximately half of the material to be excavated is assumed to consist of purifier waste, which ultimately serves as the source of low pH groundwater conditions. Excavated soil will transported off-site for disposal. Additionally, groundwater (an estimated 20,000 to 40,000 gallons) will be collected from the pipe trench excavation limits and transported off-site for treatment and disposal.

The mobility of impacted groundwater (i.e., that previously infiltrated the existing storm sewer system and discharged to the Bronx River) will be significantly reduced due to the zero leakage and chemically-compatible pipe and low-permeability and chemically-resistant CLSM backfill.

4.2.5 Implementability

This criterion addresses the technical and administrative feasibility of implementing the remedial activities, including the availability of the various services and materials required for implementation.

The storm sewer IRM is considered both technically and administratively implementable. Remedial contractors capable of constructing the storm sewer IRM are

readily available. Potential implementation challenges associated with IRM include coordinating construction activities to minimize disruption to warehouse facility operations and other local business. As indicated previously, haul trucks will be required to follow designated routes to minimize potential disruptions. As described in Section 5, sheet pile will be installed to provide excavation stability, as well as minimize the quantity of impacted soil generated and minimize infiltration of impacted groundwater into the excavation areas (i.e., thereby minimizing the quantity of materials requiring off-site transportation for treatment/disposal). Additionally, constructing the new storm sewer outfall (i.e., completing the end of the CLSM-backfilled trench, removing existing rip rap and installing new rip rap) along the bank of the Bronx River may present minor implementation challenges.

Administratively, an access agreement will be required to construct the storm sewer IRM. The storm sewer and proposed project work area are located on property not owned by Con Edison. Required permits will be identified and obtained to facilitate the storm sewer IRM construction.

4.2.6 Compliance with SCGs

This criterion evaluates the remedial activity's ability to comply with potentially applicable federal, state, and local standards, criteria, and guidance (SCGs).

The storm sewer IRM is expected to remove several hundred cubic-yards of MGP-related purifier waste material. However, purifier waste and impacted groundwater will remain below and adjacent to the new storm sewer. Therefore, the storm sewer IRM is not anticipated to achieve chemical-specific SCGs such as 6 NYCRR Part 375-6 soil cleanup objectives (SCOs) or NYSDEC Class GA standards and guidance values. Excavated material and process residuals would be managed and characterized in accordance with 40 CFR 261 and 6 NYCRR Part 371 regulations to determine off-site treatment/disposal requirements. NYS land disposal restrictions (LDRs) would apply to any materials that are characterized as a hazardous waste.

Potentially applicable action-specific SCGs include health and safety requirements and regulations associated with handling impacted media. Work activities would be conducted in accordance with Occupational Safety and Health Administration (OSHA) requirements that specify general industry standards, safety equipment and procedures, and record keeping and reporting regulations. Compliance with these action-specific SCGs would be accomplished by following a site-specific HASP. Excavated soil and process residuals would be subject to United States Department of

Transportation (USDOT) requirements for packaging, labeling, manifesting, and transporting hazardous or regulated materials. Compliance with these requirements would be achieved by using licensed waste transporters and permitted disposal facilities.

Applicable location-specific SCGs generally include local building/construction codes and ordinances and necessary street work permits. Local permits will be obtained prior to initiating the storm sewer IRM, as discussed in Section 5.

4.2.7 Overall Protection of Public Health and the Environment

This criterion evaluates whether the remedial activity provides adequate protection of public health and the environment.

As indicated previously, the storm sewer IRM activities will effectively isolate remaining impacted groundwater from surface water flows until the purifier waste area is addressed through additional remedial construction activities. Therefore, the storm sewer IRM will prevent discharge of contaminated groundwater to surface water (RAO #1) and work toward preventing the migration of impacts (RAO #3). The storm sewer IRM will effectively remove (or otherwise address) impacted soil and groundwater (RAO #2) within the immediate vicinity of the storm sewer alignment to a depth of approximately two feet below the existing pipe.

4.2.8 Cost Effectiveness

This criterion evaluates the overall cost of the IRM relative to the effectiveness of the alternative (i.e., cost compared to long-term effectiveness and permanence, short-term impacts and effectiveness, and reduction of toxicity, mobility, and volume through treatment).

The overall cost of the storm sewer IRM is anticipated to be relatively low, compared to the total cost associated with remedial construction activities needed to address remaining impacts (which will be evaluated as part of future site activities). Therefore, the storm sewer IRM provides a cost effective means to address the discharge of impacted groundwater to surface water until additional remedial activities can be evaluated, developed, and implemented at the site.

4.2.9 Community Acceptance

This criterion is evaluated after the public review of the NYSDEC-approved storm sewer IRM activities. NYSDEC will be responsible for coordinating and conducting the public review of this IRMWP (if necessary).

5. Pre-Construction Activities

The following section describes activities to be completed prior to Contractor mobilization.

5.1 Contractor Pre-Mobilization Submittals

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

- Contractor's Operations Plan
- Health and Safety Plan
- Contractor's schedule and detailed sequencing plan

Specification Sections 01 11 00 – Summary of Work and 01 33 00 – Submittals (Appendix C) presents additional requirements regarding the content of these Contractor pre-mobilization submittals and the overall submittal process.

5.2 Permitting

The Contractor will be responsible for coordinating and obtaining any other pertinent and applicable local, state, or federal permits associated with the implementation of the construction activities outlined in this IRMWP. One such permit(s) required for utility work will be through the New York City Buildings Department – Bronx Borough. The contact information for that agency is 1932 Arthur Avenue, 5th Floor, Bronx, New York 10457 (718) 960-4720. However, pursuant to 6 New York Codes, Rules, and Regulations Part 375-1.12 (Permits), the NYSDEC may exempt a party from the requirement to obtain any NYSDEC-issued permits for which the substantive requirements are met. Prior to implementing the construction activities, Con Edison will satisfy notification requirements and obtain applicable review required by the NYSDEC.

5.3 Pre-Remediation Waste Characterization Sampling

Prior to the remedial construction activities, Con Edison will conduct pre-remediation sampling to characterize soil to be excavated. Sampling will be conducted in accordance with the analytical and sampling frequency requirements provided by anticipated waste disposal/treatment facilities.

The results of the pre-remediation sampling and laboratory analyses will be used to evaluate the disposal/treatment options for materials generated during the construction activities.

In general, available analytical results for soils in the proposed excavation area are indicative of non-hazardous waste, however, soil/fill impacted with visible non-aqueous phase liquid, containing total PAHs at concentrations greater than or equal to 500 milligrams per kilogram, or that is characteristically hazardous for benzene will be treated by low-temperature thermal desorption. Soil that does not exceed these criteria will be disposed at a Con Edison-approved non-hazardous waste disposal facility (see Appendix F – Waste Management Plan, Exhibit A). Documentation between the Contractor and the disposal facility identifying the type of material to be disposed and indicating that the disposal facility will accept the waste material will be provided to NYSDEC prior to off-site disposal of material generated during the storm sewer replacement.

6. Construction Activities

This section presents a task-by-task summary of the storm sewer replacement activities to be completed as part of this project. A description of each construction task, including references to supporting information presented elsewhere in the Contract Documents, is presented in the following subsections.

6.1 Task 1 – Mobilization

Site mobilization will be initiated by the Contractor after notification from Con Edison to proceed. In general, mobilization activities include bringing personnel, equipment, and materials to the site to support the construction activities. Mobilization activities to be conducted by the Contractor include, but are not limited to, the following:

- Mobilizing necessary labor, equipment, materials, tools, and supervision to commence work on the project.

- Coordinating with Dig Safely New York prior to construction activities to mark all on-site underground utilities.

- Mobilizing and establishing two field office trailers to be utilized by the Contractor, the Oversight Engineer, and the NYSDEC during implementation of the construction activities. The trailers (and supporting telephone and internet services) will conform to the requirements presented in Specification Section 01 50 00 – Temporary Facilities and Controls (Appendix C).

- Establishing electrical service, as necessary, for use during the construction activities.

- Providing and maintaining portable sanitary services for use by on-site personnel engaged in the construction activities. The Contractor will be responsible for determining the location of the portable sanitary services as part of the Temporary Facilities Plan submittal. Portable sanitary services will conform to the requirements presented in Specification 01 50 00 – Temporary Facilities and Controls (Appendix C).

6.2 Task 2 – Site Preparation

In general, the Contractor will conduct the following site preparation activities:

- Verify existing site conditions and identify, mark, and verify the location(s) of all aboveground and underground utilities, equipment, and structures, as necessary, to implement the construction activities. The Contractor will also be responsible for maintaining appropriate clearances from utilities (e.g., active overhead electric lines, underground conduit/piping). If the Contractor damages existing utilities, equipment, or structures, the Contractor will be responsible for notifying the appropriate utility company/municipality and fully repairing all damages at no additional cost to Con Edison. Repairs (if necessary) will be completed in accordance with all requirements of the utility company/municipality and to the satisfaction of the Oversight Engineer.

- Install temporary site security fence around the perimeter of the Project Construction Area, as shown on the Design Drawings (Appendix B).

- Install site access gates to Parcel D. The primary access gate for all vehicle traffic will be located on the northwestern side of the site along Food Center Drive. The Contractor will be responsible for installing the necessary provisions for crossing the inactive railroad tracks and stabilized construction entrance. In addition, two personnel gates will be installed at the northeastern end of the site for emergency use only. See the Design Drawings (Appendix B) for gate locations. Contractor plans for site entrance shall be reviewed and approved by NYC EDC.

- The Contractor shall install all temporary construction facilities (i.e., water management system, decontamination area, equipment staging area, and office trailer support areas within the limits of the Area for Contractor Use necessary to perform the work. The Contractor will install a temporary surface cover system over the area as shown on Design Drawing 9 (Appendix B).

- Install temporary erosion and sedimentation control measures at the Krasdale property and Parcel D. Control measures will be installed in accordance with Design Drawings 3 and 9 (Appendix B) and Specification Section 31 25 13 – Erosion and Sedimentation Control (Appendix C). Erosion and sedimentation control measures will be maintained and inspected in accordance with the Stormwater Pollution Prevention Plan (SWPPP) (Appendix D).

- Deploy work zone air monitoring equipment for worker health and safety monitoring, as required, prior to initiating intrusive activities. Although the Oversight Engineer will be responsible for conducting community air monitoring in accordance with Specification Section 02 50 70 – Odor, Vapor, and Dust Control

(Appendix C) and the Community Air Monitoring Plan (CAMP) (Appendix E), the Contractor will verify daily that community air monitoring is being conducted prior to initiating intrusive site activities.

- Construct decontamination area. The Contractor will construct a decontamination area for decontaminating trucks, equipment, and personnel that come into contact with potentially impacted materials during implementation of the construction activities. The Contractor will be responsible for determining the location of the decontamination area as part of the Temporary Facilities Plan submittal to be reviewed and approved by NYC EDC. A section view of the minimum requirements for the decontamination area is presented on Design Drawing 9 (Appendix B).

- Construct temporary water management system containment area. The Contractor will construct a containment area for housing the temporary water management system that will be operated during implementation of the construction activities. The Contractor will be responsible for determining the location of the temporary water management system containment area as part of the Temporary Facilities Plan submittal to be reviewed and approved by NYC EDC. A section view of the minimum requirements for the water management system containment area is presented on Design Drawing 9 (Appendix B).

- Stage materials and equipment in designated areas at the site. Available areas to be used by the Contractor are shown on Design Drawing 3 (Appendix B).

Refer to Design Drawing 3 (Appendix B) and Specification Sections 01 14 13 – Site Security and Access, 01 35 43 – Environmental Controls, and 01 50 00 – Temporary Facilities and Controls for additional information regarding site preparation activities.

6.3 Task 3 – Noise, Dust, Vapor, and Odor Suppression/Control

During installation of excavation support systems, the Contractor will maintain noise levels produced by construction equipment to safe and tolerable limits, as set forth by Occupational Safety and Health Association, the United States Environmental Protection Agency, and any applicable New York State or local code ordinances. All construction equipment posing a potential noise nuisance will be equipped with noise-muffling devices by the Contractor.

As required by the New York State Department of Health's (NYSDOH's) Generic CAMP, real-time airborne particulate monitoring will be conducted continuously during

all intrusive and/or potential dust-generating activities (e.g., sheet pile installation, excavation, backfilling, material handling activities) using instrumentation equipped with electronic data-logging capabilities. Additionally, as required by the NYSDOH's Generic CAMP, volatile organic compounds (VOCs) will be monitored continuously during all intrusive and/or potential dust-generating activities. Odors associated with MGP-related impacts to soil are anticipated to be generated during intrusive activities. The Oversight Engineer will be responsible for conducting community air monitoring. However, the Contractor will address dust, vapors, and odors, including hydrogen cyanide and hydrogen sulfide in accordance with the CAMP (Appendix E) and Specification Section 02 50 70 – Odor, Vapor, and Dust Control (Appendix C). The following dust, vapor, and odor control measures may be used during these activities, depending upon specific circumstances, visual observations, and air monitoring results:

- Water/BioSolve® spray
- Polyethylene sheeting (e.g., for covering excavation faces, material stockpiles)
- Minimizing excavation surface area to be exposed at any given time
- Vapor suppression foam

A more detailed description of the air monitoring program, including routine requirements, action levels for increased monitoring, provisions for corrective actions to address air emissions, and/or provisions for modifications/work stoppage, is provided in the CAMP (Appendix E) and Specification Section 02 50 70 – Odor, Vapor, and Dust Control (Appendix C).

6.4 Task 4 – Excavation Area Dewatering and Water Management

The Contractor will provide, mobilize, install, operate, and maintain a temporary on-site water management system to manage water generated during the construction activities. This may include, but is not limited to, the following:

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

Water management will consist of suspended solids removal from the above-identified sources prior to transportation for off-site treatment and subsequent disposal at a Con Edison-approved and licensed facility (see Appendix F – Waste Management Plan, Exhibit A for Con-Edison-approved facilities).

The temporary water management system will be installed at a location that will not interfere with excavation operations and provides suitable truck access to support off-site haulage.

6.5 Task 5 – Excavation

Excavation operations to be completed by the Contractor as part of the construction activities include installing the excavation support system to provide excavation sidewall support and excavating a trench to facilitate replacement of the storm sewer. Design Drawings 4 and 5 (Appendix B) show the horizontal and vertical limits of excavation. The excavation operations are described below.

6.5.1 Installation of Excavation Support System

The proposed sheetpile wall alignment is shown on Design Drawing 4 (Appendix B), and details related to installation of sheet piling are presented in Specification Section 31 50 00 – Excavation Support (Appendix C). Sequencing of the sheet pile installation in coordination with excavation will be determined by the Contractor.

Soil boring information is available in the 2013 Pre-Design Investigation Report (Appendix G).

6.5.2 Soil Excavation

The Contractor will excavate soil to facilitate replacement of the new storm sewer. The Contractor will be required to dewater the excavation during soil removal activities. Water generated during dewatering will be conveyed to a temporary on-site water management system for treatment, as described above in Section 5.4.

The Contractor will conduct the excavation operations using conventional construction equipment, such as excavators and/or backhoes to the limits shown on the Design Drawings. Specification Section 31 23 00 – Excavation and Dewatering (Appendix C) presents details related to advancement of the soil excavation. Sequencing of the excavation in coordination with sheet pile installation is to be determined by the Contractor.

All excavated materials will be direct-loaded for off-site disposal in accordance with the Waste Management Plan (Appendix F) and Specification Section 01 74 19 – Off-Site Disposal (Appendix C). Any saturated materials requiring stabilization will be addressed

via a stabilization agent (i.e., Portland cement) and blended within the excavation area prior to direct loading for off-site disposal.

6.6 Task 6 – Storm Sewer Replacement

6.6.1 Removal of Existing Storm Sewer

Following installation of the steel sheet piling and excavation, the Contractor will completely remove the existing storm sewer system, including catch basins and reinforced concrete pipe. Storm water runoff that would otherwise have entered the catch basin will be diverted toward the Bronx Rover and suspended solids will be managed via erosion and sedimentation controls. Details regarding demolition can be found in Specification Section 02 41 00 – Demolition (Appendix C) and on the Design Drawings (Appendix B).

6.6.2 Installation of New Storm Sewer

The new storm sewer piping and manholes (catch basins) will be constructed using HDPE 12- and 20-inch nominal pipe diameter. Pipes are to be a standard dimension ratio of 11. The joints between the catch basins and piping will be flanged. All other joints in the piping will be butt fused welded. The catch basins will be prefabricated by the manufacturer in accordance with the applicable specification sections and Design Drawings. The pipes and catch basins are to be installed on a 2-foot minimum thick CLSM mud mat. The CLSM will also be used to backfill the piping, flanged connections, and a portion of each catch basin. Details regarding the storm sewer installation are presented in Specification Sections 03 00 05 – Concrete, 33 05 05 – Buried Pipe Installation, 33 05 14 – High Density Polyethylene (HDPE) Catch Basins, and 40 05 33 – High Density Polyethylene (HDPE) Pipe (Appendix C) and in the Design Drawings (Appendix B).

6.7 Task 7 – Decontamination Activities

The Contractor will be responsible for conducting decontamination activities, as necessary, for all personnel and equipment that come in contact with impacted materials at the site. The Contractor will decontaminate equipment and personnel in the equipment decontamination area and personnel decontamination area.

At a minimum, the Contractor will decontaminate equipment and materials that come in contact with impacted site media (including, but not limited to, excavation equipment,

loaders, trucks, sheetpile, tanks, pumps, and hand-tools) prior to handling clean materials and prior to demobilizing the equipment and materials from the site. The equipment decontamination is required to prevent cross-contamination on site and off site. In addition, decontamination of the construction equipment is necessary for travel over public road ways and to prevent potential transfer of contamination to other future work sites.

The Contractor will select the means and methods (as part of their Site Operating Plan) for decontaminating equipment, materials, and personnel. The Contractor will be required to complete the following cleaning procedures (at a minimum):

- Visual inspection of each transport vehicle will be performed before leaving the loading area. The Contractor will remove accumulations of soil on the vehicle tires or other exterior surfaces manually or, if necessary, by using a high-pressure water and/or steam spray in the equipment decontamination area.

- Decontaminating material handling equipment that has come into contact with impacted soils in the equipment decontamination area before it enters non-work areas, handles “clean” materials (e.g., backfill), or leaves the site. The Contractor will manually clean equipment, using a high-pressure water spray and/or steam cleaning or other appropriate measures identified by the Contractor and approved by the Oversight Engineer.

- Precautions will be taken to limit contact between the equipment, personnel performing the decontamination activities, and any cleaning liquids/debris that may accumulate in the decontamination area.

- Managing liquid materials, such as decontamination water (and other residual material collected during equipment decontamination) will be at the temporary on-site water management system for off-site transportation and disposal in accordance with the Waste Management Plan (Appendix F) and Specification Section 01 74 19 – Off-Site Disposal (Appendix C). Holding tanks will be proposed by the Contractor and will be decontaminated after final use to the satisfaction of the Oversight Engineer.

- Containerizing solids and other waste materials generated by equipment decontamination for off-site disposal in accordance with the Waste Management Plan (Appendix F) and Specification Section 01 74 19 – Off-Site Disposal

(Appendix C). When impacted soil transport activities are in progress, the residual solid wastes may be included with the off-site shipments of impacted soil.

- Conducting visual inspection of equipment and materials (including, but not limited to, excavation equipment, loaders, trucks, sheetpile, tanks, pumps, and hand-tools) following final equipment cleaning. If the visual inspection indicates that waste materials remain (based on the opinion of the Oversight Engineer), the Contractor will re-clean the equipment, and an additional inspection will be performed by the Contractor and the Oversight Engineer. The Contractor will perform decontamination activities until no visible soil, debris, or stains are present on the equipment surfaces (to the satisfaction of the Oversight Engineer). Unless otherwise directed by the Oversight Engineer, any equipment to be taken off site by the Contractor will be subject to a visual review by the Oversight Engineer and cleaning (or additional cleaning, as necessary, at no additional cost to Con Edison) in the decontamination area.

- Decontaminating the temporary on-site water management system following completion of water management activities. The Contractor will remove and temporarily containerize any accumulated material. The Contractor will clean treatment system components by high-pressure water spray or flushing.

6.8 Task 8 – Site Restoration

Site restoration will consist of restoring the disturbed areas of the site due to implementation of the storm sewer replacement project. Site restoration will include backfilling activities and final site restoration and are discussed below.

6.8.1 Backfilling

After the excavation has been advanced to the required depth, the Contractor will begin backfilling the excavation with CLSM to the base of the new sewer pipe elevation. After installing sections of the new storm sewer pipe to the design specifications (i.e., locations, elevations, and slopes), the Contractor may be permitted to continue backfilling portions of the trench to an elevation of 2 feet above the top of the pipe. After the CLSM has been allowed to cure for 24 hours, the remaining general fill may be placed in accordance with the design. NYSDEC approval will be required prior to importing backfill to the site. Specification Section 31 23 10 – Fill Materials (Appendix C) presents details related to backfill materials.

At least 3 weeks prior to bringing backfill on site, the Contractor will provide analytical results for all backfill source(s). Laboratory analysis for polychlorinated biphenyls (PCBs), pesticides, Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), and Target Analyte List metals will be performed. The allowable constituent levels for imported fill for Commercial or Industrial use are presented in Appendix 5 of the NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10). Alternate sources of backfill will be identified by the Contractor if unacceptable sample results are obtained for the Contractor's proposed fill. The Contractor will be responsible for all analytical costs. At least one sample from each backfill source will be required, with a sampling frequency as follows:

- For material being imported from a virgin mine/pit, one round of characterization samples will be required for each backfill type to be obtained from the mine/pit.

- For material sources other than a virgin mine/pit, two rounds of characterization samples will be required for each backfill type to be obtained from the source(s).

The samples for VOC analysis will be discrete grab samples, and the samples for PCB, pesticides, SVOC, and inorganic constituent analysis will be composite samples.

The Contractor will also be responsible for providing the Oversight Engineer with sieve analysis reports and moisture/density test results for the proposed select fill material as described in Specifications Section 31 23 10 – Fill Materials (Appendix C).

Prior to placing backfill, the Contractor will remove standing water (precipitation or surface-water runoff) and groundwater, if any, that accumulates within the excavation area. All water will be pumped/transferred to the temporary water management system for off-site treatment and disposal.

In general, the Contractor will place and compact the general fill in 1-foot lifts. The Contractor will retain and pay all costs for soil compaction testing to be performed by an independent testing laboratory. Compaction testing will be performed every 75 linear feet of pipe for each lift. All backfill will be compacted to a minimum of 95% of maximum dry unit weight as determined by Modified Proctor testing (American Society for Testing and Materials [ASTM] Method D1557). The testing laboratory will test soils in accordance with ASTM D2922 (nuclear method).

The final restored surfaces will be constructed to support H-25 USDOT load ratings, consistent with the pre-construction land-use.

The Contractor will be responsible for obtaining documentation from the backfill source for the weight of each backfill load (weight tickets) for invoice payment purposes. The Contractor will provide the Oversight Engineer with weight tickets for each load of imported backfill upon delivery to the site.

The temporary surface cover system will remain in place to protect human health and the environment from exposure to the underlying soils as well as serve a construction support area for potential future work activities at Parcel D.

6.9 Demobilization

Demobilization from the site will commence following the completion of the site restoration work. Demobilization will include the following:

- Dismantling the work area(s), temporary water management system containment area, and equipment and material decontamination areas.
- The temporary surface cover system will remain in place to protect human health and the environment from exposure to the underlying soils as well as serve as a construction support area for potential future work activities at Parcel D.
- Removing certain erosion and sedimentation control measures as discussed in Section 5.2.
- Transporting residual wastes (e.g., disposable equipment, personal protective equipment, sampling equipment, cleaning residuals) remaining at the completion of the construction activities for off-site treatment and disposal in accordance with applicable rules and regulations. Characterization sampling of the residual wastes (if needed) will be performed by the Oversight Engineer.
- Removing all Contractor equipment, materials, and personnel from the site.

7. Schedule

This section presents the preliminary project schedule for NYSDEC review of the Contract Documents and contractor procurement activities. The selected Contractor will be responsible for development of a remedial construction schedule.

Once this IRMWP is approved by NYSDEC, a schedule for pre-site mobilization project activities (contractor procurement, access negotiations, permitting, etc.) will be developed. The selected Contractor will be responsible for development of a remedial construction schedule.

Initiation of remedial construction will be contingent on meeting the above-defined schedule components and receipt of all required permits and approvals. The storm sewer replacement schedule is also subject to change based on NYSDEC approvals, contractor and material availability, unanticipated seasonal variations, and other factors. The selected contractor will develop a revised schedule based on the planned work sequencing and productivity associated with implementation of the storm sewer replacement.

8. Reporting and Documentation of Site Activities

8.1 Documentation

Site activities will be documented by completing the daily field construction reports, logs, and forms noted below.

8.1.1 Daily Field Construction Report

A daily field construction report will be prepared by the Oversight Engineer to document daily on-site activities. The daily field construction reports will be submitted the following business day in an electronic format to Yelena Skorobogatov, Con Edison's Project Manager, at SkorobogatovY@coned.com.

8.1.2 Daily Construction Site Management Plan Inspection Form

The Oversight Engineer will prepare a daily construction site management plan (CSMP) inspection form to document the condition of the engineering controls and best management practices presented in the CSMP (Appendix H). The daily CSMP reports will be submitted the following business day in electronic format to Yelena Skorobogatov, Con Edison's Project Manager, at SkorobogatovY@coned.com and Tracey Bell (NYC EDC), at tbell@nycedc.com.

8.1.3 Weekly Stormwater Pollution Prevention Plan Inspection Report

The Oversight Engineer will prepare a weekly inspection report to document the performance of the SWPPP controls presented in the SWPPP (Appendix D).

8.1.4 Monthly Progress Report

The Oversight Engineer will prepare monthly progress reports (MPRs) to document the progress of the work. The MPRs will be submitted to the NYSDEC within one week following the month of reporting period.

8.1.5 Transportation Log

A transportation log will be prepared by the Oversight Engineer to document all loads of solid or liquid waste that are transported off site. The transportation log will be

submitted at the end of each week in an electronic format to Yelena Skorobogatov, Con Edison's Project Manager, at SkorobogatovY@coned.com

8.1.6 Daily Community Air Monitoring Report

A daily community air monitoring report will be prepared by the Oversight Engineer to document daily air monitoring results. The daily community air monitoring reports will be maintained on site and submitted to the NYSDEC and/or NYSDOH, if requested.

8.1.7 Master Sample Log

A laboratory notebook will remain in the field office to record every sample collected. The Oversight Engineer will log all samples collected and those sent to the off-site analytical laboratory. Waybill numbers will be logged at the end of each day.

8.1.8 Chain of Custody Record

A chain of custody form will be used to document custody of all samples from the field to the laboratory. The selected off-site analytical laboratory will provide the chain of custody forms.

8.1.9 Waybills

A waybill receipt will be obtained when a sample shipment is accepted by a courier and will be attached to the Master Sample Log.

8.2 Construction Completion Report

Upon completion of the remedial construction activities, a Construction Completion Report (CCR) will be prepared by the Project Engineer for submittal to Con Edison and, subsequently, to the NYSDEC. In general, and in conformance with the intent of Section 5.8(b) of DER-10 (NYSDEC 2010), the CCR will present, at a minimum, the following information:

- Description of the activities completed in accordance with the approved design, including problems encountered and variations (if any) from the NYSDEC-approved Final IRMWP.

- Record drawings, tables, and figures detailing the remedial activities completed.

- Certification statement.

- Information and documentation regarding the final quantities and disposition of materials disposed/treated off site during implementation of the remedial activities, including executed manifests and bills of lading.

The CCR will be prepared in a format consistent with available templates for final engineering reports presented on the NYSDEC website. A professional engineer licensed in New York State will sign and seal the CCR, including the record drawings and a certification statement.

9. References

ARCADIS, 2011. Dry Weather Discharge Evaluation Work Plan – Krasdale Foods, Inc., Leasehold. Hunts Point Former Manufactured Gas Plant. Consolidated Edison Company of New York, Inc. Bronx, New York. January. Revised August.

ARCADIS. 2013. Site Characterization Report – Krasdale Foods, Inc., Leasehold. Hunts Point Former Manufactured Gas Plant. Consolidated Edison Company of New York, Inc. Bronx, New York. May.

New York City Department of City Planning. 2013

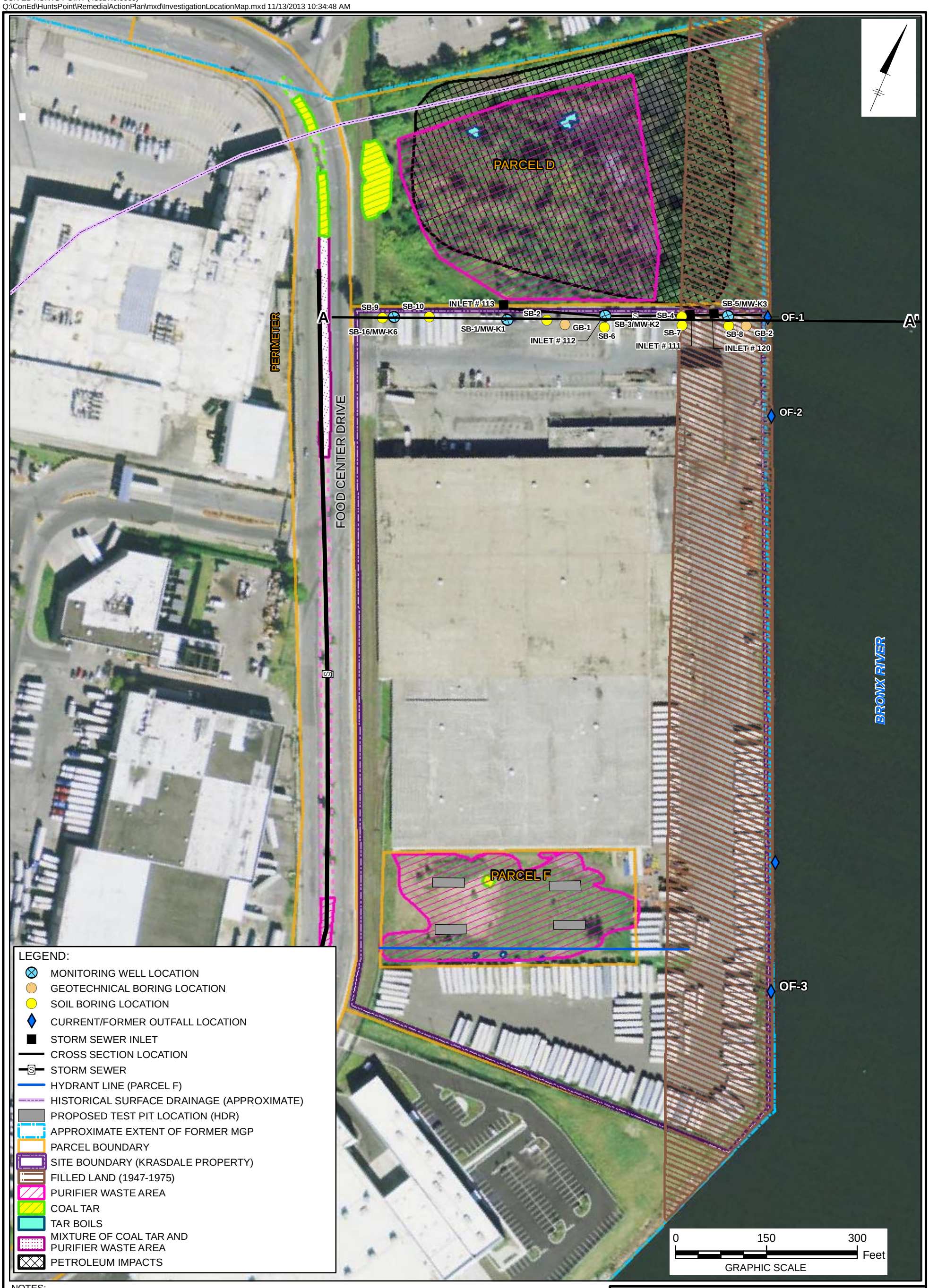
New York State Department of Environmental Conservation. 2010. DER-10 Technical Guidance for Site Investigation and Remediation. May 3, 2010.

New York State Department of Health. 2000. Generic Community Air Monitoring Plan. June.

ARCADIS

Figures

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\RemedialActionPlan\mxd\InvestigationLocationMap.mxd 11/13/2013 10:34:48 AM



NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).

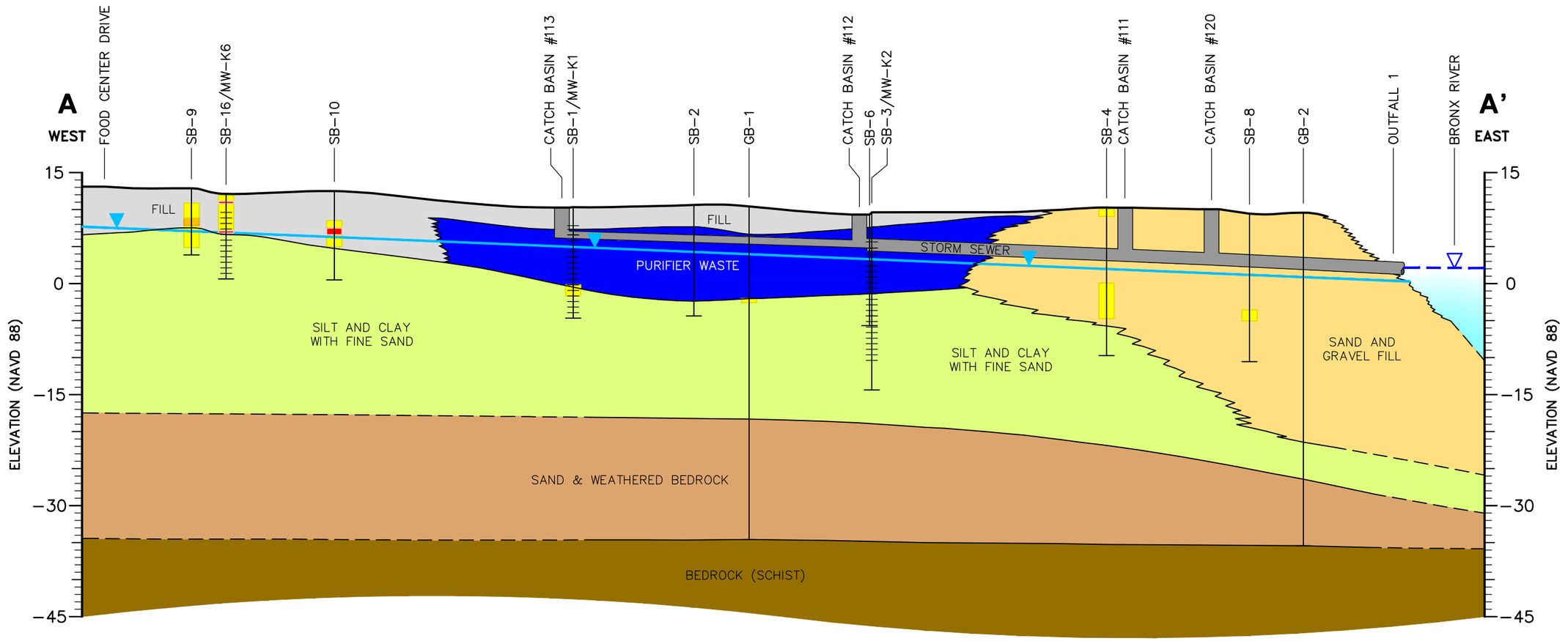
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

INTERIM REMEDIAL MEASURE WORK PLAN

CROSS SECTION LOCATION MAP

ARCADIS

FIGURE
1



VERTICAL EXAGGERATION = 4X

0 15' 30'

VERTICAL SCALE

0 60' 120'

HORIZONTAL SCALE

LEGEND:

SB-10
WELL OR BORING ID
GROUND SURFACE
GROUNDWATER
LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
SCREEN
BOTTOM OF BORING

RIVER
FILL
SAND AND GRAVEL FILL
SILT AND CLAY WITH FINE SAND
SAND AND WEATHERED BEDROCK
BEDROCK

STAINING, ODOR
SHEEN
TAR SATURATED
PURIFIER WASTE/ODOR

NOTES:

1. COORDINATES ARE BASED ON NAD 83, NEW YORK LONG ISLAND STATE PLANE.
2. VERTICAL DATUM BASED ON NAVD 88.
3. BORING INFORMATION FOR GP-01 WAS OBTAINED FROM THE INVESTIGATIVE REPORT FOR PARCEL D, BRONX, NEW YORK, PREPARED BY LAWLER, MATUSKY & SKELLY ENGINEERING, LLP, OCTOBER 2005.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SEE FIGURE 1 FOR CROSS SECTION LOCATION.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT
INTERIM REMEDIAL MEASURE WORK PLAN

CROSS-SECTION A-A'

ARCADIS

FIGURE
2

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB:R. ALLEN LD:(Opt) PIC:(Opt) PM:J. BRIEN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB\043027\0005\00020\DWG\IRM_WP\43027G02.dwg LAYOUT: 2 SAVED: 8/13/2014 8:05 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES:
43027XBL

ARCADIS

Appendix A

NYSDEC Approval Letter

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B, 12th Floor
625 Broadway, Albany, New York 12233-7016
Phone: (518) 402-9768 • **Fax:** (518) 402-9773
Website: www.dec.ny.gov

Joe Martens
Commissioner

October 25, 2011

Ms. Yelena Skorobogatov
Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City, NY 11105-2048

Re: Voluntary Cleanup Project
Hunts Point MGP
City of New York, Bronx County
Site No.: V00554
Pre-Design Investigation Work Plan
Operable Unit No. 2 – Discharge Pipe

The New York State Department of Environmental Conservation ("Department") has completed its review of the Pre-Design Investigation Work Plan, dated September 30, 2011, for the Hunts Point MGP Site, Operable Unit No. 2 (OU2). Based on this review, the document is hereby approved provided that the samples are analyzed for polychlorinated biphenyls (PCBs), in addition to TCL volatile organic compounds, TCL semi-volatile organic compounds, TAL metals, total and free cyanide, and pH. The Department believes that PCB analysis is necessary to rule out the possibility that PCB contamination may exist in on-site soils or groundwater. PCBs have been detected in site soils at the Con Edison Gas Compressor Station Site (Site No. V00605) and the Hunts Point Parcel E, OU3 Site (Site No. V00682). Furthermore, the inclusion of PCB analysis is consistent with the analyses that have been performed at other Hunts Point sites, including: Hunts Point Parcel A, OU1 & OU2 (Site No. V00233), Hunts Point Parcel B (Site No. V00436); Hunts Point Parcel C, OU1 & OU2 (Site No. V00412), Hunts Point Parcel E, OU1 (Site No. V00414), Hunts Point Parcel E, OU2 (Site No. V00681), Hunts Point Parcel D (Site No. V00683), and Hunts Point Parcel F (Site No. V00671). If no PCBs are detected during the Site Characterization, these parameters may be excluded from any subsequent Remedial Investigation programs conducted at the site.

A copy of the approved document is required to be kept at the document repositories located at the Office of the Borough President, 851 Grand Concourse, Bronx, New York 10451 and the New York Public Library, Hunts Point Branch, 877 Southern Boulevard, Bronx, New York 10459. If it is acceptable to the document repositories, the work plan may be submitted in electronic format only on computer disk (CD).

INTERNATIONAL YEAR OF FORESTS • 2011

Based on the schedule in the approved work plan, and provided that site access is obtained by the date identified in the tentative schedule (November 11, 2011), it is anticipated that field activities associated with this work plan will commence in November 2011.

If you have any questions, you may call me at (518) 402-9615.

Sincerely,

Ronnie E. Lee, P.E.
Environmental Engineer II
Remedial Bureau B
Division of Environmental Remediation

ec: S. Dewes, DEC
S. Selmer, DOH
E. Louie, CE
K. McCarty, ELM
K. Zias, EDC

ARCADIS

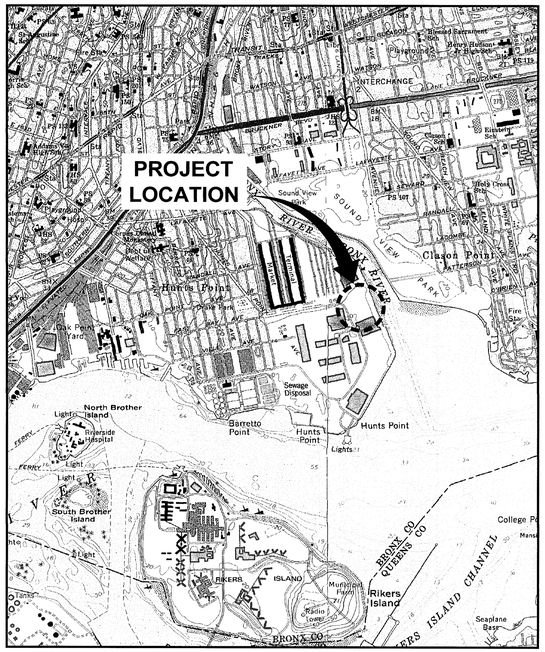
Appendix B

Drawings

DESIGN DRAWINGS

STORM SEWER REPLACEMENT

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MGP SITE
KRASDALE LEASEHOLD
BRONX, NEW YORK



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., CENTRAL PARK AND FLUSHING, NY., 1966. PHOTOREVISED 1979.

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE

DATE ISSUED

SEPTEMBER 2014

ARCADIS

ARCADIS OF NEW YORK, INC.

KEY CONTACTS:

OWNER:
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
31-01 20TH AVENUE, BUILDING 136
LONG ISLAND CITY, NY 11105
TELEPHONE: 718.204.4205
CONTACT: YELENA SKOROBOGATOV

ENGINEER:
ARCADIS OF NEW YORK, INC.
6723 TOWPATH RD.
BOX 66
SYRACUSE, NY 13214
TELEPHONE: 315.446.9120
CONTACT: JASON D. BRIEN

INDEX TO DRAWINGS

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS, K.SARTORI PIC: J BRIEN PM: TM:J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIB0043027\0005\00020\DWG\CONTRACT43027Q01.dwg LAYOUT: COVER SAVED: 9/11/2014 3:52 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:22 AM BY: GETTS, BRIAN
XREFS: IMAGES:
43027X01.tiff
43027X02.tiff

GENERAL NOTES:

1. BASE MAP PROVIDED BY NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION (NYC EDC) SELECT HISTORICAL FEATURES NOT SHOWN FOR CLARITY.

2. NORTH ARROW, BEARINGS, AND COORDINATES BASED ON THE NORTH AMERICAN DATUM OF 1983 (1996 ADJUSTMENT). THE PROJECTION IS NEW YORK – EAST (3101)/NEW JERSEY (2900). GEOID03 WAS USED TO DETERMINE SEPARATION BETWEEN ELLIPSOID HEIGHT AND ORTHOMETRIC HEIGHT.

3. PROJECT CONTROL WAS DETERMINED USING LEICA DUAL–FREQUENCY GPS RECEIVERS. THE REFERENCE MONUMENTS WERE NJI2 (PID #AJ3348) AND LAMT (PID #AJ4872).

4. THE VERTICAL DATUM IS BRONX HIGHWAY DATUM.

5. ALL UNITS SHOWN ON THIS MAP ARE US STANDARD SURVEY FEET.

6. MERCATOR LAND SURVEYING, LLC OF NEW YORK, NEW YORK PREPARED THIS SURVEY BASED UPON THE TITLE REPORTS PREPARED BY OTHERS AND RESEARCH CONDUCTED BY MERCATOR LAND SURVEYING.

7. THE PROPERTY IN QUESTION (PIQ) IS LOCATED IN FLOOD HAZARD ZONE AE (BASE FLOOD ELEVATION 14 & 15 – NGVD29) AND IN FLOOD HAZARD ZONE VE (COASTAL FLOOD ZONE WITH WAVE ACTION) AND IN FLOOD HAZARD ZONE X AS DEPICTED ON FIRM COMMUNITY PANEL NO. 360497 0111F DATED: SEPTEMBER 5, 2007.

8. INFORMATION RELATED TO SUBSURFACE CONDITIONS SHOULD BE CONSIDERED AS GENERALLY REPRESENTATIVE AND SHOULD NOT BE RELIED UPON AS A COMPLETE DEPICTION OF SITE CONDITIONS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INCLUDING ABOVE–GRADE AND SUBSURFACE FEATURES WHETHER OR NOT SHOWN ON DESIGN DRAWINGS OR OTHERWISE DESCRIBED IN THE CONTRACT DOCUMENTS. FAILURE TO VERIFY ALL EXISTING SITE CONDITIONS SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL COMPENSATION.

9. ALL LOCATIONS, INCLUDING PROPERTY LINES, ARE APPROXIMATE, REFLECT AVAILABLE INFORMATION, ARE PROVIDED FOR REFERENCE ONLY, AND ARE SUBJECT TO FIELD VERIFICATION BY THE CONTRACTOR. EASEMENTS AND RIGHTS–OF–WAY ARE NOT SHOWN.

10. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER AND THE OVERSIGHT ENGINEER, UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE WHICH DIFFER MATERIALLY FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS.

11. THE CONTRACTOR SHALL PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE OVERSIGHT ENGINEER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.

12. THE CONTRACTOR SHALL OBTAIN ALL FEDERAL, STATE, AND LOCAL PERMITS REQUIRED TO COMPLETE THE WORK UNLESS EXPLICITLY STATED OTHERWISE IN THE CONTRACT DOCUMENTS.

13. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS.

14. CONTRACTOR TO SIZE THE TEMPORARY FACILITIES AREA APPROPRIATELY TO SUPPORT THE CONSTRUCTION ACTIVITIES.

15. THE TECHNICAL WORK IS DESCRIBED IN SEVERAL DOCUMENTS THAT COLLECTIVELY REPRESENT THE REMEDIAL DESIGN. THESE DOCUMENTS INCLUDE THE DESIGN DRAWINGS, TECHNICAL SPECIFICATIONS, CAMP, CQAP, CSMP, AND WMP. THESE DOCUMENTS SHALL BE THOROUGHLY REVIEWED BY THE CONTRACTOR. ANY DIFFERENCES IDENTIFIED BY THE CONTRACTOR BETWEEN THE INFORMATION PRESENTED IN THE ABOVE–LISTED DOCUMENTS SHALL BE SUBMITTED TO THE DESIGN ENGINEER (IN WRITING) FOR CLARIFICATION.

ABBREVIATIONS:

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AMSL	ABOVE MEAN SEA LEVEL
BGS	BELOW GROUND SURFACE
CAMP	COMMUNITY AIR MONITORING PLAN
CB	CATCH BASIN
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CONT.	CONTINUOUS
CQAP	CONSTRUCTION QUALITY ASSURANCE PLAN
CSMP	CONSTRUCTION SITE MANAGEMENT PLAN
ø OR DIA	DIAMETER
DR OR SDR	(STANDARD) DIMENSIONAL RATIO
DWG.	DRAWING
EF	EACH FACE
EW	EACH WAY
EL.	ELEVATION
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
FL	FLANGED
FT OR '	FOOT
GPM	GALLONS PER MINUTE
HASP	HEALTH AND SAFETY PLAN
HDPE	HIGH DENSITY POLYETHYLENE
IN OR "	INCH
INV.	INVERT
MH	MANHOLE
MAX.	MAXIMUM
MGP	MANUFACTURED GAS PLANT
MIN.	MINIMUM
MIL	ONE THOUSANDTH OF AN INCH
OF	OUTFALL
PE	PLAIN END
PSI	POUNDS PER SQUARE INCH
RCP	REINFORCED CONCRETE PIPE
S	SLOPE
S.S.	STAINLESS STEEL
STA.	STATION
T&B	TOP AND BOTTOM
T.O.S.	TOP OF STRUCTURE
TYP.	TYPICAL
WMP	WASTE MANAGEMENT PLAN

SAFETY NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS IN CONNECTION WITH THE PROJECT. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT SITE WORKERS, CONSTRUCTION OVERSIGHT PERSONNEL, AND SITE VISITORS.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91–596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91–54) AND AMENDMENTS THERETO. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910 AND 29 CFR 1926. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.

3. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL EXCAVATION SHORING/BRACING, SCAFFOLDING, SHIELDING, DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, PROPER WORKING EQUIPMENT WITH FUNCTIONING SAFETY MECHANISMS (E.G., LIFT GATE WARNING SIGNALS), ALL SITE SAFETY SIGNAGE, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS TO SECURE SUCH PROTECTION.

4. THE MATERIALS SUBJECT TO HANDLING AS PART OF THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS, AND SITE VISITORS, AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY. THE CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL BE DEVELOPED IN ACCORDANCE WITH APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS.

5. SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED WITHIN, ADJACENT TO, OR IN THE VICINITY OF THE EXCAVATION/BACKFILL AREAS. THE CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL RECOGNIZE THE TYPES OF ACTIVITIES TO BE PERFORMED, THE UNIQUE HAZARDS SPECIFIC TO THESE ACTIVITIES, AND SPECIAL PRECAUTIONS AND CONTROLS THAT ARE TO BE IMPLEMENTED. OF ADDITIONAL NOTE AND EMPHASIS ARE THOSE ACTIVITIES (E.G., PIPE INSTALLATION, MANHOLE INSTALLATION, ETC.) THAT POTENTIALLY INVOLVE WORK WITHIN THE EXCAVATION AREA ONCE EXCAVATION/BACKFILL ACTIVITIES ARE INITIATED, AND THAT REQUIRE WORKER ACCESS INTO THE EXCAVATED AREA. THE CONTRACTOR SHALL CLEARLY IDENTIFY AND EVALUATE THE SPECIFIC TYPES OF ACTIVITIES THAT COULD INVOLVE WORKER ENTRY INTO THE EXCAVATION AREA, SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTION EQUIPMENT, COMMUNICATIONS, ETC. FURTHER, TO THE EXTENT PRACTICABLE (AS DETERMINED BY THE CONTRACTOR), THE CONTRACTOR IS ENCOURAGED TO MINIMIZE WORKER ENTRY INTO THE EXCAVATED AREA.

6. CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF TRAFFIC ON FOOD CENTER DRIVE AND THE PROPERTY.

7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SAFETY PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY. THIS INCLUDES THE PREPARATION OF A SITE–SPECIFIC HASP PRIOR TO ANY WORK AT THE SITE.

8. SECURITY FENCING SHALL BE INSTALLED AROUND THE AREAS IDENTIFIED AS "FOR CONTRACTOR USE" AND "PROJECT WORK AREA" PER THE SPECIFICATIONS. THE CONTRACTOR SHALL EQUIP EXISTING PERIMETER FENCING AND TEMPORARY FENCING WITH "NO TRESPASSING" SIGNS.

9. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SITE SECURITY MEASURES NECESSARY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLES INTO THE PROJECT CONSTRUCTION AREA (INCLUDING THE OWNERS AND EMPLOYEES OF ONSITE BUILDINGS) DURING BOTH WORKING AND NON–WORKING HOURS (24 HOURS A DAY/SEVEN DAYS A WEEK). MINIMUM SITE SECURITY MEASURES SHALL INCLUDE PERIMETER FENCING/BARRIERS, SIGNAGE, AND AN ON–SITE SECURITY GUARD (DURING NON–WORKING HOURS SEVEN DAYS A WEEK) FROM THE DATE OF INITIAL MOBILIZATION UNTIL THE DATE OF FINAL DEMOBILIZATION. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SITE AND ITS EQUIPMENT AND MATERIALS AT THE END OF EACH WORK DAY.

10. THE TEMPORARY SURFACE COVER SYSTEM SHALL BE INSTALLED OVER ANY PORTION OF THE AREA FOR CONTRACTOR USE SELECTED FOR USE BY THE CONTRACTOR. NO WORK SHALL BE CONDUCTED OVER THE EXISTING SURFACE OF PARCEL D (I.E., AREA FOR CONTRACTOR USE), WITH THE EXCEPTION OF THE INSTALLATION OF THE TEMPORARY SURFACE COVER SYSTEM.

UTILITY NOTES:

1. THE LOCATIONS OF ALL ABOVE– AND UNDERGROUND UTILITIES ARE APPROXIMATE.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND/OR MAINTENANCE OF ABOVE– AND UNDERGROUND UTILITIES DURING CONSTRUCTION. THE LOCATION OF ALL ABOVE– AND UNDERGROUND UTILITIES MUST BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK (1–800–962–7962) AND ALL APPLICABLE UTILITY COMPANIES FOR LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY REMOVAL, RELOCATION, AND REPLACEMENT OF ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE WORK.

3. CONTRACTOR SHALL BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ON–SITE AND/OR OFF–SITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES. ALL REPAIRS/REPLACEMENTS SHALL MEET OR EXCEED EXISTING CONDITIONS.

SITE MANAGEMENT/PROJECT PERFORMANCE NOTES:

1. WORK ACTIVITIES SHALL BE PERFORMED ON NON–HOLIDAY WEEKDAYS (MONDAY THROUGH FRIDAY) BETWEEN THE HOURS OF 7:00 AM AND 6:00 PM EXCEPT IN CASES OF EMERGENCY OR UNLESS PRIOR APPROVAL HAS BEEN OBTAINED FROM CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

2. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO COMPLETE THE STORM SEWER PIPE LINE REPLACEMENT AND RELATED WORK SHOWN ON THE DESIGN DRAWINGS.

3. ALL WORK SHALL BE PERFORMED IN A NEAT AND ORDERLY MANNER, IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, AND BY COMPETENT, EXPERIENCED PERSONNEL. MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH ALL CODES, REGULATIONS, AND REQUIREMENTS OF ALL APPLICABLE CITY, STATE, FEDERAL, AND OTHER PUBLIC OR PRIVATE AUTHORITIES.

4. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF ODORS, VAPORS, AND DUST GENERATED DURING THE WORK. ODORS SHALL BE CONTROLLED TO THE SATISFACTION OF THE OWNER/OVERSIGHT ENGINEER AND NYSDEC AND SUCH THAT NO MGP ODORS ARE DETECTABLE AT THE SITE PERIMETER. VAPORS AND DUST SHALL BE CONTROLLED AS NECESSARY TO MEET THE 1) COMMUNITY AIR MONITORING ACTION LEVELS SET FORTH IN THE CAMP AND 2) WORK ZONE AIR MONITORING ACTION LEVELS SET FORTH IN THE CONTRACTOR'S HASP.

5. REAL–TIME WORK ZONE AIR MONITORING SHALL BE PERFORMED BY THE CONTRACTOR ON A CONTINUOUS BASIS DURING ALL INTRUSIVE AND/OR POTENTIAL DUST–GENERATING ACTIVITIES.

6. COMMUNITY AIR MONITORING WILL BE PERFORMED BY THE OWNER ON A CONTINUOUS BASIS DURING THE REMEDIAL CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL VERIFY THAT COMMUNITY AIR MONITORING IS BEING PERFORMED PRIOR TO INITIATING INTRUSIVE AND/OR POTENTIAL DUST–GENERATING ACTIVITIES (I.E., SITE PREPARATION, EXCAVATION, ETC.) EACH DAY.

7. THE CONTRACTOR SHALL MEET ALL NOISE ORDINANCES AND MAKE EVERY EFFORT TO MINIMIZE NOISE CAUSED BY CONSTRUCTION OPERATIONS. EQUIPMENT SHALL BE EQUIPPED WITH SILENCERS OR MUFFLERS DESIGNED TO OPERATE WITH THE LEAST POSSIBLE NOISE IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL NOISE ORDINANCES.

8. THE CONTRACTOR SHALL PERFORM AND MAINTAIN SURVEY CONTROL THROUGHOUT THE COURSE OF THE WORK. SURVEY DOCUMENTATION OF PRE–CONSTRUCTION, POST–CONSTRUCTION, AND RESTORED CONDITIONS SHALL BE PREPARED AND CERTIFIED BY A LICENSED PROFESSIONAL LAND SURVEYOR. CONTRACTOR SHALL PROVIDE WITH RECORD DRAWINGS AT PROJECT COMPLETION.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY EROSION AND SEDIMENTATION CONTROLS THROUGHOUT CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

10. THE CONTRACTOR SHALL ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT CONSTRUCTION AREA (INCLUDING EXCLUSION, CONTAMINATION REDUCTION, AND SUPPORT ZONES).

11. ALL WORK SHALL BE PERFORMED WITHIN THE PROJECT CONSTRUCTION AREA (I.E., PROJECT WORK AREA AND AREA DESIGNATED FOR CONTRACTOR USE). NO WORK SHALL BE PERFORMED BEYOND THE PROJECT CONSTRUCTION AREA WITHOUT PRIOR APPROVAL FROM THE OWNER/DESIGN ENGINEER.

12. THE CONTRACTOR SHALL REMOVE ABOVEGROUND AND UNDERGROUND NON–EARTHEN MATERIALS (E.G., BRUSH, LOGS, TREES, STUMPS, BRICK, CONCRETE, PIPING, ETC.) AS REQUIRED TO PERFORM THE WORK. SUCH MATERIALS SHALL BE CHARACTERIZED IN ACCORDANCE WITH THE WMP, DOWNSIZED (AS REQUIRED BY THE WASTE TRANSPORTATION AND DISPOSITION VENDORS), AND TRANSPORTED OFF–SITE TO AN APPROPRIATE, OWNER–APPROVED DISPOSAL FACILITY. CHARACTERIZATION REQUIREMENTS AND RESULTS SHALL BE SUBMITTED TO THE OWNER/DESIGN ENGINEER FOR REVIEW PRIOR TO TRANSPORTING NON–EARTHEN MATERIALS OFF–SITE FOR DISPOSAL.

13. SITE ACCESS SHALL BE FROM FOOD CENTER DRIVE. CONTRACTOR SHALL INSTALL NEW STABILIZED CONSTRUCTION ENTRANCE INTO PARCEL D AS SHOWN ON THE DESIGN DRAWINGS.

14. CONTRACTOR IS RESPONSIBLE TO MAINTAIN ACCESS TO ALL AREAS OF THE SITE DURING CONSTRUCTION.

15. CONSTRUCTION FENCING SHALL BE INSTALLED AROUND ACCESSIBLE PORTIONS OF ANY OPEN EXCAVATION.

16. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY TRAFFIC CONTROL MEASURES (E.G., FLAGGERS, SIGNS, CONES, ETC.) AND COORDINATING THE HAULING OF MATERIALS ON PUBLIC ROADWAYS. THE LOADING/UNLOADING OF MATERIALS AND EQUIPMENT WITHIN FOOD CENTER DRIVE IS PROHIBITED.

17. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING, COORDINATING, LOADING, AND TRANSPORTING EXCAVATED/REMOVED MATERIALS OFF–SITE FOR TREATMENT/DISPOSAL AT APPROPRIATE OWNER–APPROVED DISPOSAL FACILITIES.

18. THE CONTRACTOR SHALL PREVENT TRACKING OF SOIL MATERIALS ONTO OFF–SITE AREAS. ANY SOIL MATERIALS ACCIDENTALLY TRACKED OR OTHERWISE SPILLED OR DROPPED ONTO OFF–SITE AREAS SHALL BE IMMEDIATELY CLEANED UP BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

19. NO EXCAVATED MATERIALS OR SUPPLIES OF ANY KIND SHALL BE STORED ON PRIVATE OR PUBLIC PREMISES WITHOUT PRIOR APPROVAL FROM THE OWNER/OVERSIGHT ENGINEER.

20. ALL EQUIPMENT OPERATED WITHIN THE PROJECT CONSTRUCTION AREA (I.E., PROJECT WORK AREA AND AREA DESIGNATED FOR CONTRACTOR USE) SHALL BE DECONTAMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PRIOR TO ARRIVING ON–SITE AND PRIOR TO LEAVING THE PROJECT CONSTRUCTION AREA. PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS SHALL BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING IMPORTED BACKFILL MATERIAL.

21. EXISTING SITE FEATURES NOT SPECIFICALLY IDENTIFIED ON THE DESIGN DRAWINGS MAY REQUIRE REMOVAL BY THE CONTRACTOR TO FACILITATE CONSTRUCTION. THE REMOVAL OF SUCH FEATURES SHALL NOT BE PERFORMED WITHOUT PRIOR APPROVAL FROM THE OWNER/OVERSIGHT ENGINEER.

22. UPON COMPLETION OF CONSTRUCTION, THE WORK AREA SHALL BE LEFT IN A CLEAN, NEAT, AND ORDERLY CONDITION.

CITY: SYRACUSE_NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BAUSTERT LYR:ON=*;OFF=*REF*
G:\ENV\CADD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G01.DWG LAYOUT: 1 SAVED: 9/22/2014 3:38 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:26 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

No.	Date	Revisions	By	Ckd

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN	
Professional Engineer's No.	084067	
State	NY	Date Signed 9/15/14
Project Mgr.	MKH	
Designed by	MAD	Drawn by BGG
Checked by	JDB	

STATE OF NEW YORK · JASON D. BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

GENERAL NOTES AND ABBREVIATIONS

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0009\00020\DWG\CONTRACT43027G02.DWG LAYOUT: 2 SAVED: 11/21/2013 9:51 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES:
43027X00
43027X01

ON ED

27.52'

GAS TRANSMISSION EASEMENT TO IROQUOIS

FOOD CENTER DRIVE (NOT MAPPED)

FOOD CENTER DRIVE

CONCRETE SIDEWALK

CONCRETE SW

NOT IN USE

BRUSH / OVERGROWTH

PARCEL D

PURIFIER WASTE AREA (APPROXIMATE)

GATE

ASPHALT

ASPHALT PARKING LOT

ST l=6.11' 12" DIA RCP

ST 20" DIA RCP

ST l=3.16'

ST l=2.76' 20" DIA RCP

ST l=2.72' 12" DIA RCP

ST l=2.52'

ST 20" DIA RCP

EMPTY STEEL CONDUIT

CONCRETE THRUST BLOCK

15" DIA

12" DIA

RIP-RAP

CONCRETE LANDING PAD

ASPHALT PARKING LOT BELOW OVERHEAD STRUCTURE

CANOPY

CONCRETE SIDEWALK

CONCRETE PAD

CONCRETE SID

BRONX RIVER

EBB AND FLOW

LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- EXISTING RAILROAD TRACKS
- BUILDING
- TREE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- SANITARY SEWER LINE
- GAS LINE
- ELECTRIC LINE
- COMMUTER LINE
- OUTFALL
- CATCH BASIN
- MANHOLE
- LIGHT POLE
- HYDRANT
- VALVE
- BOLLARD
- STAND PIPE
- SIGN
- SURVEY CONTROL POINT
- CONCRETE LANDING PAD
- APPROXIMATE DRAINAGE AREA
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D

30' 0 30' 60'

1"=30'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 9/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK * JASON DAVID BRIEN * 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

EXISTING SITE CONDITIONS

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

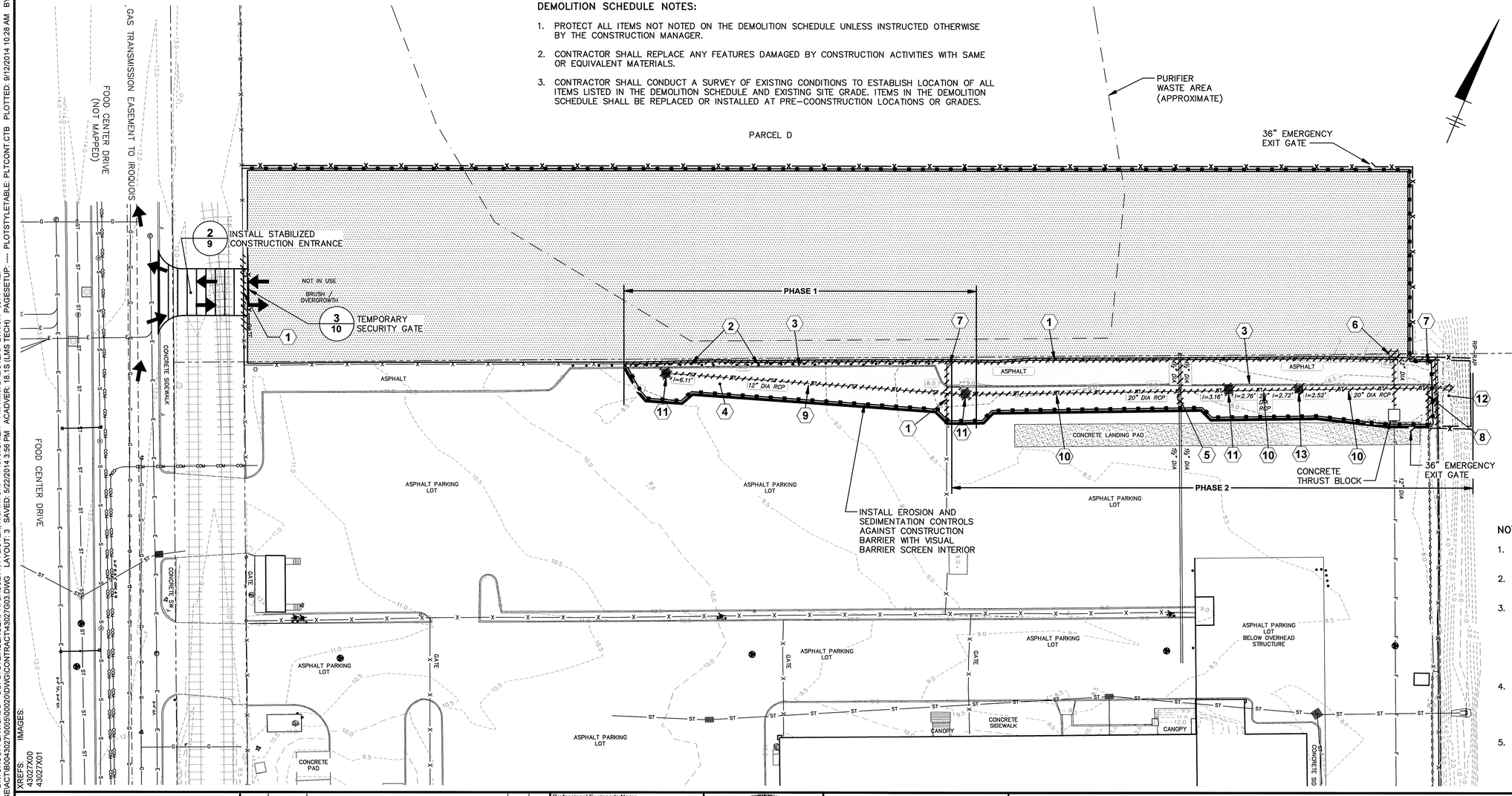
ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

DEMOLITION SCHEDULE		
NO.	ITEM	ACTION
1	CHAIN LINK FENCE WITH BARBED WIRE	REMOVE AS NECESSARY TO COMPLETE THE WORK. INSTALL NEW CHAIN LINK FENCE WITH BARBED WIRE AFTER WORK IS COMPLETE. REFER TO DETAIL ON DWG. 10. REMOUNT EXISTING SIGNAGE ON NEW FENCE.
2	BOLLARDS	REMOVE AS NECESSARY TO COMPLETE THE WORK. REINSTALL BOLLARDS IN CLASS 'B' CONCRETE AFTER WORK IS COMPLETE. (TYP.)
3	CONCRETE CURB	REMOVE, SAVE AND REUSE AS NECESSARY TO COMPLETE THE WORK.
4	ASPHALT	SAW CUT AND REMOVE AS NECESSARY TO COMPLETE THE WORK. FINAL SITE SHALL BE RE-PAVED. REFER TO DETAILS ON DWGS. 7 AND 8. PAINT PAVEMENT MARKINGS TO MATCH EXISTING.
5	(2) 1½"ø STEEL CONDUIT	REMOVE AS NECESSARY TO COMPLETE THE WORK. REPLACE IN KIND AFTER WORK IS COMPLETE.
6	FIRE SERVICE LINE	COORDINATE WITH OWNER TO TURN OFF SERVICE. DRAIN AS NECESSARY. REMOVE EXISTING THRUST BLOCK AND PIPING AS NECESSARY TO COMPLETE THE WORK. CAP PIPE AND INSTALL A 6' X 6' X 6' THRUST BLOCK AT NEW LOCATION. CAP SHALL BE A 12"ø MECHANICAL JOINT CAP WITH MECHANICAL JOINT RESTRAINT (EBAA SERIES 1100 MEGALUG OR APPROVED EQUAL).

DEMOLITION SCHEDULE		
NO.	ITEM	ACTION
7	LIGHT POST	REMOVE AS NECESSARY TO COMPLETE THE WORK. REPLACE AFTER WORK IS COMPLETE. REFER TO DETAIL ON DWG. 10.
8	GUARDRAIL	REMOVE AS NECESSARY TO COMPLETE THE WORK. INSTALL NEW GUARDRAIL IN CLASS 'B' CONCRETE AFTER WORK IS COMPLETE.
9	12"ø RCP	REMOVE AND REPLACE WITH NEW 12"ø HDPE PIPE. REFER TO PLAN AND PROFILE ON DWG. 6.
10	20"ø RCP	REMOVE AND REPLACE WITH NEW 20"ø HDPE PIPE. REFER TO PLAN AND PROFILE ON DWG. 6.
11	CATCH BASIN	REMOVE AND REPLACE WITH NEW HDPE CATCH BASIN. REFER TO PLAN AND PROFILE ON DWG. 6.
12	RIP-RAP	REMOVE AND REUSE AS NECESSARY TO COMPLETE THE WORK.
13	CATCH BASIN CB-120	REMOVE.

DEMOLITION SCHEDULE NOTES:

1. PROTECT ALL ITEMS NOT NOTED ON THE DEMOLITION SCHEDULE UNLESS INSTRUCTED OTHERWISE BY THE CONSTRUCTION MANAGER.
2. CONTRACTOR SHALL REPLACE ANY FEATURES DAMAGED BY CONSTRUCTION ACTIVITIES WITH SAME OR EQUIVALENT MATERIALS.
3. CONTRACTOR SHALL CONDUCT A SURVEY OF EXISTING CONDITIONS TO ESTABLISH LOCATION OF ALL ITEMS LISTED IN THE DEMOLITION SCHEDULE AND EXISTING SITE GRADE. ITEMS IN THE DEMOLITION SCHEDULE SHALL BE REPLACED OR INSTALLED AT PRE-COONSTRUCTION LOCATIONS OR GRADES.



LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- EXISTING RAILROAD TRACKS
- BUILDING
- TREE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- SANITARY SEWER LINE
- GAS LINE
- ELECTRIC LINE
- COMMUTER LINE
- OUTFALL
- CATCH BASIN
- MANHOLE
- LIGHT POLE
- HYDRANT
- VALVE
- BOLLARD
- STAND PIPE
- SIGN
- SURVEY CONTROL POINT
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D
- TEMPORARY SECURITY FENCE
- TEMPORARY SECURITY GATE (3/10)
- EROSION AND SEDIMENTATION CONTROLS (3/9)
- CONSTRUCTION BARRIER WITH VISUAL BARRIER SCREEN
- REMOVE/DEMOLISH
- AREA FOR CONTRACTOR USE (APPROXIMATELY 620' X 100') (SEE NOTES 3 AND 4) (5/9)
- PROJECT WORK AREA
- CONSTRUCTION VEHICLE ACCESS
- (1) DEMOLITION SCHEDULE CALLOUT

NOTES:

1. TEMPORARY LIGHTING SHALL BE USED AS REQUESTED BY OWNER OR OWNER'S REPRESENTATIVE.
2. PROJECT CONSTRUCTION AREA INCLUSIVE OF THE AREA FOR CONTRACTOR USE AND PROJECT WORK AREA
3. CONTRACTOR SHALL CLEAR AREA FOR CONTRACTOR USE (TO THE EXTENT NECESSARY TO PERFORM THE WORK), INSTALL PERIMETER EROSION AND SEDIMENTATION CONTROLS, AND IMPROVE GROUND SURFACE TO INSTALL THE SPECIFIED TEMPORARY FACILITIES (I.E., ACCESS ROADS, STAGING AREA, DECONTAMINATION AREA, OFFICE TRAILERS, ETC.) NECESSARY TO SUPPORT AND PERFORM THE CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL TEMPORARY SURFACE COVER SYSTEM OVER THE SELECTED LIMITS OF AREA FOR CONTRACTOR USE. SPECIAL PROVISIONS SHALL BE ACCOUNTED FOR TO PROMOTE CONTAINMENT FOR THE TEMPORARY WATER MANAGEMENT SYSTEM.
5. CONTRACTOR SHALL INSPECT THE INSTALLED TEMPORARY FACILITIES DAILY FOR CONFORMANCE WITH THE MINIMUM REQUIREMENTS PROVIDED IN THE DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE TEMPORARY FACILITIES AND IMPROVING AS NECESSARY.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM:J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\0020\DWG\CONTRACT\43027G03.DWG LAYOUT: 3 SAVED: 5/22/2014 3:56 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES:
43027X00
43027X01

1"=30' (30' 0 30' 60')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067

State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK * JASON DAVID BRIEN * LICENSED PROFESSIONAL ENGINEER * 084067

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

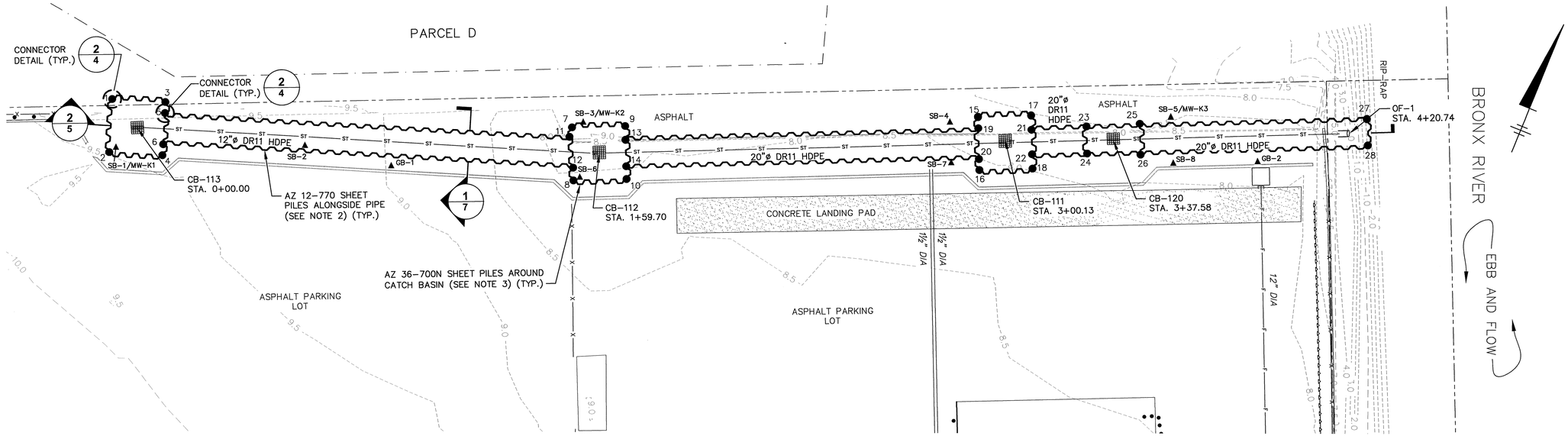
SITE PREPARATION PLAN

ARCADIS Project No.: B0043027.0005.00020

Date: SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

3



PLAN 1

0 20' 40'

SCALE: 1"=20'

LEGEND:

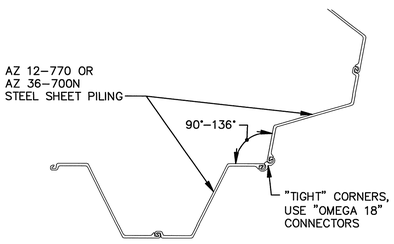
- PROPERTY LINE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- OUTFALL
- CATCH BASIN
- LIGHT POLE
- BOLLARD
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE
- SOIL BORING
- SURVEY CONTROL POINT
- CONSTRUCTION BARRIER WITH VISUAL BARRIER SCREEN
- STEEL SHEET PILING (SEE NOTES 2 AND 3)

EXCAVATION SUPPORT NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL NOTES AND DRAWING 2 FOR ADDITIONAL BASE MAP INFORMATION.
2. SHEET PILING CONSISTS OF MINIMUM 32 FEET LONG, GRADE 50, AZ 12-770 STEEL SHEET PILING, OR APPROVED EQUAL FOR PIPE EXCAVATION AND INSTALLATION OF COFFER DAM USED FOR DEWATERING OF THE RIVER.
3. SHEET PILING CONSISTS OF MINIMUM 37.5 FEET LONG, GRADE 50, AZ 36-700N STEEL SHEET PILING, OR APPROVED EQUAL FOR CATCH BASIN EXCAVATION AND INSTALLATION. SHEET PILES SHALL BE INSTALLED TO THE DEPTHS AND LIMITS AS INDICATED ON THE TECHNICAL SPECIFICATIONS.
4. IF MINIMUM SHEET PILE LENGTHS ARE USED, PLACE SANDBAGS ALONGSIDE EXCAVATION TO PREVENT STORMWATER FROM ENTERING TRENCH FOR A MINIMUM OF 6" HIGH.
5. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
6. TEMPORARY LOADING OR STOCKPILING OF SOILS MAY BE PERMITTED WITHIN 25 FEET OF THE SHEET PILE ALIGNMENT DURING EXCAVATION AND BACKFILLING ACTIVITIES ASSOCIATED WITH INSTALLATION OF THE NEW HDPE PIPE. LOADING OR STOCKPILING ACTIVITIES SHALL BE LIMITED TO A PERIOD OF NOT MORE THAN ONE HOUR.
7. LOCATIONS, SIZES, DEPTHS, AND MATERIALS ASSOCIATED WITH SUBSURFACE PIPING CAN BE FOUND ON DWG. 2, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
8. LIMITS OF EXCAVATION SHALL BE ESTABLISHED A MINIMUM OF 2-FOOT AROUND AND BELOW CATCH BASINS AND HDPE PIPE TO BE INSTALLED.
9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING EXCAVATION SUPPORT IN ACCORDANCE WITH THE DESIGN DRAWINGS AND TECHNICAL SPECIFICATIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SAFE AND ADEQUATE VEHICLE/EQUIPMENT ACCESS AND EGRESS TO THE EXCAVATION AREA TO FACILITATE THE EXCAVATION OF MATERIALS TO THE HORIZONTAL AND VERTICAL LIMITS IDENTIFIED ON THIS DRAWING OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
11. ALL WATER THAT ENTERS THE EXCAVATION LIMITS SHALL BE COLLECTED VIA THE PRE-TREATMENT SYSTEM (I.E., BAG FILTERS) AND CONTAINERIZED FOR OFFSITE DISPOSAL.
12. EXCAVATION SUPPORT MATERIALS TO BE DECONTAMINATED TO THE SATISFACTION OF CONSTRUCTION MANAGER PRIOR TO REMOVAL FROM SITE.
13. VERTICAL SCALE REPRESENTS ELEVATIONS IN FEET IN BRONX HIGHWAY DATUM.
14. HORIZONTAL SCALE ON PROFILE REPRESENTS STATIONING IN FEET.

SURVEY CONTROL POINTS		
POINT NO.	NORTHING	EASTING
1	720498.2553	666112.8229
2	720480.8873	666118.8174
3	720504.2497	666130.1908
4	720486.8818	666136.1853
5	720500.6670	666131.4883
6	720490.5021	666134.9967
7	720549.5357	666263.3361
8	720532.7254	666270.7517
9	720556.9513	666280.1465
10	720540.1410	666287.5621
11	720546.1413	666263.7741
12	720536.7454	666268.9784
13	720552.5473	666282.0892
14	720544.1899	666285.7759

SURVEY CONTROL POINTS		
POINT NO.	NORTHING	EASTING
15	720606.2124	666391.8152
16	720589.4021	666399.2309
17	720613.6280	666408.6256
18	720596.8177	666416.0412
19	720602.6238	666393.3983
20	720592.8647	666397.6404
21	720609.1113	666410.6180
22	720601.3344	666414.0487
23	720617.3792	666427.7739
24	720608.7858	666431.5647
25	720625.2631	666444.4407
26	720615.4245	666448.7807
27	720656.4620	666516.4077
28	720648.1508	666520.1759



CONNECTOR DETAIL 2

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\0020\DWG\CONTRACT\43027G04.DWG LAYOUT: 4 SAVED: 4/10/2014 4:20 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:29 AM BY: GETTS, BRIAN
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067

State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by: APC	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

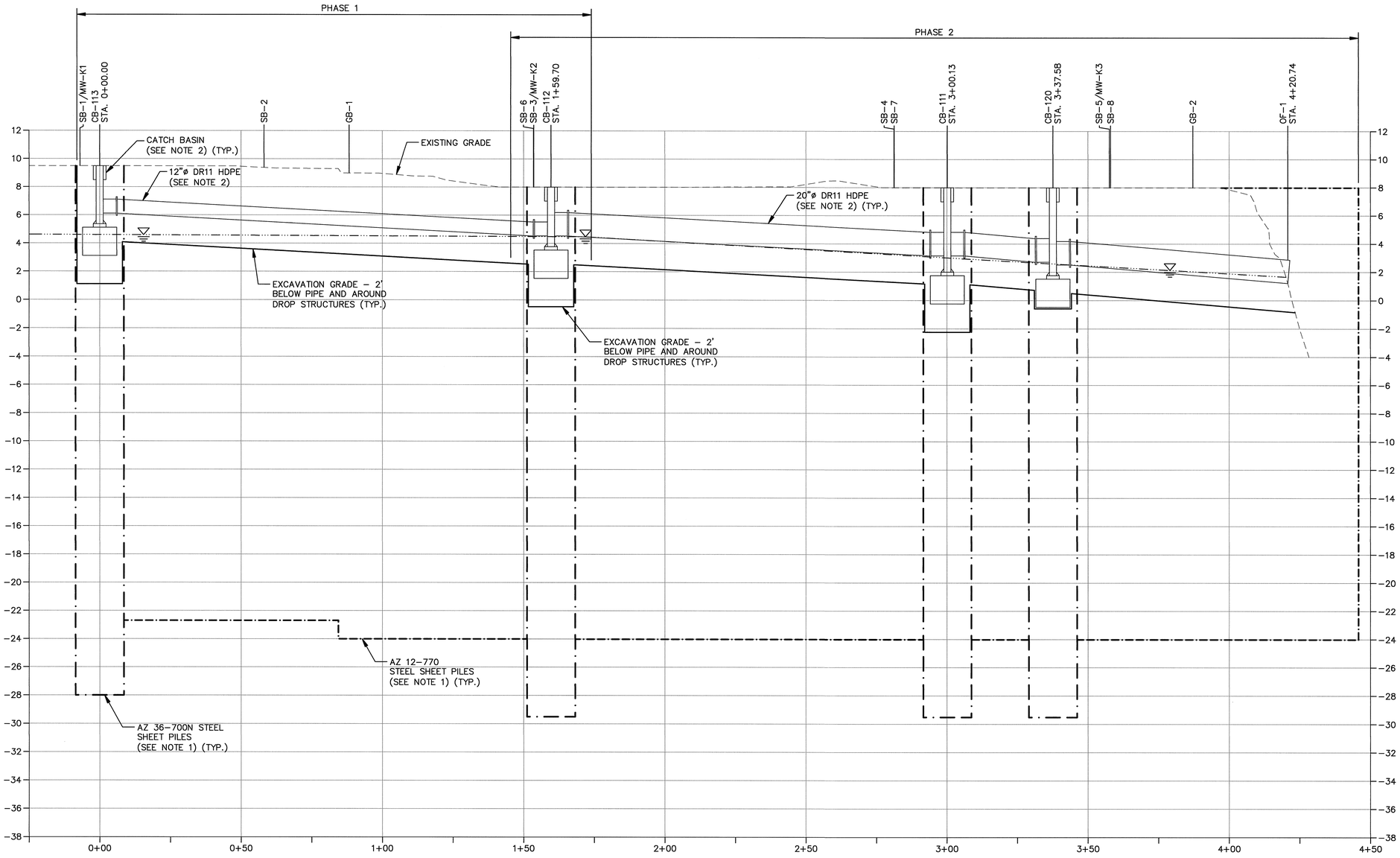
EXCAVATION SUPPORT PLAN

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

4



EXCAVATION SUPPORT PROFILE 2

0 20' 40'
HORIZONTAL SCALE: 1"=20'
0 4' 8'
VERTICAL SCALE: 1"=4'

NOTES:

1. SHEET PILING CONSISTS OF MINIMUM 32 FEET LONG, GRADE 50, AZ 12–770 STEEL SHEET PILING, OR APPROVED EQUAL FOR PIPE EXCAVATION AND INSTALLATION OF COFFER DAM USED FOR DEWATERING OF THE RIVER.
2. SHEET PILING CONSISTS OF MINIMUM 37.5 FEET LONG, GRADE 50, AZ 36–700N STEEL SHEET PILING, OR APPROVED EQUAL FOR CATCH BASIN EXCAVATION AND INSTALLATION. SHEET PILES SHALL BE INSTALLED TO THE DEPTHS AND LIMITS AS INDICATED ON THE TECHNICAL SPECIFICATIONS.
3. REFER TO DWGS. 6 AND 7 FOR ADDITIONAL STORM SEWER INFORMATION.
4. SOIL BORING INFORMATION CAN BE FOUND IN THE 2013 PRE–DESIGN INVESTIGATION REPORT.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G04.DWG LAYOUT: 5 SAVED: 4/10/2014 4:20 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INCHES

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067
State: NY | Date Signed: 9/15/14 | Project Mgr.: MKH
Designed by: APC | Drawn by: BGG | Checked by: JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK
STORM SEWER REPLACEMENT

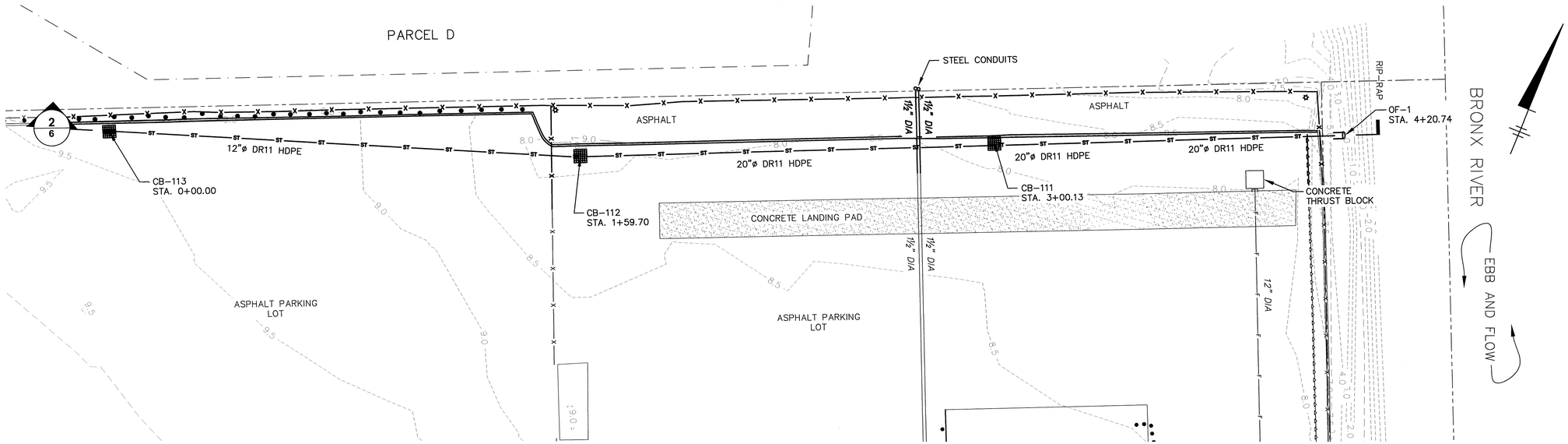
EXCAVATION SUPPORT PROFILE

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

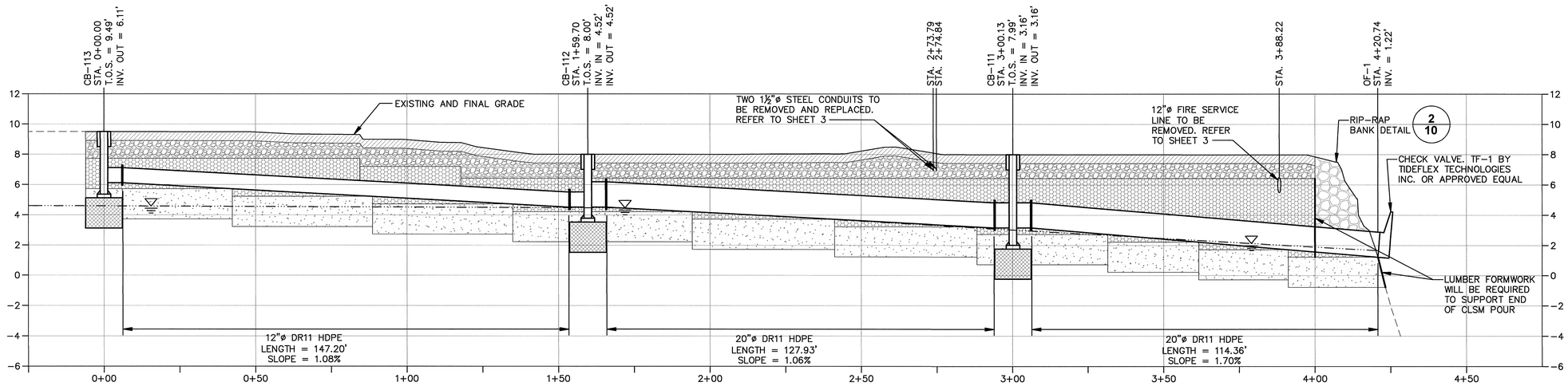
5



PLAN 1

0 20' 40'

SCALE: 1"=20'



STORM SEWER PROFILE 2

0 20' 40'

HORIZONTAL SCALE: 1"=20'

0 4' 8'

VERTICAL SCALE: 1"=4'

LEGEND:

- PROPERTY LINE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- OUTFALL
- CATCH BASIN
- LIGHT POLE
- BOLLARD
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D
- CLSM A (PROFILE ONLY)
- CLSM B (PROFILE ONLY)
- CLSM C (PROFILE ONLY)
- TYPE "F" RUN OF CRUSHER STONE (PROFILE ONLY)
- RIP RAP (PROFILE ONLY)
- ASPHALT (PROFILE ONLY)

NOTES:

1. REFER TO CLSM SCHEDULE ON DWG. 7 FOR NOTES ON CLSM INSTALLATION.
2. NEW AND RESTORED FEATURES SHOWN IN BOLD.
3. CLSM TO BE INSTALLED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF* G:\ENV\CAD\SYRACUSE\ACTIVE\B0043027\0005\0020\DWG\CONTRACT\43027G06.DWG LAYOUT: 6 SAVED: 4/10/2014 2:39 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:30 AM BY: GETTS, BRIAN
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN
Professional Engineer's No.	084067
State	NY
Date Signed	9/15/14
Project Mgr.	MKH
Designed by	MAD
Drawn by	BGG
Checked by	JDB

STATE OF NEW YORK * JASON DAVID BRIEN * 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

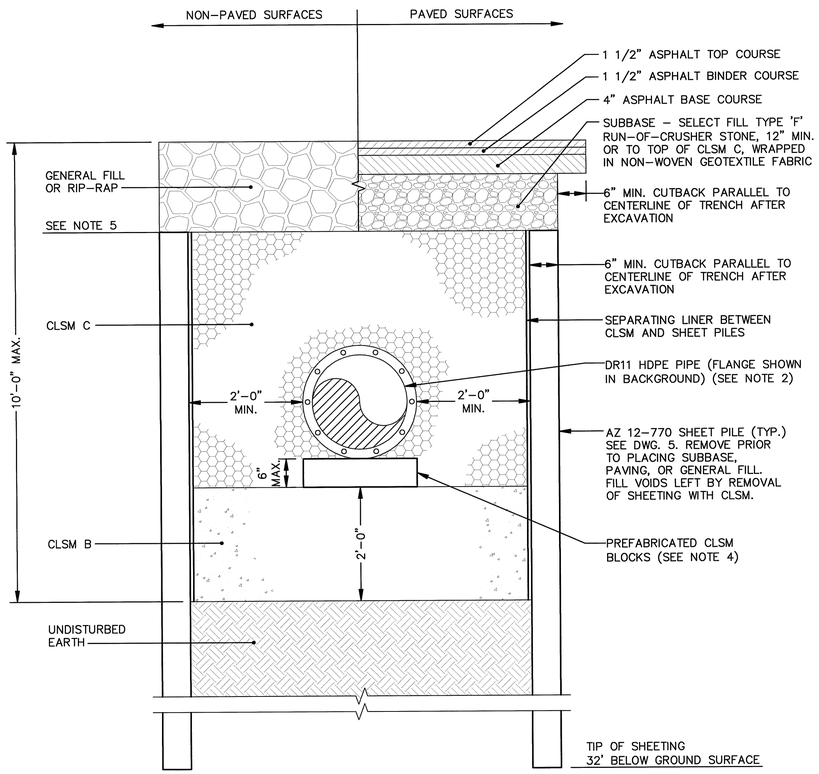
STORM SEWER PLAN AND PROFILE

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

6



CLSM SCHEDULE		
NAME	NOTES	DEPTH
CLSM A	1. POUR CLSM A BEFORE PLACING HDPE CATCH BASIN STRUCTURE. 2. CLSM A SHALL BE CURED 24 HOURS PRIOR TO PLACING OF CATCH BASIN.	BOTTOM OF CLSM A SHALL BE TWO FEET BELOW BOTTOM OF CATCH BASIN.
CLSM B	1. POUR CLSM B AFTER PLACING HDPE CATCH BASIN. 2. POUR CLSM B BEFORE PLACING HDPE PIPING.	TOP OF CLSM B SHALL BE TO THE BOTTOM OF THE LOWEST PIPE FLANGE IN POUR OR TO A MAXIMUM OF 6" BENEATH PIPE. DEPTH OF CLSM B SHALL BE TWO FEET.
CLSM C	1. POUR CLSM C AFTER PLACING HDPE PIPING AND LEAKAGE TESTING IS APPROVED. 2. WATER USED IN LEAK TESTING SHALL BE KEPT IN SYSTEM UNTIL AFTER CLSM C IS POURED.	TOP OF CLSM C SHALL BE TWO FEET ABOVE TOP OF PIPE AT HIGHEST ELEVATION IN POUR OR AS SHOWN IN STORM SEWER PLAN AND PROFILE ON DWG. 6.

NOTES:

1. PLACE ONE COAT OF ASPHALT TACK COAT BETWEEN EACH LAYER OF ASPHALT. ASPHALT TACK COAT SHALL BE DURAFILL D3405 OR EQUAL.
2. REMOVE CLSM B AROUND FLANGE AS REQUIRED TO PROPERLY INSTALL FLANGE.
3. PRIOR TO PLACING CLSM C, TEMPORARILY PLUG HDPE PIPE AND FILL PIPE WITH WATER. AFTER CLSM IS SET, REMOVE PLUG AND DISPOSE OF WATER.
4. CONTRACTOR SHALL PLACE PREFABRICATED CLSM BLOCKS FOR PIPE SUPPORT. BLOCKS SHALL HAVE MAXIMUM DIMENSIONS OF 6" X 6" X 24", BUT SHALL BE ADJUSTED TO FIT SITE AND PIPING CONDITIONS. SUPPORT SPACING SHALL BE DETERMINED BY MANUFACTURER.
5. REMOVE TEMPORARY EXCAVATION SUPPORT PRIOR TO INSTALLATION OF ALL FILL ABOVE CLSM C, INCLUDING GENERAL FILL, RIP-RAP, SELECT FILL, AND ASPHALT COURSES.
6. CLSM TO BE INSTALLED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

LEGEND:

- CLSM B
- CLSM C
- TYPE "F" RUN OF CRUSHER STONE
- RIP-RAP

TRENCH DETAIL 1

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVE\B0043027\0005\00020\DWG\CONTRACT\43027G07.DWG LAYOUT: 7 SAVED: 4/10/2014 1:41 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:30 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name		
JASON D. BRIEN		
Professional Engineer's No.		
084067		
State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by	Drawn by	Checked by
MAD	BGG	JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

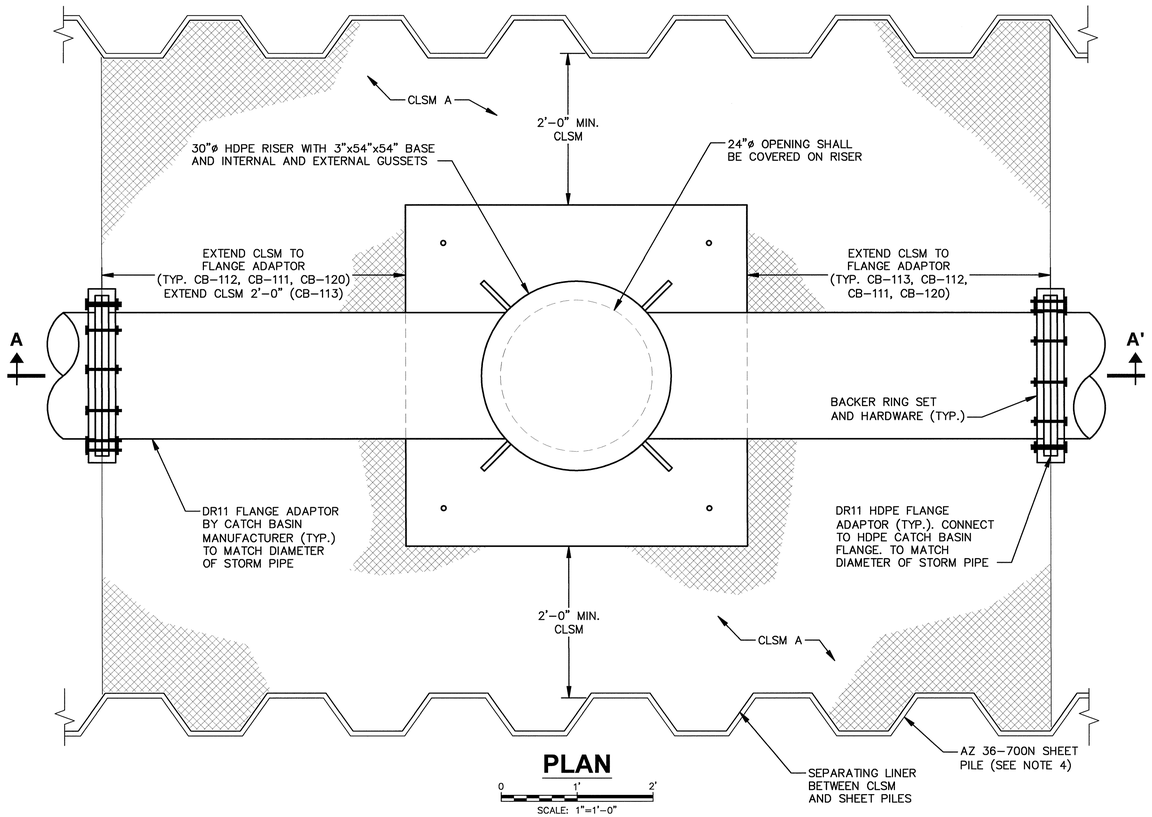
STORM SEWER REPLACEMENT

PIPING AND TRENCH DETAILS

ARCADIS Project No.
B0043027.0005.00020

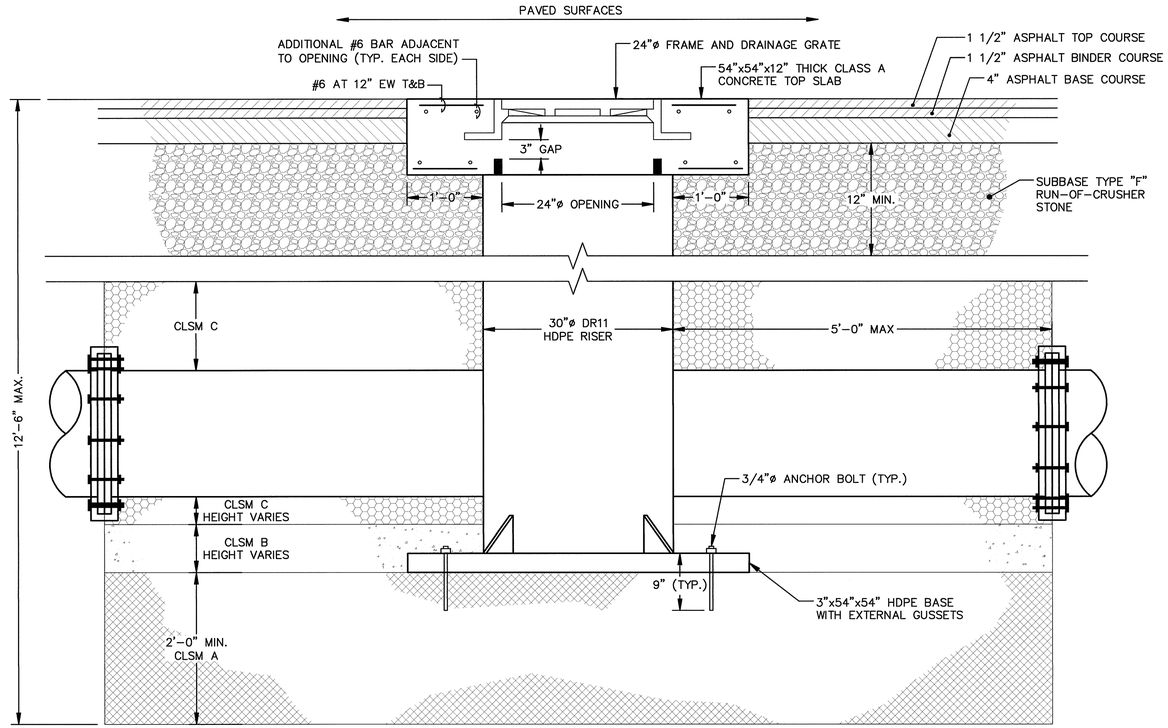
Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120



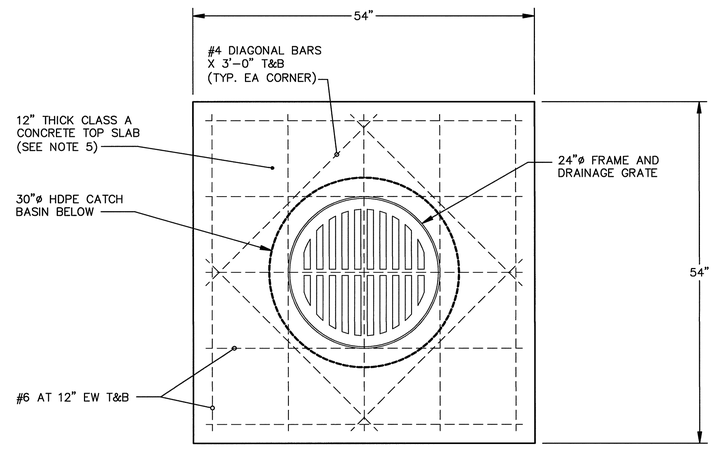
PLAN

SCALE: 1"=1'-0"



SECTION A-A'

SCALE: 1"=1'-0"



TOP SLAB PLAN

SCALE: 1"=1'-0"

NOTES:

1. REFER TO CLSM SCHEDULE ON DWG. 7 FOR NOTES ON CLSM INSTALLATION.
2. CB-113 ONLY REQUIRES ONE FLANGE ADAPTOR. TWO FLANGE ADAPTORS ARE SHOWN TO REPRESENT TYPICAL CATCH BASIN PLAN.
3. PLAN MAY NOT REPRESENT REQUIRED ALIGNMENT OF FLANGE ADAPTORS. ANGLES OF EACH FLANGE ADAPTOR SHALL BE SET FOR EACH CATCH BASIN.
4. TIP OF SHEETING 37.5 FEET BELOW GROUND SURFACE.
5. CONTRACTOR TO SLOPE CONCRETE TOP SLAB, ALL DIRECTIONS, TOWARD CATCH BASIN.
6. CLSM TO BE INSTALLED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.

LEGEND:

- CLSM A
- CLSM B
- CLSM C
- TYPE "F" RUN OF CRUSHER STONE
- RIP-RAP
- ASPHALT

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: G.STEINBERGER R.BASSETT LD: G.STEINBERGER PIC: K.WHITE PM: M.CARRILLO-SHERIDAN TM: D.CORNELL LYR:ON="OFF="REF"
G:\ENVCAD\SYRACUSE\ACTIB\0043027\0005\00020\DWG\CONTRACT\43027G08.DWG LAYOUT: 8 SAVED: 4/10/2014 11:23 AM ACADVER: 18.1S (LMS TECH) PAGESETUP:--- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:31 AM BY: GETTS, BRIAN
XREFS: IMAGES:
43027X00

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN		
Professional Engineer's No.	084067		
State	Date Signed	Project Mgr.	
NY	9/15/14	MKH	
Designed by	Drawn by	Checked by	
MAD	BGG	JDB	

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

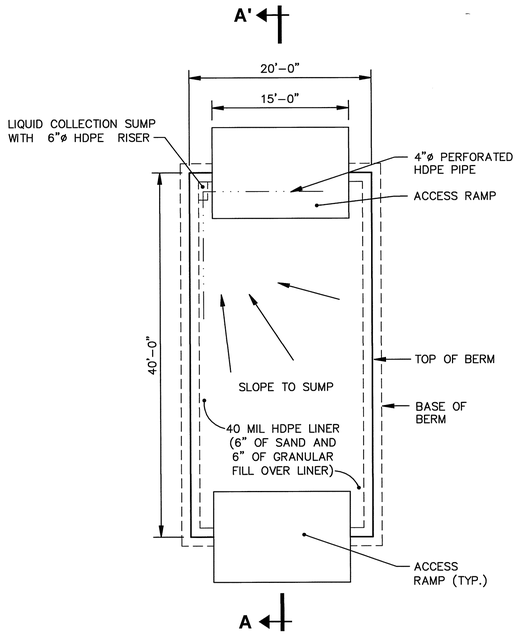
STORM SEWER REPLACEMENT

TYPICAL HDPE CATCH BASIN DETAILS

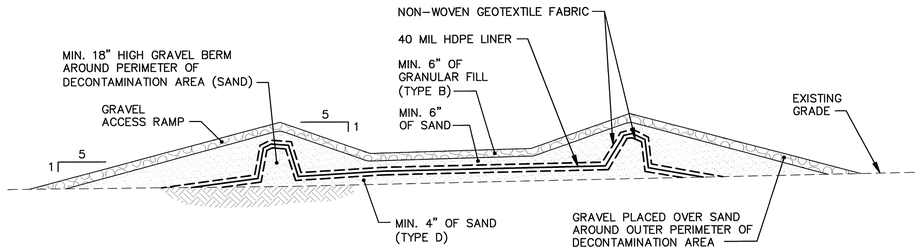
ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120



PLAN



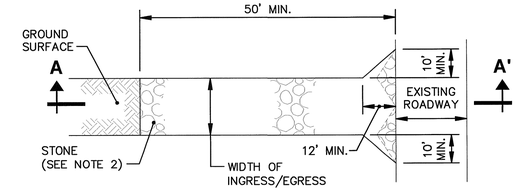
SECTION A-A'

NOTES:

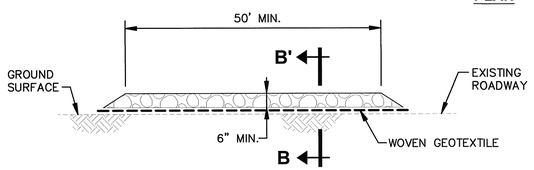
1. DECONTAMINATION AREA SHALL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS SHALL BE PUMPED FROM COLLECTION SUMP INTO 55 GALLON DRUMS OR A TEMPORARY STORAGE TANK (IF NECESSARY).
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE DECONTAMINATION AREA, INCLUDING HDPE LINER AND GEOTEXTILE FABRIC, IS TO BE REMOVED BY THE CONTRACTOR FOR DISPOSAL.

DECONTAMINATION AREA 1

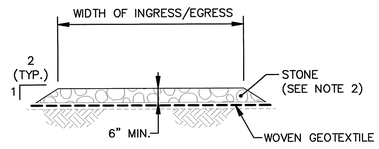
NOT TO SCALE



PLAN



SECTION A-A'



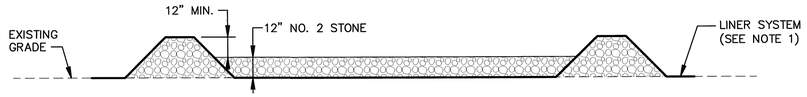
SECTION B-B'

NOTES:

1. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL SITE INGRESS/EGRESS LOCATIONS.
2. STONE SHALL BE A MIX OF 1–INCH TO 4–INCH DIAMETER STONE.

STABILIZED CONSTRUCTION ENTRANCE 2

NOT TO SCALE

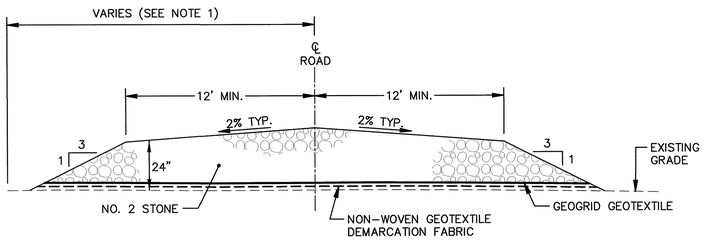


NOTE:

1. PLACE LINER SYSTEM (CONSISTING OF A NON–WOVEN GEOTEXTILE FABRIC, 40 MIL HDPE LINER, AND NON–WOVEN GEOTEXTILE FABRIC) OVER THE EXISTING SURFACE.

WATER MANAGEMENT SYSTEM CONTAINMENT AREA 6

NOT TO SCALE

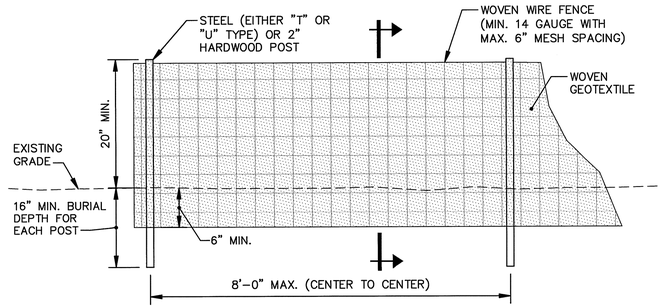


NOTES:

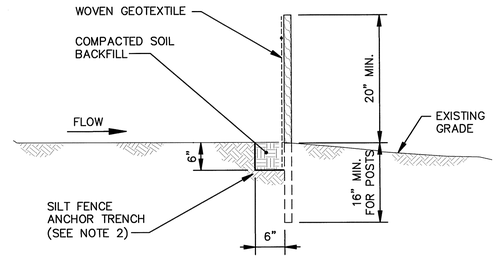
1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES, TOPOGRAPHY, AND PLANNED EQUIPMENT USE.
2. PLACEMENT OF FILL FOR ACCESS ROADS SHALL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.

ACCESS ROAD TYPICAL SECTION 4

NOT TO SCALE



PROFILE



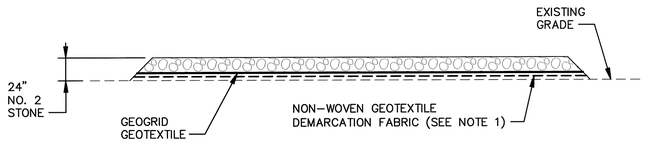
SECTION

NOTES:

1. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE OR AS DIRECTED BY CONSTRUCTION MANAGER.
2. THE SILT FENCE SHALL BE FOLDED INTO A TRENCH AND BACKFILLED.
3. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENTATION CONTROL.

REINFORCED SILT FENCE 3

NOT TO SCALE



NOTES:

1. NON–WOVEN GEOTEXTILE DEMARCATION FABRIC SHALL BE PLACED OVER THE EXISTING GROUND SURFACE.
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY SURFACE COVER SYSTEM, INCLUDING NON–WOVEN GEOTEXTILE DEMARCATION FABRIC, SHALL BE REMOVED FOR OFFSITE DISPOSAL AT AN APPROVED AND LICENSED FACILITY.

TEMPORARY SURFACE COVER SYSTEM 5

NOT TO SCALE

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS, K.SARTORI PIC: J.BRIEN PM: TM: J.BALISTERI LYR:ON=*;OFF=*REF* G:\ENV\CAD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G09.DWG LAYOUT: 9 SAVED: 5/22/2014 4:03 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:31 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 7/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK
STORM SEWER REPLACEMENT

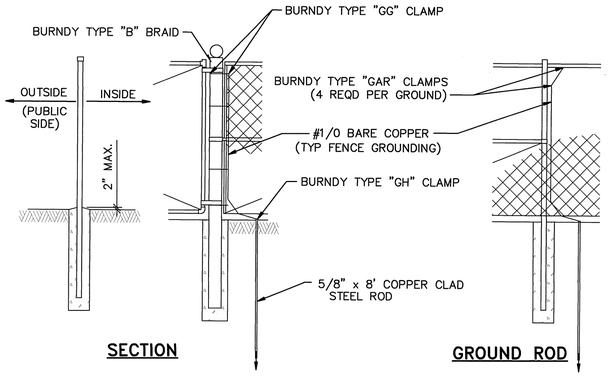
TYPICAL DETAILS

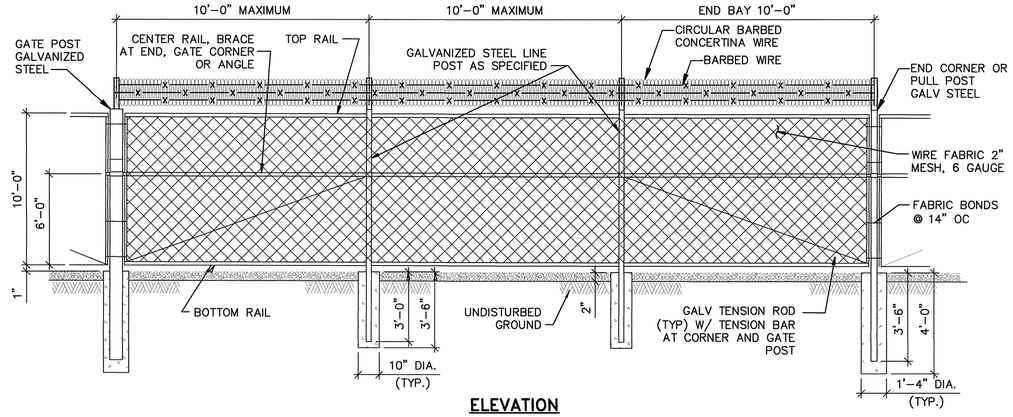
ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

9





ELEVATION

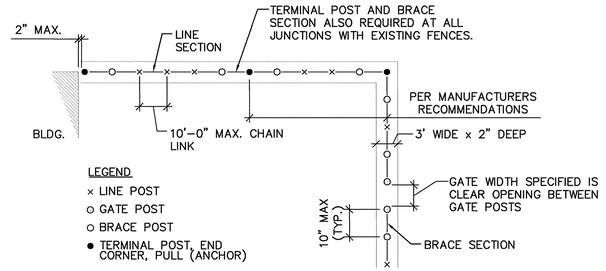
NOTES:

1. DIMENSIONS:
   ALL DIMENSIONS, SIZES GAUGES, WEIGHTS OR THICKNESSES SHOWN ARE THE MINIMUM ACCEPTABLE, UNLESS OTHERWISE INDICATED.

2. GROUND RODS, CHAIN LINK FENCE AND GATES ONLY: GROUND RODS SHALL BE INSTALLED AT 400' MAXIMUM INTERVALS, INCIDENTAL TO FENCE COST. EACH SECTION OF FENCE SEPARATED BY NON-METALLIC CONNECTORS, BUILDINGS OR OTHER OPENINGS SHALL HAVE A MINIMUM OF ONE GROUND ROD. EACH GATE LEAF FRAME SHALL BE CONNECTED TO THE GATE POST BY A BRAIDED FLEXIBLE COPPER STRAP. EACH GATE POST SHALL BE GROUNDED AS DETAILED. GROUND RODS SHALL BE 5/8"x8' MIN. SIZE, COPPER OR COPPER CLAD GROUND CABLE SHALL BE NO. 6 AWG. MIN. BARE STRANDED COPPER WIRE. FOR FENCES GROUNDING SHALL BE AS DETAILED. CONNECTIONS TO FENCE AND RODS SHALL BE MADE WITH SUITABLE NON-CORROSIVE METAL CLAMPS, LUGS OR CONNECTORS.

3. FENCE LINE AND ALIGNMENT:
   THE FENCE SHALL BE CONSTRUCTED VERTICAL, STRAIGHT AND TRUE TO THE LINE, THE LONGITUDINAL GRADIENT SHALL PARALLEL THE GENERAL SLOPE OF THE GROUND.

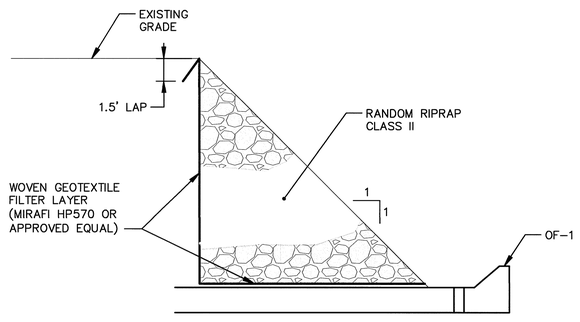
4. TEMPORARY SITE SECURITY FENCE POSTS WILL BE INSTALLED USING NON-INTRUSIVE METHODS (E.G., ANCHORED IN PRECAST CONCRETE BLOCKS OR PANEL STANDS) AND WILL NOT INCLUDE DRIVING POSTS INTO THE GROUND AND/OR SETTING POSTS INTO HOLES AND BACKFILLING THE HOLES.



TYPICAL FENCE LAYOUT

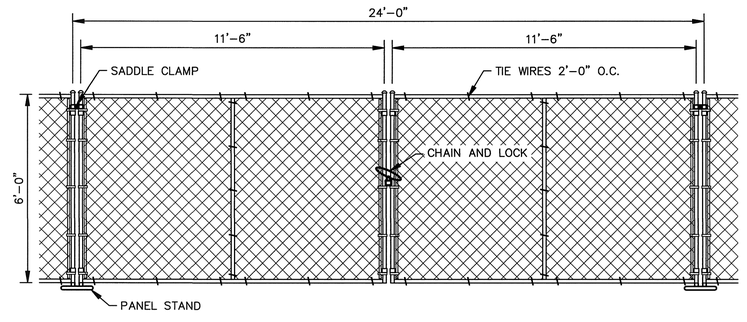
PERMANENT CHAIN LINK FENCE DETAIL 1

NOT TO SCALE



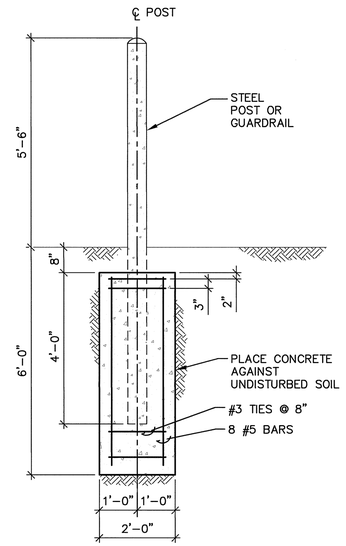
RIPRAP BANK DETAIL 2

NOT TO SCALE



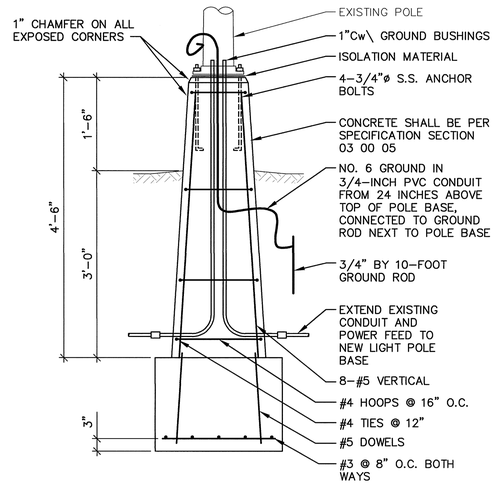
TEMPORARY ACCESS GATE 3

NOT TO SCALE



STEEL POST AND GUARDRAIL BASE DETAIL 4

NOT TO SCALE



EXTERIOR LIGHT POLE BASE DETAIL 5

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCADD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\430270X10.DWG LAYOUT: 10 SAVED: 9/13/2014 8:14 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:32 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
430027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 9/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

RESTORATION DETAILS

ARCADIS Project No.	B0043027.0005.00020
Date	SEPTEMBER 2014

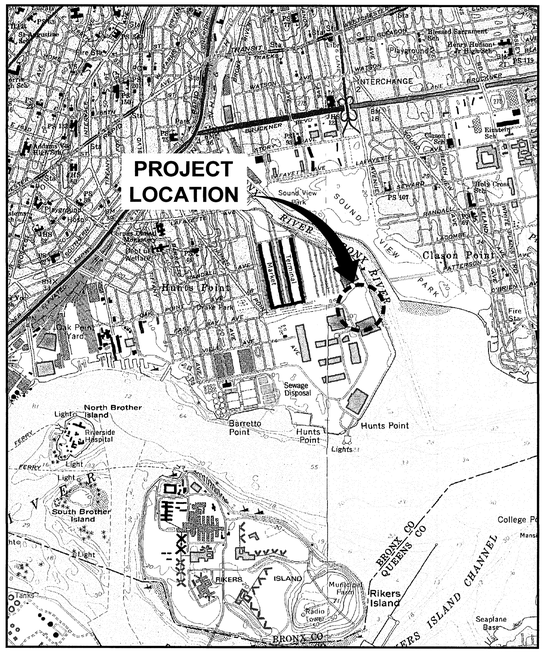
ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

10

DESIGN DRAWINGS

STORM SEWER REPLACEMENT

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MGP SITE
KRASDALE LEASEHOLD
BRONX, NEW YORK



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., CENTRAL PARK AND FLUSHING, NY., 1966. PHOTOREVISED 1979.

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE

DATE ISSUED

SEPTEMBER 2014

ARCADIS

ARCADIS OF NEW YORK, INC.

KEY CONTACTS:

OWNER:
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
31-01 20TH AVENUE, BUILDING 136
LONG ISLAND CITY, NY 11105
TELEPHONE: 718.204.4205
CONTACT: YELENA SKOROBOGATOV

ENGINEER:
ARCADIS OF NEW YORK, INC.
6723 TOWPATH RD.
BOX 66
SYRACUSE, NY 13214
TELEPHONE: 315.446.9120
CONTACT: JASON D. BRIEN

INDEX TO DRAWINGS

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS, K.SARTORI PIC: J BRIEN PM: TM:J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIB0043027\0005\00020\DWG\CONTRACT43027Q01.dwg LAYOUT: COVER SAVED: 9/11/2014 3:52 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:22 AM BY: GETTS, BRIAN
XREFS: IMAGES:
43027X01.tiff
43027X02.tiff

GENERAL NOTES:

1. BASE MAP PROVIDED BY NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION (NYC EDC) SELECT HISTORICAL FEATURES NOT SHOWN FOR CLARITY.

2. NORTH ARROW, BEARINGS, AND COORDINATES BASED ON THE NORTH AMERICAN DATUM OF 1983 (1996 ADJUSTMENT). THE PROJECTION IS NEW YORK – EAST (3101)/NEW JERSEY (2900). GEOID03 WAS USED TO DETERMINE SEPARATION BETWEEN ELLIPSOID HEIGHT AND ORTHOMETRIC HEIGHT.

3. PROJECT CONTROL WAS DETERMINED USING LEICA DUAL–FREQUENCY GPS RECEIVERS. THE REFERENCE MONUMENTS WERE NJI2 (PID #AJ3348) AND LAMT (PID #AJ4872).

4. THE VERTICAL DATUM IS BRONX HIGHWAY DATUM.

5. ALL UNITS SHOWN ON THIS MAP ARE US STANDARD SURVEY FEET.

6. MERCATOR LAND SURVEYING, LLC OF NEW YORK, NEW YORK PREPARED THIS SURVEY BASED UPON THE TITLE REPORTS PREPARED BY OTHERS AND RESEARCH CONDUCTED BY MERCATOR LAND SURVEYING.

7. THE PROPERTY IN QUESTION (PIQ) IS LOCATED IN FLOOD HAZARD ZONE AE (BASE FLOOD ELEVATION 14 & 15 – NGVD29) AND IN FLOOD HAZARD ZONE VE (COASTAL FLOOD ZONE WITH WAVE ACTION) AND IN FLOOD HAZARD ZONE X AS DEPICTED ON FIRM COMMUNITY PANEL NO. 360497 0111F DATED: SEPTEMBER 5, 2007.

8. INFORMATION RELATED TO SUBSURFACE CONDITIONS SHOULD BE CONSIDERED AS GENERALLY REPRESENTATIVE AND SHOULD NOT BE RELIED UPON AS A COMPLETE DEPICTION OF SITE CONDITIONS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INCLUDING ABOVE–GRADE AND SUBSURFACE FEATURES WHETHER OR NOT SHOWN ON DESIGN DRAWINGS OR OTHERWISE DESCRIBED IN THE CONTRACT DOCUMENTS. FAILURE TO VERIFY ALL EXISTING SITE CONDITIONS SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL COMPENSATION.

9. ALL LOCATIONS, INCLUDING PROPERTY LINES, ARE APPROXIMATE, REFLECT AVAILABLE INFORMATION, ARE PROVIDED FOR REFERENCE ONLY, AND ARE SUBJECT TO FIELD VERIFICATION BY THE CONTRACTOR. EASEMENTS AND RIGHTS–OF–WAY ARE NOT SHOWN.

10. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER AND THE OVERSIGHT ENGINEER, UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE WHICH DIFFER MATERIALLY FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS.

11. THE CONTRACTOR SHALL PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE OVERSIGHT ENGINEER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.

12. THE CONTRACTOR SHALL OBTAIN ALL FEDERAL, STATE, AND LOCAL PERMITS REQUIRED TO COMPLETE THE WORK UNLESS EXPLICITLY STATED OTHERWISE IN THE CONTRACT DOCUMENTS.

13. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS.

14. CONTRACTOR TO SIZE THE TEMPORARY FACILITIES AREA APPROPRIATELY TO SUPPORT THE CONSTRUCTION ACTIVITIES.

15. THE TECHNICAL WORK IS DESCRIBED IN SEVERAL DOCUMENTS THAT COLLECTIVELY REPRESENT THE REMEDIAL DESIGN. THESE DOCUMENTS INCLUDE THE DESIGN DRAWINGS, TECHNICAL SPECIFICATIONS, CAMP, CQAP, CSMP, AND WMP. THESE DOCUMENTS SHALL BE THOROUGHLY REVIEWED BY THE CONTRACTOR. ANY DIFFERENCES IDENTIFIED BY THE CONTRACTOR BETWEEN THE INFORMATION PRESENTED IN THE ABOVE–LISTED DOCUMENTS SHALL BE SUBMITTED TO THE DESIGN ENGINEER (IN WRITING) FOR CLARIFICATION.

ABBREVIATIONS:

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AMSL	ABOVE MEAN SEA LEVEL
BGS	BELOW GROUND SURFACE
CAMP	COMMUNITY AIR MONITORING PLAN
CB	CATCH BASIN
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CONT.	CONTINUOUS
CQAP	CONSTRUCTION QUALITY ASSURANCE PLAN
CSMP	CONSTRUCTION SITE MANAGEMENT PLAN
ø OR DIA	DIAMETER
DR OR SDR	(STANDARD) DIMENSIONAL RATIO
DWG.	DRAWING
EF	EACH FACE
EW	EACH WAY
EL.	ELEVATION
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
FL	FLANGED
FT OR '	FOOT
GPM	GALLONS PER MINUTE
HASP	HEALTH AND SAFETY PLAN
HDPE	HIGH DENSITY POLYETHYLENE
IN OR "	INCH
INV.	INVERT
MH	MANHOLE
MAX.	MAXIMUM
MGP	MANUFACTURED GAS PLANT
MIN.	MINIMUM
MIL	ONE THOUSANDTH OF AN INCH
OF	OUTFALL
PE	PLAIN END
PSI	POUNDS PER SQUARE INCH
RCP	REINFORCED CONCRETE PIPE
S	SLOPE
S.S.	STAINLESS STEEL
STA.	STATION
T&B	TOP AND BOTTOM
T.O.S.	TOP OF STRUCTURE
TYP.	TYPICAL
WMP	WASTE MANAGEMENT PLAN

SAFETY NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS IN CONNECTION WITH THE PROJECT. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT SITE WORKERS, CONSTRUCTION OVERSIGHT PERSONNEL, AND SITE VISITORS.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91–596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91–54) AND AMENDMENTS THERETO. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910 AND 29 CFR 1926. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.

3. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL EXCAVATION SHORING/BRACING, SCAFFOLDING, SHIELDING, DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, PROPER WORKING EQUIPMENT WITH FUNCTIONING SAFETY MECHANISMS (E.G., LIFT GATE WARNING SIGNALS), ALL SITE SAFETY SIGNAGE, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS TO SECURE SUCH PROTECTION.

4. THE MATERIALS SUBJECT TO HANDLING AS PART OF THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS, AND SITE VISITORS, AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY. THE CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL BE DEVELOPED IN ACCORDANCE WITH APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS.

5. SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED WITHIN, ADJACENT TO, OR IN THE VICINITY OF THE EXCAVATION/BACKFILL AREAS. THE CONTRACTOR'S HEALTH AND SAFETY PLAN SHALL RECOGNIZE THE TYPES OF ACTIVITIES TO BE PERFORMED, THE UNIQUE HAZARDS SPECIFIC TO THESE ACTIVITIES, AND SPECIAL PRECAUTIONS AND CONTROLS THAT ARE TO BE IMPLEMENTED. OF ADDITIONAL NOTE AND EMPHASIS ARE THOSE ACTIVITIES (E.G., PIPE INSTALLATION, MANHOLE INSTALLATION, ETC.) THAT POTENTIALLY INVOLVE WORK WITHIN THE EXCAVATION AREA ONCE EXCAVATION/BACKFILL ACTIVITIES ARE INITIATED, AND THAT REQUIRE WORKER ACCESS INTO THE EXCAVATED AREA. THE CONTRACTOR SHALL CLEARLY IDENTIFY AND EVALUATE THE SPECIFIC TYPES OF ACTIVITIES THAT COULD INVOLVE WORKER ENTRY INTO THE EXCAVATION AREA, SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTION EQUIPMENT, COMMUNICATIONS, ETC. FURTHER, TO THE EXTENT PRACTICABLE (AS DETERMINED BY THE CONTRACTOR), THE CONTRACTOR IS ENCOURAGED TO MINIMIZE WORKER ENTRY INTO THE EXCAVATED AREA.

6. CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF TRAFFIC ON FOOD CENTER DRIVE AND THE PROPERTY.

7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SAFETY PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY. THIS INCLUDES THE PREPARATION OF A SITE–SPECIFIC HASP PRIOR TO ANY WORK AT THE SITE.

8. SECURITY FENCING SHALL BE INSTALLED AROUND THE AREAS IDENTIFIED AS "FOR CONTRACTOR USE" AND "PROJECT WORK AREA" PER THE SPECIFICATIONS. THE CONTRACTOR SHALL EQUIP EXISTING PERIMETER FENCING AND TEMPORARY FENCING WITH "NO TRESPASSING" SIGNS.

9. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SITE SECURITY MEASURES NECESSARY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLES INTO THE PROJECT CONSTRUCTION AREA (INCLUDING THE OWNERS AND EMPLOYEES OF ONSITE BUILDINGS) DURING BOTH WORKING AND NON–WORKING HOURS (24 HOURS A DAY/SEVEN DAYS A WEEK). MINIMUM SITE SECURITY MEASURES SHALL INCLUDE PERIMETER FENCING/BARRIERS, SIGNAGE, AND AN ON–SITE SECURITY GUARD (DURING NON–WORKING HOURS SEVEN DAYS A WEEK) FROM THE DATE OF INITIAL MOBILIZATION UNTIL THE DATE OF FINAL DEMOBILIZATION. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SITE AND ITS EQUIPMENT AND MATERIALS AT THE END OF EACH WORK DAY.

10. THE TEMPORARY SURFACE COVER SYSTEM SHALL BE INSTALLED OVER ANY PORTION OF THE AREA FOR CONTRACTOR USE SELECTED FOR USE BY THE CONTRACTOR. NO WORK SHALL BE CONDUCTED OVER THE EXISTING SURFACE OF PARCEL D (I.E., AREA FOR CONTRACTOR USE), WITH THE EXCEPTION OF THE INSTALLATION OF THE TEMPORARY SURFACE COVER SYSTEM.

UTILITY NOTES:

1. THE LOCATIONS OF ALL ABOVE– AND UNDERGROUND UTILITIES ARE APPROXIMATE.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND/OR MAINTENANCE OF ABOVE– AND UNDERGROUND UTILITIES DURING CONSTRUCTION. THE LOCATION OF ALL ABOVE– AND UNDERGROUND UTILITIES MUST BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK (1–800–962–7962) AND ALL APPLICABLE UTILITY COMPANIES FOR LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY REMOVAL, RELOCATION, AND REPLACEMENT OF ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE WORK.

3. CONTRACTOR SHALL BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ON–SITE AND/OR OFF–SITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES. ALL REPAIRS/REPLACEMENTS SHALL MEET OR EXCEED EXISTING CONDITIONS.

SITE MANAGEMENT/PROJECT PERFORMANCE NOTES:

1. WORK ACTIVITIES SHALL BE PERFORMED ON NON–HOLIDAY WEEKDAYS (MONDAY THROUGH FRIDAY) BETWEEN THE HOURS OF 7:00 AM AND 6:00 PM EXCEPT IN CASES OF EMERGENCY OR UNLESS PRIOR APPROVAL HAS BEEN OBTAINED FROM CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

2. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO COMPLETE THE STORM SEWER PIPE LINE REPLACEMENT AND RELATED WORK SHOWN ON THE DESIGN DRAWINGS.

3. ALL WORK SHALL BE PERFORMED IN A NEAT AND ORDERLY MANNER, IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, AND BY COMPETENT, EXPERIENCED PERSONNEL. MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH ALL CODES, REGULATIONS, AND REQUIREMENTS OF ALL APPLICABLE CITY, STATE, FEDERAL, AND OTHER PUBLIC OR PRIVATE AUTHORITIES.

4. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF ODORS, VAPORS, AND DUST GENERATED DURING THE WORK. ODORS SHALL BE CONTROLLED TO THE SATISFACTION OF THE OWNER/OVERSIGHT ENGINEER AND NYSDEC AND SUCH THAT NO MGP ODORS ARE DETECTABLE AT THE SITE PERIMETER. VAPORS AND DUST SHALL BE CONTROLLED AS NECESSARY TO MEET THE 1) COMMUNITY AIR MONITORING ACTION LEVELS SET FORTH IN THE CAMP AND 2) WORK ZONE AIR MONITORING ACTION LEVELS SET FORTH IN THE CONTRACTOR'S HASP.

5. REAL–TIME WORK ZONE AIR MONITORING SHALL BE PERFORMED BY THE CONTRACTOR ON A CONTINUOUS BASIS DURING ALL INTRUSIVE AND/OR POTENTIAL DUST–GENERATING ACTIVITIES.

6. COMMUNITY AIR MONITORING WILL BE PERFORMED BY THE OWNER ON A CONTINUOUS BASIS DURING THE REMEDIAL CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL VERIFY THAT COMMUNITY AIR MONITORING IS BEING PERFORMED PRIOR TO INITIATING INTRUSIVE AND/OR POTENTIAL DUST–GENERATING ACTIVITIES (I.E., SITE PREPARATION, EXCAVATION, ETC.) EACH DAY.

7. THE CONTRACTOR SHALL MEET ALL NOISE ORDINANCES AND MAKE EVERY EFFORT TO MINIMIZE NOISE CAUSED BY CONSTRUCTION OPERATIONS. EQUIPMENT SHALL BE EQUIPPED WITH SILENCERS OR MUFFLERS DESIGNED TO OPERATE WITH THE LEAST POSSIBLE NOISE IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL NOISE ORDINANCES.

8. THE CONTRACTOR SHALL PERFORM AND MAINTAIN SURVEY CONTROL THROUGHOUT THE COURSE OF THE WORK. SURVEY DOCUMENTATION OF PRE–CONSTRUCTION, POST–CONSTRUCTION, AND RESTORED CONDITIONS SHALL BE PREPARED AND CERTIFIED BY A LICENSED PROFESSIONAL LAND SURVEYOR. CONTRACTOR SHALL PROVIDE WITH RECORD DRAWINGS AT PROJECT COMPLETION.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY EROSION AND SEDIMENTATION CONTROLS THROUGHOUT CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

10. THE CONTRACTOR SHALL ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT CONSTRUCTION AREA (INCLUDING EXCLUSION, CONTAMINATION REDUCTION, AND SUPPORT ZONES).

11. ALL WORK SHALL BE PERFORMED WITHIN THE PROJECT CONSTRUCTION AREA (I.E., PROJECT WORK AREA AND AREA DESIGNATED FOR CONTRACTOR USE). NO WORK SHALL BE PERFORMED BEYOND THE PROJECT CONSTRUCTION AREA WITHOUT PRIOR APPROVAL FROM THE OWNER/DESIGN ENGINEER.

12. THE CONTRACTOR SHALL REMOVE ABOVEGROUND AND UNDERGROUND NON–EARTHEN MATERIALS (E.G., BRUSH, LOGS, TREES, STUMPS, BRICK, CONCRETE, PIPING, ETC.) AS REQUIRED TO PERFORM THE WORK. SUCH MATERIALS SHALL BE CHARACTERIZED IN ACCORDANCE WITH THE WMP, DOWNSIZED (AS REQUIRED BY THE WASTE TRANSPORTATION AND DISPOSITION VENDORS), AND TRANSPORTED OFF–SITE TO AN APPROPRIATE, OWNER–APPROVED DISPOSAL FACILITY. CHARACTERIZATION REQUIREMENTS AND RESULTS SHALL BE SUBMITTED TO THE OWNER/DESIGN ENGINEER FOR REVIEW PRIOR TO TRANSPORTING NON–EARTHEN MATERIALS OFF–SITE FOR DISPOSAL.

13. SITE ACCESS SHALL BE FROM FOOD CENTER DRIVE. CONTRACTOR SHALL INSTALL NEW STABILIZED CONSTRUCTION ENTRANCE INTO PARCEL D AS SHOWN ON THE DESIGN DRAWINGS.

14. CONTRACTOR IS RESPONSIBLE TO MAINTAIN ACCESS TO ALL AREAS OF THE SITE DURING CONSTRUCTION.

15. CONSTRUCTION FENCING SHALL BE INSTALLED AROUND ACCESSIBLE PORTIONS OF ANY OPEN EXCAVATION.

16. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY TRAFFIC CONTROL MEASURES (E.G., FLAGGERS, SIGNS, CONES, ETC.) AND COORDINATING THE HAULING OF MATERIALS ON PUBLIC ROADWAYS. THE LOADING/UNLOADING OF MATERIALS AND EQUIPMENT WITHIN FOOD CENTER DRIVE IS PROHIBITED.

17. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING, COORDINATING, LOADING, AND TRANSPORTING EXCAVATED/REMOVED MATERIALS OFF–SITE FOR TREATMENT/DISPOSAL AT APPROPRIATE OWNER–APPROVED DISPOSAL FACILITIES.

18. THE CONTRACTOR SHALL PREVENT TRACKING OF SOIL MATERIALS ONTO OFF–SITE AREAS. ANY SOIL MATERIALS ACCIDENTALLY TRACKED OR OTHERWISE SPILLED OR DROPPED ONTO OFF–SITE AREAS SHALL BE IMMEDIATELY CLEANED UP BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

19. NO EXCAVATED MATERIALS OR SUPPLIES OF ANY KIND SHALL BE STORED ON PRIVATE OR PUBLIC PREMISES WITHOUT PRIOR APPROVAL FROM THE OWNER/OVERSIGHT ENGINEER.

20. ALL EQUIPMENT OPERATED WITHIN THE PROJECT CONSTRUCTION AREA (I.E., PROJECT WORK AREA AND AREA DESIGNATED FOR CONTRACTOR USE) SHALL BE DECONTAMINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PRIOR TO ARRIVING ON–SITE AND PRIOR TO LEAVING THE PROJECT CONSTRUCTION AREA. PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS SHALL BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING IMPORTED BACKFILL MATERIAL.

21. EXISTING SITE FEATURES NOT SPECIFICALLY IDENTIFIED ON THE DESIGN DRAWINGS MAY REQUIRE REMOVAL BY THE CONTRACTOR TO FACILITATE CONSTRUCTION. THE REMOVAL OF SUCH FEATURES SHALL NOT BE PERFORMED WITHOUT PRIOR APPROVAL FROM THE OWNER/OVERSIGHT ENGINEER.

22. UPON COMPLETION OF CONSTRUCTION, THE WORK AREA SHALL BE LEFT IN A CLEAN, NEAT, AND ORDERLY CONDITION.

CITY: SYRACUSE_NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BAUSTERT LYR:ON=*;OFF=*REF*
G:\ENV\CADD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G01.DWG LAYOUT: 1 SAVED: 9/22/2014 3:38 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:26 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

No.	Date	Revisions	By	Ckd

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN	
Professional Engineer's No.	084067	
State	NY	Date Signed 9/15/14
Project Mgr.	MKH	
Designed by	MAD	Drawn by BGG
Checked by	JDB	

STATE OF NEW YORK · JASON D. BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

GENERAL NOTES AND ABBREVIATIONS

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0009\00020\DWG\CONTRACT43027G02.DWG LAYOUT: 2 SAVED: 11/21/2013 9:51 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES:
43027X00
43027X01

ON ED

27.52'

GAS TRANSMISSION EASEMENT TO IROQUOIS

FOOD CENTER DRIVE (NOT MAPPED)

FOOD CENTER DRIVE

CONCRETE SIDEWALK

CONCRETE SW

NOT IN USE

BRUSH / OVERGROWTH

PARCEL D

PURIFIER WASTE AREA (APPROXIMATE)

GATE

ASPHALT

ASPHALT PARKING LOT

ST l=6.11' 12" DIA RCP

ST 20" DIA RCP

ST l=3.16'

ST l=2.76' 20" DIA RCP

ST l=2.72' 12" DIA RCP

ST l=2.52'

ST 20" DIA RCP

EMPTY STEEL CONDUIT

CONCRETE THRUST BLOCK

15" DIA

12" DIA

RIP-RAP

CONCRETE LANDING PAD

ASPHALT PARKING LOT BELOW OVERHEAD STRUCTURE

CANOPY

CONCRETE SIDEWALK

CONCRETE PAD

CONCRETE SID

BRONX RIVER

EBB AND FLOW

LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- EXISTING RAILROAD TRACKS
- BUILDING
- TREE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- SANITARY SEWER LINE
- GAS LINE
- ELECTRIC LINE
- COMMUTER LINE
- OUTFALL
- CATCH BASIN
- MANHOLE
- LIGHT POLE
- HYDRANT
- VALVE
- BOLLARD
- STAND PIPE
- SIGN
- SURVEY CONTROL POINT
- CONCRETE LANDING PAD
- APPROXIMATE DRAINAGE AREA
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D

30' 0 30' 60'

1"=30'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 9/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK * JASON DAVID BRIEN * 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

EXISTING SITE CONDITIONS

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

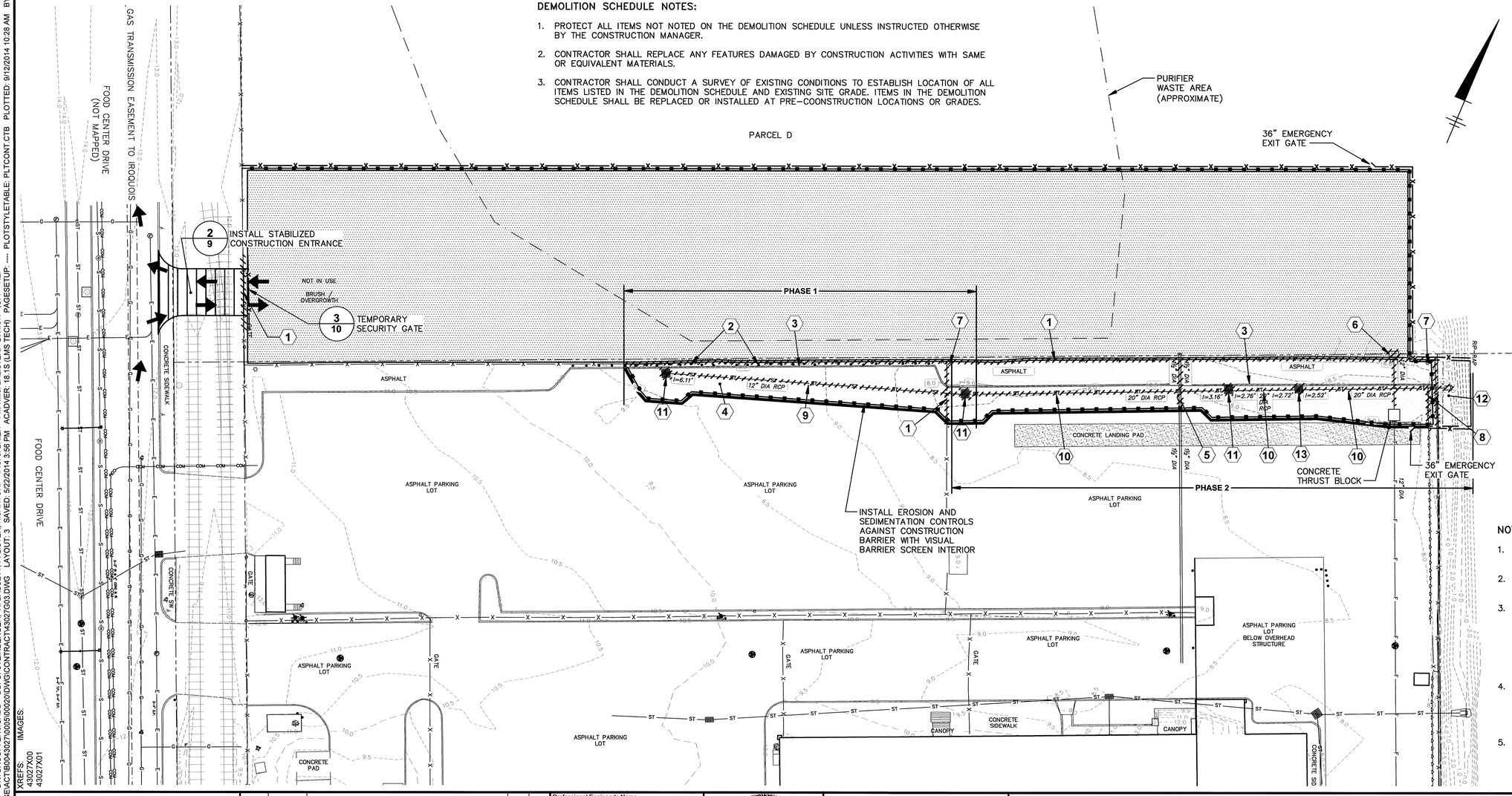
ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

DEMOLITION SCHEDULE		
NO.	ITEM	ACTION
1	CHAIN LINK FENCE WITH BARBED WIRE	REMOVE AS NECESSARY TO COMPLETE THE WORK. INSTALL NEW CHAIN LINK FENCE WITH BARBED WIRE AFTER WORK IS COMPLETE. REFER TO DETAIL ON DWG. 10. REMOUNT EXISTING SIGNAGE ON NEW FENCE.
2	BOLLARDS	REMOVE AS NECESSARY TO COMPLETE THE WORK. REINSTALL BOLLARDS IN CLASS 'B' CONCRETE AFTER WORK IS COMPLETE. (TYP.)
3	CONCRETE CURB	REMOVE, SAVE AND REUSE AS NECESSARY TO COMPLETE THE WORK.
4	ASPHALT	SAW CUT AND REMOVE AS NECESSARY TO COMPLETE THE WORK. FINAL SITE SHALL BE RE-PAVED. REFER TO DETAILS ON DWGS. 7 AND 8. PAINT PAVEMENT MARKINGS TO MATCH EXISTING.
5	(2) 1½"ø STEEL CONDUIT	REMOVE AS NECESSARY TO COMPLETE THE WORK. REPLACE IN KIND AFTER WORK IS COMPLETE.
6	FIRE SERVICE LINE	COORDINATE WITH OWNER TO TURN OFF SERVICE. DRAIN AS NECESSARY. REMOVE EXISTING THRUST BLOCK AND PIPING AS NECESSARY TO COMPLETE THE WORK. CAP PIPE AND INSTALL A 6' X 6' X 6' THRUST BLOCK AT NEW LOCATION. CAP SHALL BE A 12"ø MECHANICAL JOINT CAP WITH MECHANICAL JOINT RESTRAINT (EBAA SERIES 1100 MEGALUG OR APPROVED EQUAL).

DEMOLITION SCHEDULE		
NO.	ITEM	ACTION
7	LIGHT POST	REMOVE AS NECESSARY TO COMPLETE THE WORK. REPLACE AFTER WORK IS COMPLETE. REFER TO DETAIL ON DWG. 10.
8	GUARDRAIL	REMOVE AS NECESSARY TO COMPLETE THE WORK. INSTALL NEW GUARDRAIL IN CLASS 'B' CONCRETE AFTER WORK IS COMPLETE.
9	12"ø RCP	REMOVE AND REPLACE WITH NEW 12"ø HDPE PIPE. REFER TO PLAN AND PROFILE ON DWG. 6.
10	20"ø RCP	REMOVE AND REPLACE WITH NEW 20"ø HDPE PIPE. REFER TO PLAN AND PROFILE ON DWG. 6.
11	CATCH BASIN	REMOVE AND REPLACE WITH NEW HDPE CATCH BASIN. REFER TO PLAN AND PROFILE ON DWG. 6.
12	RIP-RAP	REMOVE AND REUSE AS NECESSARY TO COMPLETE THE WORK.
13	CATCH BASIN CB-120	REMOVE.

DEMOLITION SCHEDULE NOTES:

1. PROTECT ALL ITEMS NOT NOTED ON THE DEMOLITION SCHEDULE UNLESS INSTRUCTED OTHERWISE BY THE CONSTRUCTION MANAGER.
2. CONTRACTOR SHALL REPLACE ANY FEATURES DAMAGED BY CONSTRUCTION ACTIVITIES WITH SAME OR EQUIVALENT MATERIALS.
3. CONTRACTOR SHALL CONDUCT A SURVEY OF EXISTING CONDITIONS TO ESTABLISH LOCATION OF ALL ITEMS LISTED IN THE DEMOLITION SCHEDULE AND EXISTING SITE GRADE. ITEMS IN THE DEMOLITION SCHEDULE SHALL BE REPLACED OR INSTALLED AT PRE-COONSTRUCTION LOCATIONS OR GRADES.



LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- EXISTING RAILROAD TRACKS
- BUILDING
- TREE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- SANITARY SEWER LINE
- GAS LINE
- ELECTRIC LINE
- COMMUTER LINE
- OUTFALL
- CATCH BASIN
- MANHOLE
- LIGHT POLE
- HYDRANT
- VALVE
- BOLLARD
- STAND PIPE
- SIGN
- SURVEY CONTROL POINT
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D
- TEMPORARY SECURITY FENCE
- TEMPORARY SECURITY GATE (3/10)
- EROSION AND SEDIMENTATION CONTROLS (3/9)
- CONSTRUCTION BARRIER WITH VISUAL BARRIER SCREEN
- REMOVE/DEMOLISH
- AREA FOR CONTRACTOR USE (APPROXIMATELY 620' X 100') (SEE NOTES 3 AND 4) (5/9)
- PROJECT WORK AREA
- CONSTRUCTION VEHICLE ACCESS
- (1) DEMOLITION SCHEDULE CALLOUT

NOTES:

1. TEMPORARY LIGHTING SHALL BE USED AS REQUESTED BY OWNER OR OWNER'S REPRESENTATIVE.
2. PROJECT CONSTRUCTION AREA INCLUSIVE OF THE AREA FOR CONTRACTOR USE AND PROJECT WORK AREA
3. CONTRACTOR SHALL CLEAR AREA FOR CONTRACTOR USE (TO THE EXTENT NECESSARY TO PERFORM THE WORK), INSTALL PERIMETER EROSION AND SEDIMENTATION CONTROLS, AND IMPROVE GROUND SURFACE TO INSTALL THE SPECIFIED TEMPORARY FACILITIES (I.E., ACCESS ROADS, STAGING AREA, DECONTAMINATION AREA, OFFICE TRAILERS, ETC.) NECESSARY TO SUPPORT AND PERFORM THE CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL TEMPORARY SURFACE COVER SYSTEM OVER THE SELECTED LIMITS OF AREA FOR CONTRACTOR USE. SPECIAL PROVISIONS SHALL BE ACCOUNTED FOR TO PROMOTE CONTAINMENT FOR THE TEMPORARY WATER MANAGEMENT SYSTEM.
5. CONTRACTOR SHALL INSPECT THE INSTALLED TEMPORARY FACILITIES DAILY FOR CONFORMANCE WITH THE MINIMUM REQUIREMENTS PROVIDED IN THE DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE TEMPORARY FACILITIES AND IMPROVING AS NECESSARY.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM:J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\0020\DWG\CONTRACT\43027G03.DWG LAYOUT: 3 SAVED: 5/22/2014 3:56 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES:
43027X00
43027X01

1"=30' (30' 0 30' 60')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067

State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK * JASON DAVID BRIEN * LICENSED PROFESSIONAL ENGINEER * 084067

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

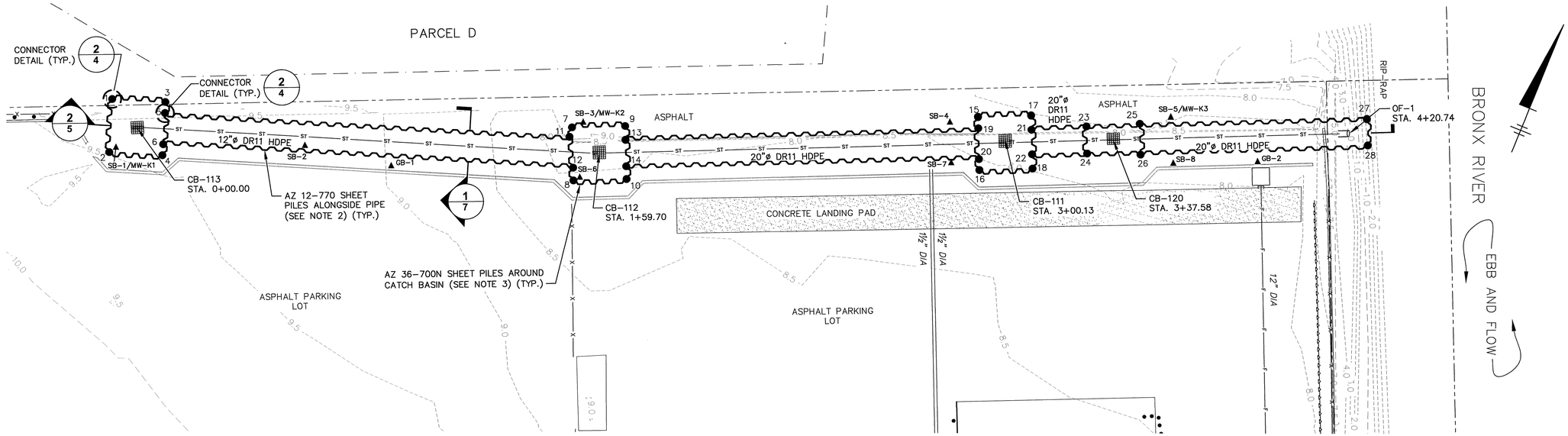
SITE PREPARATION PLAN

ARCADIS Project No.: B0043027.0005.00020

Date: SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

3



PLAN 1

0 20' 40'

SCALE: 1"=20'

LEGEND:

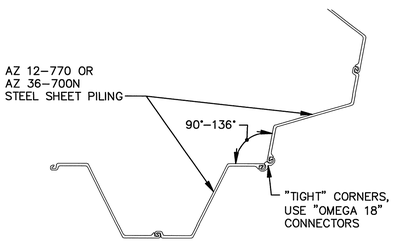
- PROPERTY LINE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- OUTFALL
- CATCH BASIN
- LIGHT POLE
- BOLLARD
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE
- SOIL BORING
- SURVEY CONTROL POINT
- CONSTRUCTION BARRIER WITH VISUAL BARRIER SCREEN
- STEEL SHEET PILING (SEE NOTES 2 AND 3)

EXCAVATION SUPPORT NOTES:

1. REFER TO DRAWING 1 FOR ADDITIONAL NOTES AND DRAWING 2 FOR ADDITIONAL BASE MAP INFORMATION.
2. SHEET PILING CONSISTS OF MINIMUM 32 FEET LONG, GRADE 50, AZ 12-770 STEEL SHEET PILING, OR APPROVED EQUAL FOR PIPE EXCAVATION AND INSTALLATION OF COFFER DAM USED FOR DEWATERING OF THE RIVER.
3. SHEET PILING CONSISTS OF MINIMUM 37.5 FEET LONG, GRADE 50, AZ 36-700N STEEL SHEET PILING, OR APPROVED EQUAL FOR CATCH BASIN EXCAVATION AND INSTALLATION. SHEET PILES SHALL BE INSTALLED TO THE DEPTHS AND LIMITS AS INDICATED ON THE TECHNICAL SPECIFICATIONS.
4. IF MINIMUM SHEET PILE LENGTHS ARE USED, PLACE SANDBAGS ALONGSIDE EXCAVATION TO PREVENT STORMWATER FROM ENTERING TRENCH FOR A MINIMUM OF 6" HIGH.
5. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
6. TEMPORARY LOADING OR STOCKPILING OF SOILS MAY BE PERMITTED WITHIN 25 FEET OF THE SHEET PILE ALIGNMENT DURING EXCAVATION AND BACKFILLING ACTIVITIES ASSOCIATED WITH INSTALLATION OF THE NEW HDPE PIPE. LOADING OR STOCKPILING ACTIVITIES SHALL BE LIMITED TO A PERIOD OF NOT MORE THAN ONE HOUR.
7. LOCATIONS, SIZES, DEPTHS, AND MATERIALS ASSOCIATED WITH SUBSURFACE PIPING CAN BE FOUND ON DWG. 2, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
8. LIMITS OF EXCAVATION SHALL BE ESTABLISHED A MINIMUM OF 2-FOOT AROUND AND BELOW CATCH BASINS AND HDPE PIPE TO BE INSTALLED.
9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING EXCAVATION SUPPORT IN ACCORDANCE WITH THE DESIGN DRAWINGS AND TECHNICAL SPECIFICATIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SAFE AND ADEQUATE VEHICLE/EQUIPMENT ACCESS AND EGRESS TO THE EXCAVATION AREA TO FACILITATE THE EXCAVATION OF MATERIALS TO THE HORIZONTAL AND VERTICAL LIMITS IDENTIFIED ON THIS DRAWING OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
11. ALL WATER THAT ENTERS THE EXCAVATION LIMITS SHALL BE COLLECTED VIA THE PRE-TREATMENT SYSTEM (I.E., BAG FILTERS) AND CONTAINERIZED FOR OFFSITE DISPOSAL.
12. EXCAVATION SUPPORT MATERIALS TO BE DECONTAMINATED TO THE SATISFACTION OF CONSTRUCTION MANAGER PRIOR TO REMOVAL FROM SITE.
13. VERTICAL SCALE REPRESENTS ELEVATIONS IN FEET IN BRONX HIGHWAY DATUM.
14. HORIZONTAL SCALE ON PROFILE REPRESENTS STATIONING IN FEET.

SURVEY CONTROL POINTS		
POINT NO.	NORTHING	EASTING
1	720498.2553	666112.8229
2	720480.8873	666118.8174
3	720504.2497	666130.1908
4	720486.8818	666136.1853
5	720500.6670	666131.4883
6	720490.5021	666134.9967
7	720549.5357	666263.3361
8	720532.7254	666270.7517
9	720556.9513	666280.1465
10	720540.1410	666287.5621
11	720546.1413	666263.7741
12	720536.7454	666268.9784
13	720552.5473	666282.0892
14	720544.1899	666285.7759

SURVEY CONTROL POINTS		
POINT NO.	NORTHING	EASTING
15	720606.2124	666391.8152
16	720589.4021	666399.2309
17	720613.6280	666408.6256
18	720596.8177	666416.0412
19	720602.6238	666393.3983
20	720592.8647	666397.6404
21	720609.1113	666410.6180
22	720601.3344	666414.0487
23	720617.3792	666427.7739
24	720608.7858	666431.5647
25	720625.2631	666444.4407
26	720615.4245	666448.7807
27	720656.4620	666516.4077
28	720648.1508	666520.1759



CONNECTOR DETAIL 2

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\0020\DWG\CONTRACT\43027G04.DWG LAYOUT: 4 SAVED: 4/10/2014 4:20 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:29 AM BY: GETTS, BRIAN
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067

State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by: APC	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

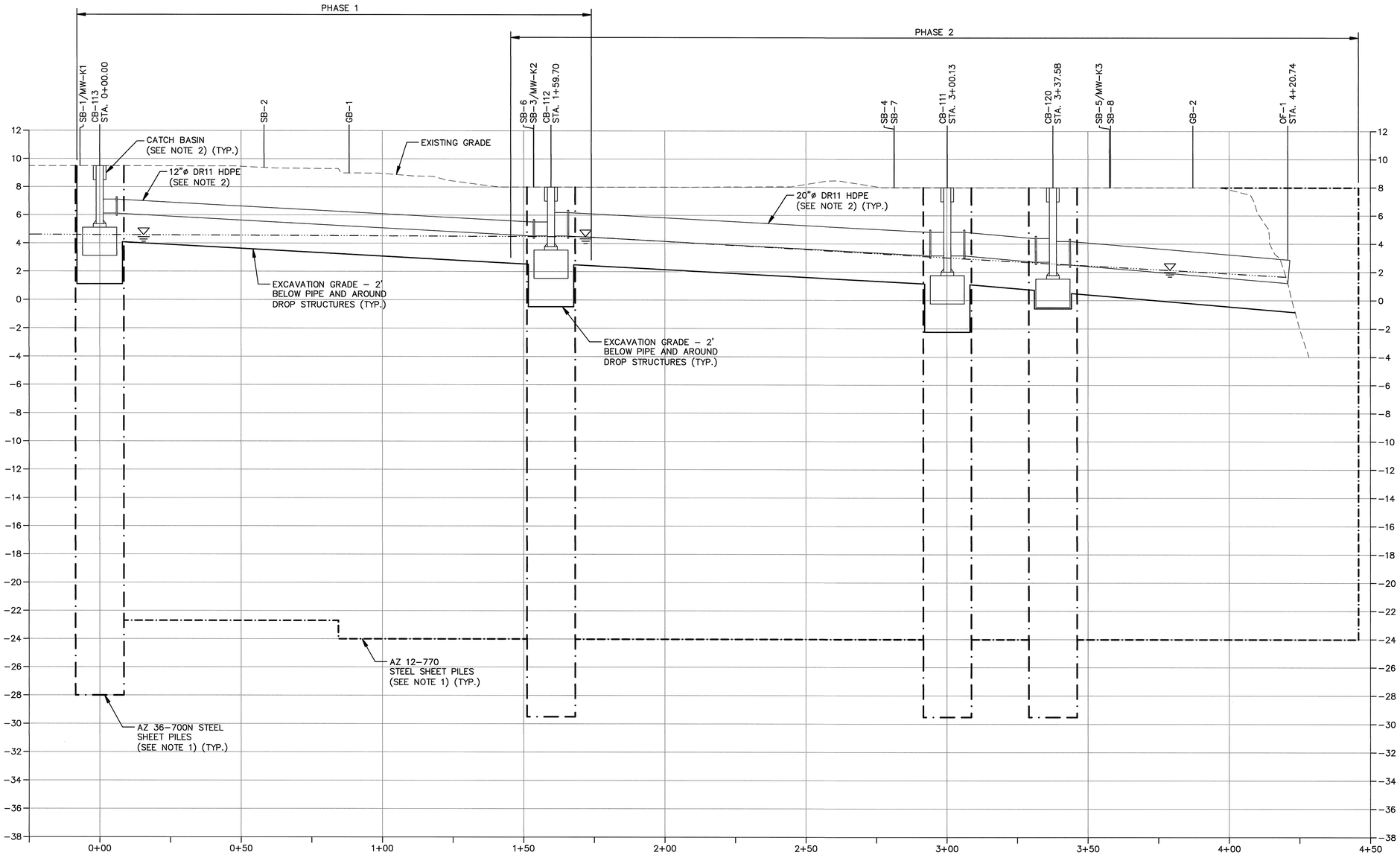
EXCAVATION SUPPORT PLAN

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

4



EXCAVATION SUPPORT PROFILE 2

0 20' 40'
HORIZONTAL SCALE: 1"=20'
0 4' 8'
VERTICAL SCALE: 1"=4'

NOTES:

1. SHEET PILING CONSISTS OF MINIMUM 32 FEET LONG, GRADE 50, AZ 12–770 STEEL SHEET PILING, OR APPROVED EQUAL FOR PIPE EXCAVATION AND INSTALLATION OF COFFER DAM USED FOR DEWATERING OF THE RIVER.
2. SHEET PILING CONSISTS OF MINIMUM 37.5 FEET LONG, GRADE 50, AZ 36–700N STEEL SHEET PILING, OR APPROVED EQUAL FOR CATCH BASIN EXCAVATION AND INSTALLATION. SHEET PILES SHALL BE INSTALLED TO THE DEPTHS AND LIMITS AS INDICATED ON THE TECHNICAL SPECIFICATIONS.
3. REFER TO DWGS. 6 AND 7 FOR ADDITIONAL STORM SEWER INFORMATION.
4. SOIL BORING INFORMATION CAN BE FOUND IN THE 2013 PRE–DESIGN INVESTIGATION REPORT.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G04.DWG LAYOUT: 5 SAVED: 4/10/2014 4:20 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INCHES

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN
Professional Engineer's No.: 084067
State: NY | Date Signed: 9/15/14 | Project Mgr.: MKH
Designed by: APC | Drawn by: BGG | Checked by: JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK
STORM SEWER REPLACEMENT

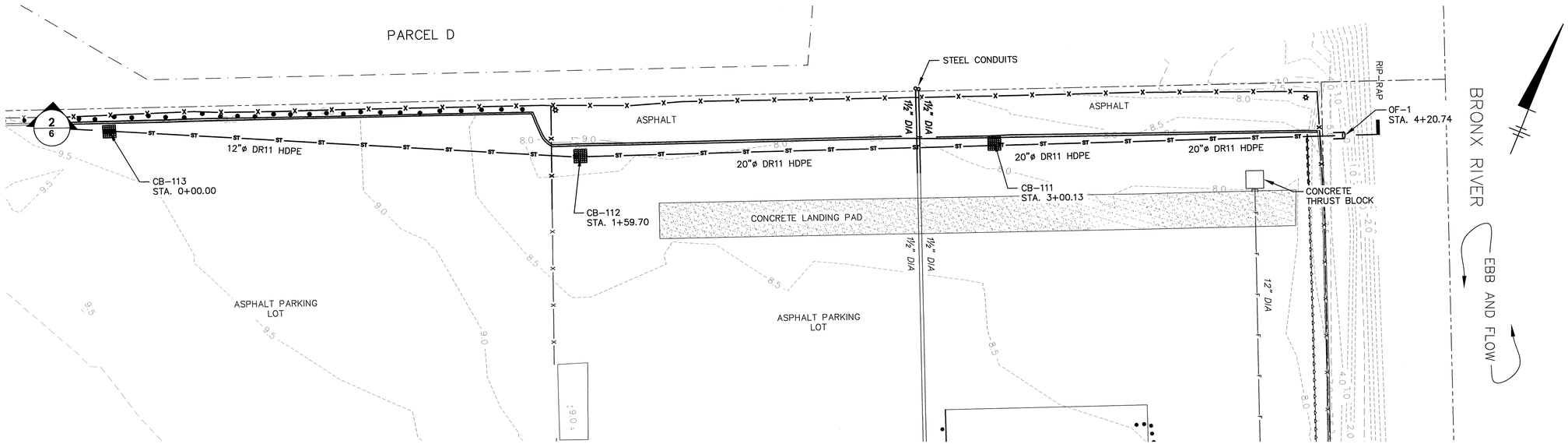
EXCAVATION SUPPORT PROFILE

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

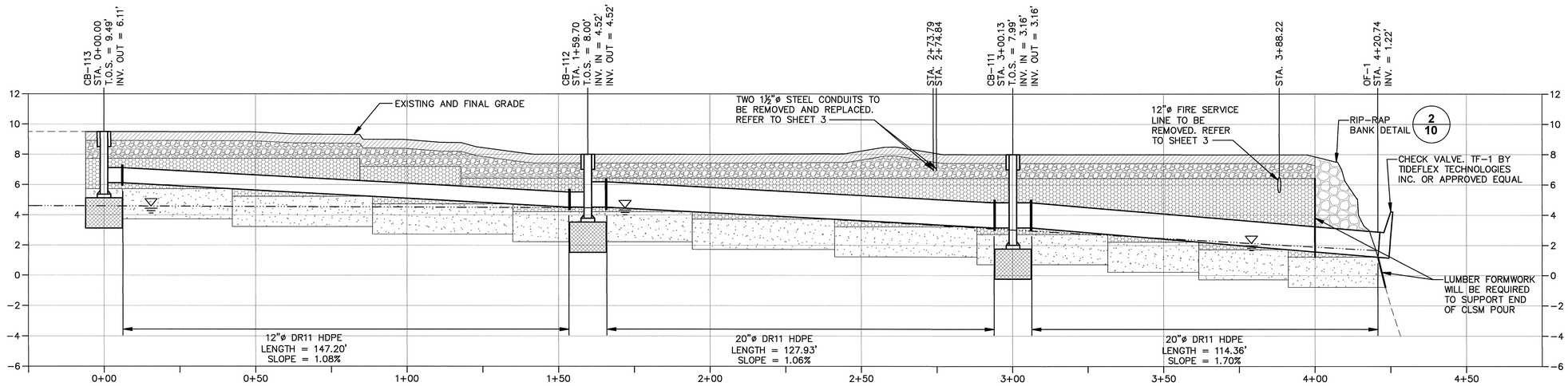
5



PLAN 1

0 20' 40'

SCALE: 1"=20'



STORM SEWER PROFILE 2

0 20' 40'

HORIZONTAL SCALE: 1"=20'

0 4' 8'

VERTICAL SCALE: 1"=4'

LEGEND:

- PROPERTY LINE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- OUTFALL
- CATCH BASIN
- LIGHT POLE
- BOLLARD
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D
- CLSM A (PROFILE ONLY)
- CLSM B (PROFILE ONLY)
- CLSM C (PROFILE ONLY)
- TYPE "F" RUN OF CRUSHER STONE (PROFILE ONLY)
- RIP RAP (PROFILE ONLY)
- ASPHALT (PROFILE ONLY)

NOTES:

1. REFER TO CLSM SCHEDULE ON DWG. 7 FOR NOTES ON CLSM INSTALLATION.
2. NEW AND RESTORED FEATURES SHOWN IN BOLD.
3. CLSM TO BE INSTALLED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF* G:\ENV\CAD\SYRACUSE\ACTIVE\B0043027\0005\0020\DWG\CONTRACT\43027G06.DWG LAYOUT: 6 SAVED: 4/10/2014 2:39 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:30 AM BY: GETTS, BRIAN
XREFS:
43027X00
43027X01
IMAGES:

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN
Professional Engineer's No.	084067
State	NY
Date Signed	9/15/14
Project Mgr.	MKH
Designed by	MAD
Drawn by	BGG
Checked by	JDB

STATE OF NEW YORK * JASON DAVID BRIEN * 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

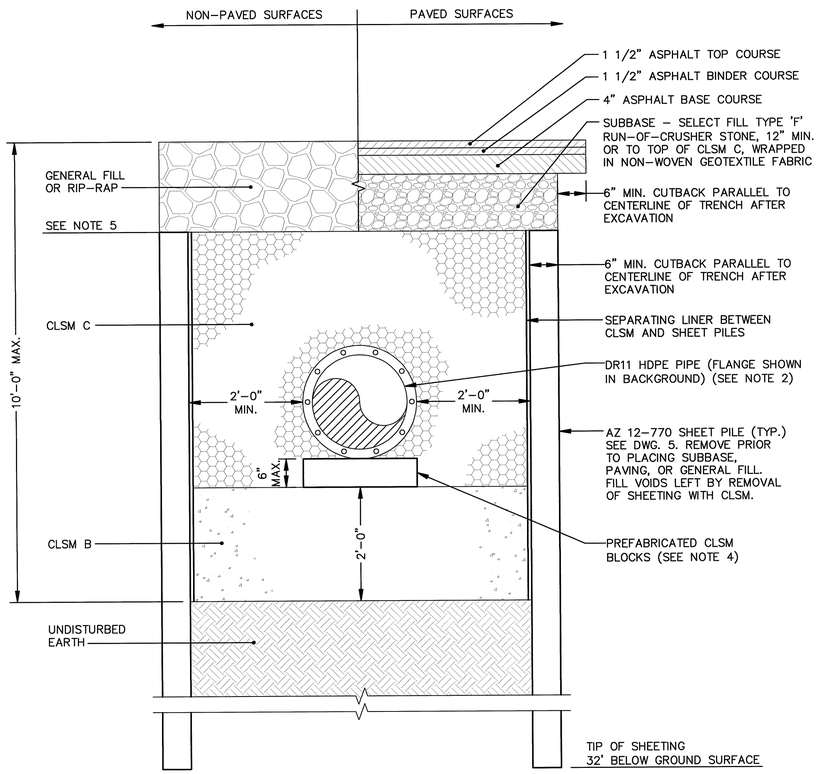
STORM SEWER PLAN AND PROFILE

ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

6



CLSM SCHEDULE		
NAME	NOTES	DEPTH
CLSM A	1. POUR CLSM A BEFORE PLACING HDPE CATCH BASIN STRUCTURE. 2. CLSM A SHALL BE CURED 24 HOURS PRIOR TO PLACING OF CATCH BASIN.	BOTTOM OF CLSM A SHALL BE TWO FEET BELOW BOTTOM OF CATCH BASIN.
CLSM B	1. POUR CLSM B AFTER PLACING HDPE CATCH BASIN. 2. POUR CLSM B BEFORE PLACING HDPE PIPING.	TOP OF CLSM B SHALL BE TO THE BOTTOM OF THE LOWEST PIPE FLANGE IN POUR OR TO A MAXIMUM OF 6" BENEATH PIPE. DEPTH OF CLSM B SHALL BE TWO FEET.
CLSM C	1. POUR CLSM C AFTER PLACING HDPE PIPING AND LEAKAGE TESTING IS APPROVED. 2. WATER USED IN LEAK TESTING SHALL BE KEPT IN SYSTEM UNTIL AFTER CLSM C IS POURED.	TOP OF CLSM C SHALL BE TWO FEET ABOVE TOP OF PIPE AT HIGHEST ELEVATION IN POUR OR AS SHOWN IN STORM SEWER PLAN AND PROFILE ON DWG. 6.

NOTES:

1. PLACE ONE COAT OF ASPHALT TACK COAT BETWEEN EACH LAYER OF ASPHALT. ASPHALT TACK COAT SHALL BE DURAFILL D3405 OR EQUAL.
2. REMOVE CLSM B AROUND FLANGE AS REQUIRED TO PROPERLY INSTALL FLANGE.
3. PRIOR TO PLACING CLSM C, TEMPORARILY PLUG HDPE PIPE AND FILL PIPE WITH WATER. AFTER CLSM IS SET, REMOVE PLUG AND DISPOSE OF WATER.
4. CONTRACTOR SHALL PLACE PREFABRICATED CLSM BLOCKS FOR PIPE SUPPORT. BLOCKS SHALL HAVE MAXIMUM DIMENSIONS OF 6" X 6" X 24", BUT SHALL BE ADJUSTED TO FIT SITE AND PIPING CONDITIONS. SUPPORT SPACING SHALL BE DETERMINED BY MANUFACTURER.
5. REMOVE TEMPORARY EXCAVATION SUPPORT PRIOR TO INSTALLATION OF ALL FILL ABOVE CLSM C, INCLUDING GENERAL FILL, RIP-RAP, SELECT FILL, AND ASPHALT COURSES.
6. CLSM TO BE INSTALLED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

LEGEND:

- CLSM B
- CLSM C
- TYPE "F" RUN OF CRUSHER STONE
- RIP-RAP

TRENCH DETAIL 1

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVE\B0043027\0005\00020\DWG\CONTRACT\43027G07.DWG LAYOUT: 7 SAVED: 4/10/2014 1:41 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:30 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name		
JASON D. BRIEN		
Professional Engineer's No.		
084067		
State	Date Signed	Project Mgr.
NY	9/15/14	MKH
Designed by	Drawn by	Checked by
MAD	BGG	JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

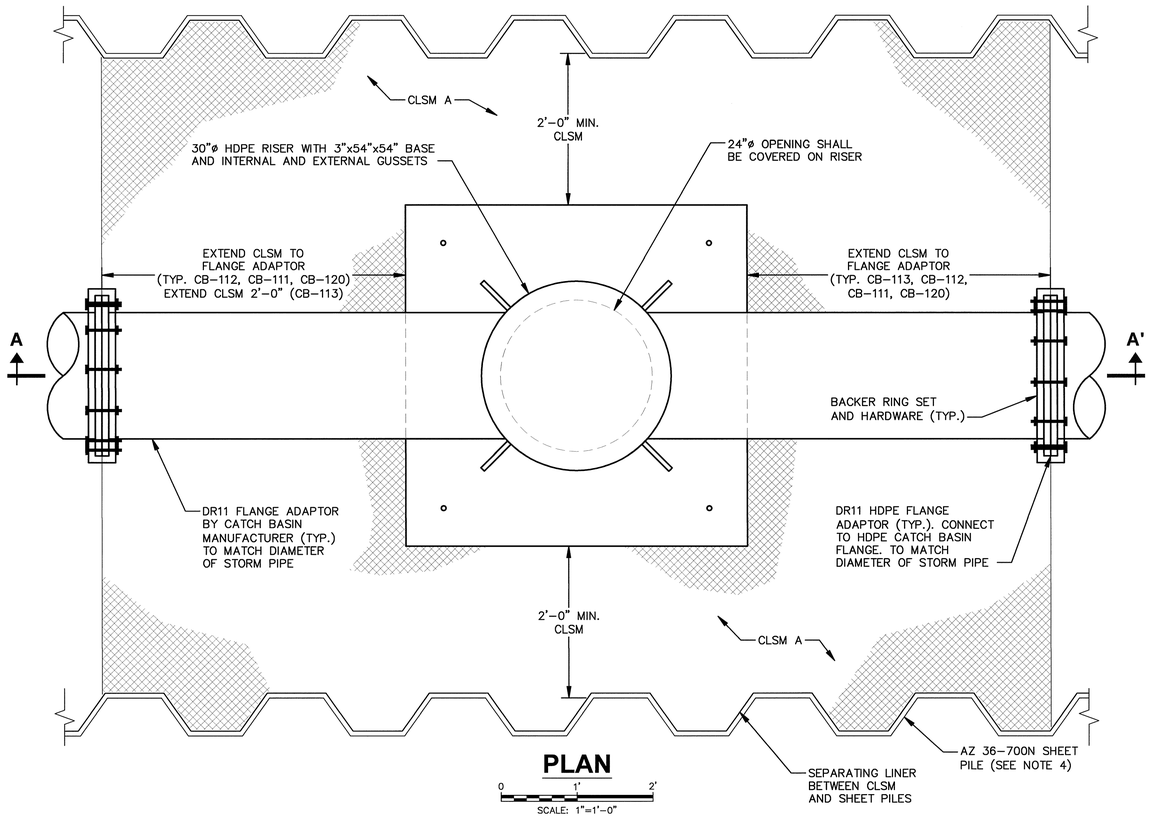
STORM SEWER REPLACEMENT

PIPING AND TRENCH DETAILS

ARCADIS Project No.
B0043027.0005.00020

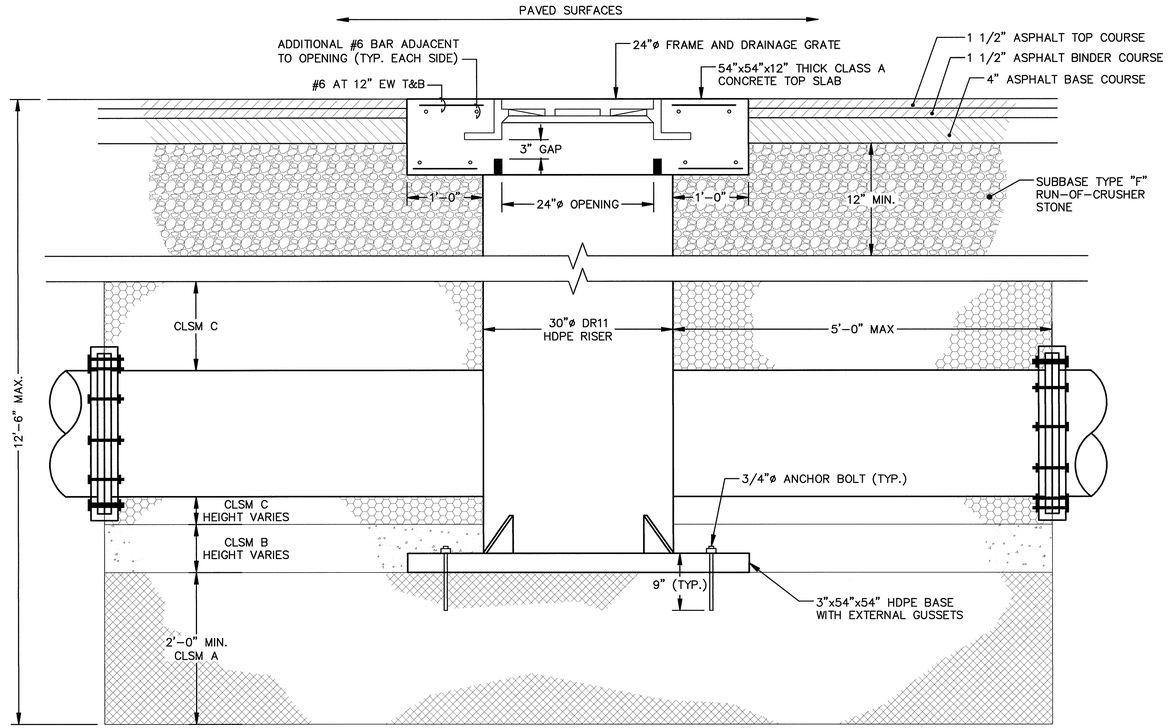
Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120



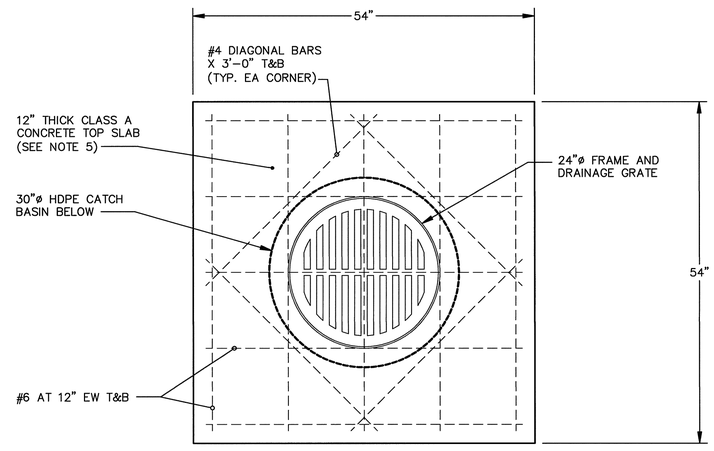
PLAN

SCALE: 1"=1'-0"



SECTION A-A'

SCALE: 1"=1'-0"



TOP SLAB PLAN

SCALE: 1"=1'-0"

NOTES:

1. REFER TO CLSM SCHEDULE ON DWG. 7 FOR NOTES ON CLSM INSTALLATION.
2. CB-113 ONLY REQUIRES ONE FLANGE ADAPTOR. TWO FLANGE ADAPTORS ARE SHOWN TO REPRESENT TYPICAL CATCH BASIN PLAN.
3. PLAN MAY NOT REPRESENT REQUIRED ALIGNMENT OF FLANGE ADAPTORS. ANGLES OF EACH FLANGE ADAPTOR SHALL BE SET FOR EACH CATCH BASIN.
4. TIP OF SHEETING 37.5 FEET BELOW GROUND SURFACE.
5. CONTRACTOR TO SLOPE CONCRETE TOP SLAB, ALL DIRECTIONS, TOWARD CATCH BASIN.
6. CLSM TO BE INSTALLED IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.

LEGEND:

- CLSM A
- CLSM B
- CLSM C
- TYPE "F" RUN OF CRUSHER STONE
- RIP-RAP
- ASPHALT

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: G.STEINBERGER R.BASSETT LD: G.STEINBERGER PIC: K.WHITE PM: M.CARRILLO-SHERIDAN TM: D.CORNELL LYR:ON="OFF="REF"
G:\ENVCAD\SYRACUSE\ACTIB\0043027\0005\00020\DWG\CONTRACT\43027G08.DWG LAYOUT: 8 SAVED: 4/10/2014 11:23 AM ACADVER: 18.1S (LMS TECH) PAGESETUP:--- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:31 AM BY: GETTS, BRIAN
XREFS: IMAGES:
43027X00

SCALE AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name	JASON D. BRIEN		
Professional Engineer's No.	084067		
State	Date Signed	Project Mgr.	
NY	9/15/14	MKH	
Designed by	Drawn by	Checked by	
MAD	BGG	JDB	

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

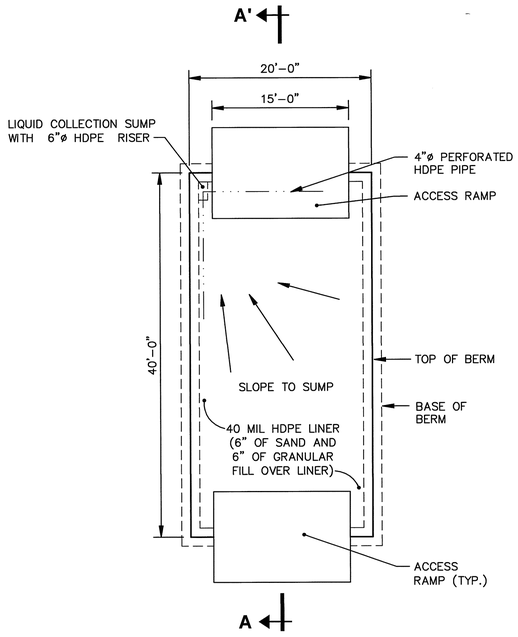
STORM SEWER REPLACEMENT

TYPICAL HDPE CATCH BASIN DETAILS

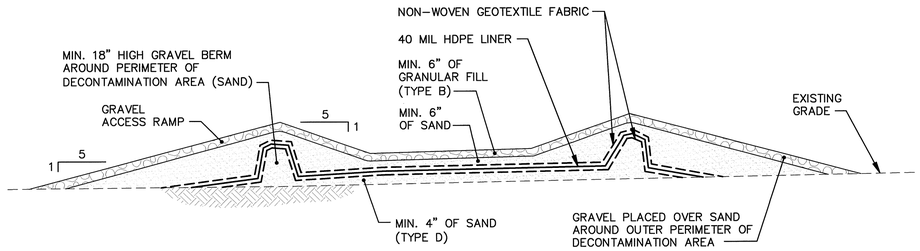
ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120



PLAN



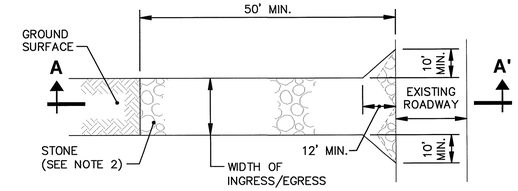
SECTION A-A'

NOTES:

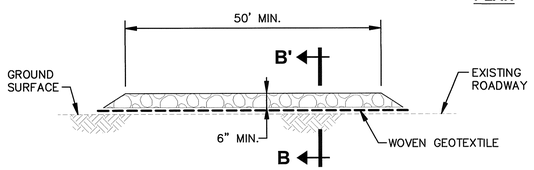
1. DECONTAMINATION AREA SHALL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS SHALL BE PUMPED FROM COLLECTION SUMP INTO 55 GALLON DRUMS OR A TEMPORARY STORAGE TANK (IF NECESSARY).
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE DECONTAMINATION AREA, INCLUDING HDPE LINER AND GEOTEXTILE FABRIC, IS TO BE REMOVED BY THE CONTRACTOR FOR DISPOSAL.

DECONTAMINATION AREA 1

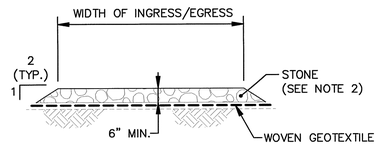
NOT TO SCALE



PLAN



SECTION A-A'



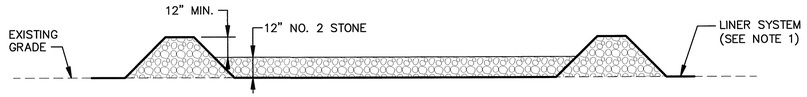
SECTION B-B'

NOTES:

1. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL SITE INGRESS/EGRESS LOCATIONS.
2. STONE SHALL BE A MIX OF 1–INCH TO 4–INCH DIAMETER STONE.

STABILIZED CONSTRUCTION ENTRANCE 2

NOT TO SCALE

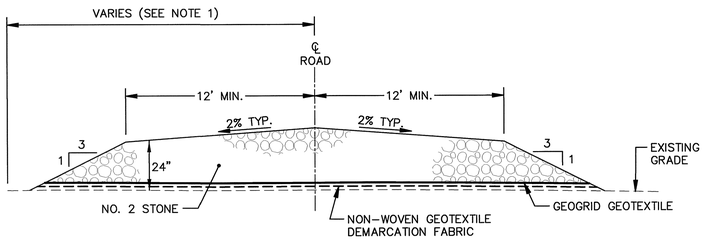


NOTE:

1. PLACE LINER SYSTEM (CONSISTING OF A NON–WOVEN GEOTEXTILE FABRIC, 40 MIL HDPE LINER, AND NON–WOVEN GEOTEXTILE FABRIC) OVER THE EXISTING SURFACE.

WATER MANAGEMENT SYSTEM CONTAINMENT AREA 6

NOT TO SCALE

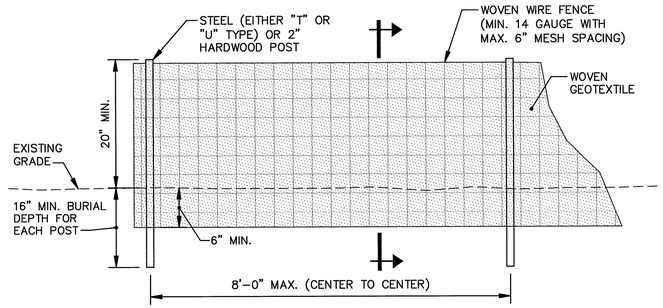


NOTES:

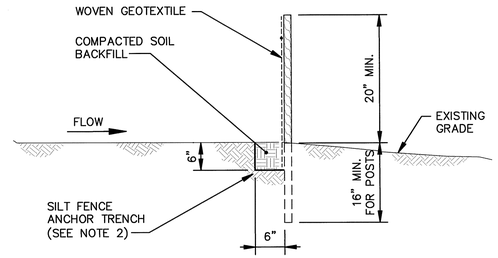
1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES, TOPOGRAPHY, AND PLANNED EQUIPMENT USE.
2. PLACEMENT OF FILL FOR ACCESS ROADS SHALL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.

ACCESS ROAD TYPICAL SECTION 4

NOT TO SCALE



PROFILE



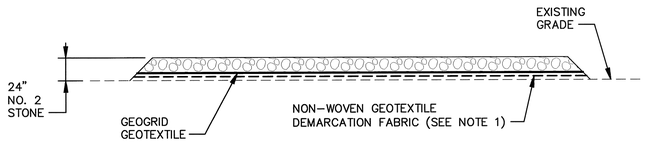
SECTION

NOTES:

1. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE OR AS DIRECTED BY CONSTRUCTION MANAGER.
2. THE SILT FENCE SHALL BE FOLDED INTO A TRENCH AND BACKFILLED.
3. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENTATION CONTROL.

REINFORCED SILT FENCE 3

NOT TO SCALE



NOTES:

1. NON–WOVEN GEOTEXTILE DEMARCATION FABRIC SHALL BE PLACED OVER THE EXISTING GROUND SURFACE.
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, TEMPORARY SURFACE COVER SYSTEM, INCLUDING NON–WOVEN GEOTEXTILE DEMARCATION FABRIC, SHALL BE REMOVED FOR OFFSITE DISPOSAL AT AN APPROVED AND LICENSED FACILITY.

TEMPORARY SURFACE COVER SYSTEM 5

NOT TO SCALE

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS, K.SARTORI PIC: J.BRIEN PM: TM: J.BALISTERI LYR:ON=*;OFF=*REF* G:\ENV\CAD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\43027G09.DWG LAYOUT: 9 SAVED: 5/22/2014 4:03 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:31 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
43027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 7/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK JASON DAVID BRIEN 084067 LICENSED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK
STORM SEWER REPLACEMENT

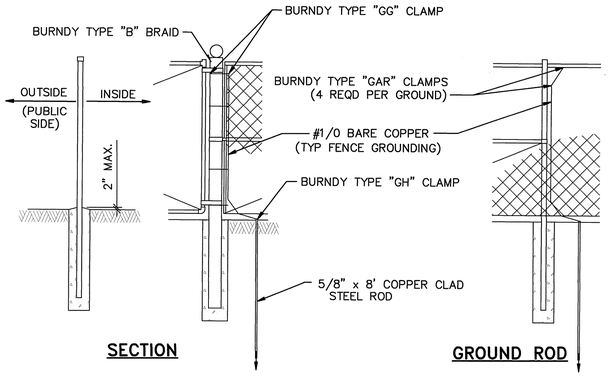
TYPICAL DETAILS

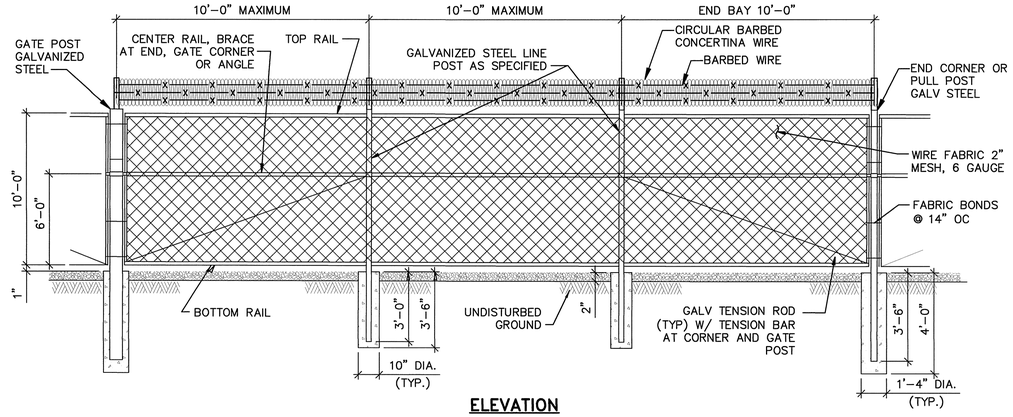
ARCADIS Project No.
B0043027.0005.00020

Date
SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

9





ELEVATION

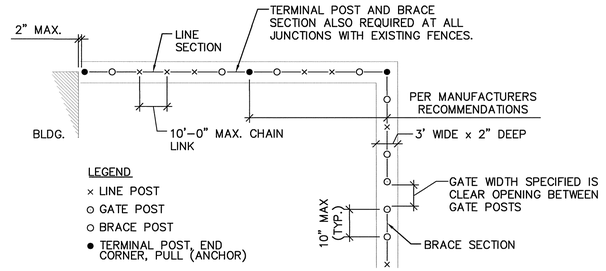
NOTES:

1. DIMENSIONS:
   ALL DIMENSIONS, SIZES GAUGES, WEIGHTS OR THICKNESSES SHOWN ARE THE MINIMUM ACCEPTABLE, UNLESS OTHERWISE INDICATED.

2. GROUND RODS, CHAIN LINK FENCE AND GATES ONLY: GROUND RODS SHALL BE INSTALLED AT 400' MAXIMUM INTERVALS, INCIDENTAL TO FENCE COST. EACH SECTION OF FENCE SEPARATED BY NON-METALLIC CONNECTORS, BUILDINGS OR OTHER OPENINGS SHALL HAVE A MINIMUM OF ONE GROUND ROD. EACH GATE LEAF FRAME SHALL BE CONNECTED TO THE GATE POST BY A BRAIDED FLEXIBLE COPPER STRAP. EACH GATE POST SHALL BE GROUNDED AS DETAILED. GROUND RODS SHALL BE 5/8"x8' MIN. SIZE, COPPER OR COPPER CLAD GROUND CABLE SHALL BE NO. 6 AWG. MIN. BARE STRANDED COPPER WIRE. FOR FENCES GROUNDING SHALL BE AS DETAILED. CONNECTIONS TO FENCE AND RODS SHALL BE MADE WITH SUITABLE NON-CORROSIVE METAL CLAMPS, LUGS OR CONNECTORS.

3. FENCE LINE AND ALIGNMENT:
   THE FENCE SHALL BE CONSTRUCTED VERTICAL, STRAIGHT AND TRUE TO THE LINE, THE LONGITUDINAL GRADIENT SHALL PARALLEL THE GENERAL SLOPE OF THE GROUND.

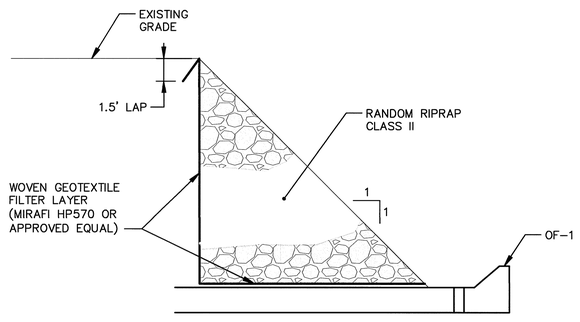
4. TEMPORARY SITE SECURITY FENCE POSTS WILL BE INSTALLED USING NON-INTRUSIVE METHODS (E.G., ANCHORED IN PRECAST CONCRETE BLOCKS OR PANEL STANDS) AND WILL NOT INCLUDE DRIVING POSTS INTO THE GROUND AND/OR SETTING POSTS INTO HOLES AND BACKFILLING THE HOLES.



TYPICAL FENCE LAYOUT

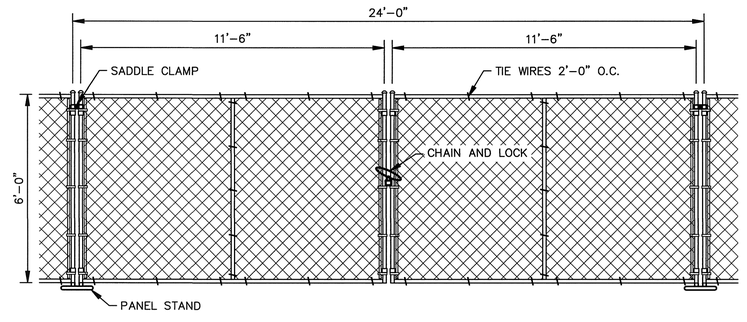
PERMANENT CHAIN LINK FENCE DETAIL 1

NOT TO SCALE



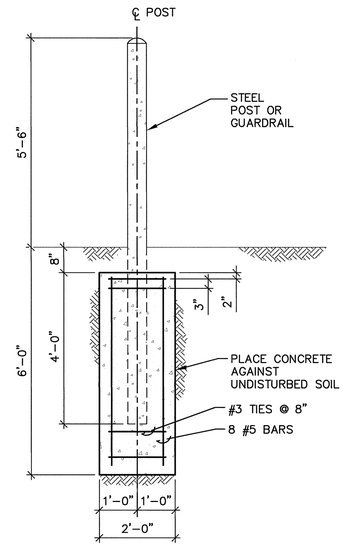
RIPRAP BANK DETAIL 2

NOT TO SCALE



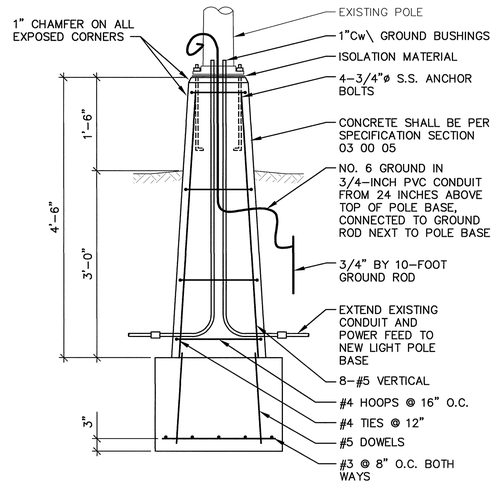
TEMPORARY ACCESS GATE 3

NOT TO SCALE



STEEL POST AND GUARDRAIL BASE DETAIL 4

NOT TO SCALE



EXTERIOR LIGHT POLE BASE DETAIL 5

NOT TO SCALE

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCADD\SYRACUSE\ACT\B0043027\0005\00020\DWG\CONTRACT\430270X10.DWG LAYOUT: 10 SAVED: 9/13/2014 8:14 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTCONT.CTB PLOTTED: 9/12/2014 10:32 AM BY: GETTS, BRIAN
XREFS:
IMAGES:
430027X00

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: JASON D. BRIEN		
Professional Engineer's No.: 084067		
State: NY	Date Signed: 9/15/14	Project Mgr.: MKH
Designed by: MAD	Drawn by: BGG	Checked by: JDB

STATE OF NEW YORK · JASON DAVID BRIEN · 084067 · PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. • HUNTS POINT FORMER MGP SITE - KRASDALE LEASEHOLD • BRONX, NEW YORK

STORM SEWER REPLACEMENT

RESTORATION DETAILS

ARCADIS Project No.	B0043027.0005.00020
Date	SEPTEMBER 2014

ARCADIS
6723 TOWPATH ROAD
P.O. BOX 66
SYRACUSE, NY 13214-0066
TEL. 315.446.9120

10

ARCADIS

Appendix C

Specifications

ARCADIS

Specifications

Section 01 04 60 – Control of Work

Section 01 11 00 – Summary of Work

Section 01 14 00 – Work Restrictions

Section 01 14 13 – Site Security and Access

Section 01 33 00 – Submittals

Section 01 35 43 – Environmental Protection

Section 01 50 00 – Temporary Facilities and Controls

Section 01 71 03 – Mobilization/Demobilization

Section 01 71 23 – Survey

Section 01 74 19 – Off-Site Disposal

Section 01 77 00 – Closeout Procedures

Section 01 78 39 – Construction and Record Drawings

Section 01 90 60 – Project Schedule

Section 02 41 00 – Demolition

Section 02 50 70 – Odor, Vapor, and Dust Control

Section 03 00 05 – Concrete

Section 26 05 05 – General Provisions for Electrical Systems

Section 31 05 19 – Geosynthetics

Section 31 23 00 – Excavation and Dewatering

Section 31 23 10 – Fill Materials

Section 31 25 13 – Erosion and Sedimentation Control

Section 31 50 00 – Excavation Support

Section 32 12 00 – Flexible Paving

Section 33 05 05 – Buried Pipe Installation

Section 33 05 14 – High Density Polyethylene (HDPE) Catch Basins

Section 40 05 33 – High Density Polyethylene (HDPE) Pipe

SECTION 01 04 60

CONTROL OF WORK

PART 1 – GENERAL

1.1 LAND AVAILABLE TO CONTRACTOR

A. Owner will arrange for/coordinate access to the Project Construction Area (i.e., Area for Contractor Use and Project Work Area).

B. The Contractor shall confine its operations to the Project Construction Area as shown on the Design Drawings.

C. All work shall be conducted in such manner as will cause the minimum inconvenience and disturbance to the site. No excavated materials or supplies of any kind shall be stored on properties not owned by the Owner or public premises without prior approval from the Owner/-Oversight Engineer.

D. The Contractor shall erect new and/or maintain existing fences along the roadways and grounds surrounding the Project Construction Area.

1.2 PROTECTION OF EXISTING STRUCTURES

A. The Contractor shall erect and maintain fencing or other provisions around the Project Construction Area in such a way as to deter unwanted/unknowing access to the Project Construction Area.

B. Unless otherwise stated in the Contract Documents, the Contractor shall protect from damage any and all pipelines, monitoring wells, pavements, sidewalks, curbs, buildings, trees, poles, drainage features, utilities, and other property in the vicinity of the Project Construction Area.

C. The Contractor shall be responsible for damage sustained by any structure due to project activities, including settlement of excavation or settlement or lateral movement of the sides of such areas, whether such movement occurs during or after excavation or backfilling of such excavations.

D. The Contractor shall have available on-site equipment and suitable and sufficient material for sustaining and supporting any and all such structures that are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

E. In case damage occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, the Contractor shall immediately notify the Owner and Oversight Engineer and proceed with appropriate and safe response actions, such as: remove such damage; collect, containerize, characterize, appropriately dispose of materials released from pipeline or structure; provide provisions for alternate service (e.g., bypass pumping); and furnish such material and perform such work of repairs or replacements. In the case of utilities, the Contractor shall immediately notify the utility company and provide assistance to the utility company during repairs unless authorized to undertake such repairs directly by the utility company. Any damage shall be promptly, completely, and satisfactorily repaired by the Contractor to the satisfaction of the Owner and/or the utility company at no additional cost to the Owner.

1.3 EXISTING SUBSURFACE STRUCTURES

A. General

1. Certain existing subsurface structures, which may be encountered during the performance of the Project or located in close proximity to the Project Construction Area will require special precautions and methods for their protection. Items such as sewer lines, water mains, and conduits that are known to the Owner, together with appurtenances, are shown on the Design Drawings. The sizes, locations, alignment, and depths shown are approximate and require verification by the Contractor.
2. Certain subsurface structures (e.g., pipe lines) related to former (historic) operations may also be encountered during the performance of the Project. Where encountered, the Contractor shall consult with the Owner and the Oversight Engineer regarding the need for and scope of activities necessary to remove, protect, or otherwise address such structures to accommodate the remedial action. In the event that free liquids are encountered within such structures, the Contractor shall collect and appropriately containerize such materials to the satisfaction of the Oversight Engineer. The Oversight Engineer will collect characterization samples and coordinate transportation and disposal of the materials.
3. Contractor shall recognize that subsurface structures and facilities may be located within the Project Construction Area that are either not identified or not accurately shown on the Design Drawings. It is the obligation of the Contractor to verify the accuracy and completeness of the information shown on the Design Drawings, as necessary to support the Project, and the Contractor agrees that it shall neither have nor assert against the Owner any claim for damages by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of Owner.
4. Where any existing subsurface structure such as a sewer line, drain line, gas line, water line, conduit, or other structure is found that is not anticipated or that is found to be materially different in size, location, or depth from that

anticipated by the IRMWP, the Contractor shall immediately notify the Oversight Engineer and Owner.

5. Contractor shall use due care to avoid damage to subsurface facilities identified, not identified, or inaccurately depicted on the Design Drawings.
6. Where the size, location, or depth of the existing subsurface structure has been anticipated and the IRMWP specifies removal, realignment, or change, all work shall be completed by the Contractor in mutual cooperation with the utility or other parties concerned.
7. Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the IRMWP, any work by the Contractor required to remove, realign, or change the structure shall be reviewed and agreed upon by the Contractor, Oversight Engineer, Owner, and utility or other parties concerned.

B. Utilities

1. Certain existing subsurface utilities (e.g., natural gas lines, sanitary/storm sewers, water mains, etc.), which may be encountered during the work or are located in close proximity to the Project Construction Area, will require special precautions and methods for their protection. Subsurface utilities that are known to the Owner, together with appurtenances, are shown on the Design Drawings. The sizes, locations, alignments, and depths shown (if any) are approximate and require verification by the Contractor.
2. All utilities whose facilities may be affected by the work shall be notified by the Contractor at least 72 hours in advance of the start of any operations that might affect such facilities.
3. The removal, replacement, support, or other handling of active private and public utilities within the Project Construction Area shall be performed by the Contractor in accordance with arrangements satisfactory to the Owner or operator of the utility involved. The Contractor shall remove, replace, or support all utilities as required.
4. Where it is necessary (as agreed to by the Owner, Oversight Engineer, and NYSDEC) to interrupt natural gas, sewer, water, or other utility service to remove, realign, or change a subsurface structure, the work shall: 1) be coordinated with the Owner, Oversight Engineer r, and appropriate utility company in a timely manner as not to delay construction activities; 2) proceed with expedience; and 3) be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.
5. The Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company in protecting its poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Contractor shall allow said individual, department, corporation, or company to take all such measures as they may deem prudent to protect their structures.

C. Existing Subsurface Structures that Require Changes in Project

1. The Owner and Oversight Engineer will determine whether changes should be made to the design to avoid a subsurface structure, whether the Project can proceed without changes to the design, or whether the structure should be removed, realigned, or changed.
2. Any increase or decrease in cost of the Project resulting from any changes in the design necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be prepared by the Contractor for review by the Owner.

1.4 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent unwanted/unknowing access, accidents to persons, and damage to property. Such measures shall be implemented pursuant to the applicable regulations. The length or size of excavation will be controlled by the particular surrounding conditions.

1.5 REPLACEMENT OF PROPERTY

A. The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Project. In all cases said replacement shall be new and to the satisfaction of the property owner. Vegetative restoration requirements are excluded from Parcel D.

1.6 HOUSEKEEPING

A. As the Project progresses, the Contractor shall remove all unused materials, tools, equipment and machinery, waste materials, rubbish, refuse, and other debris from the site in a timely manner and ensure that the site is at all times maintained in a neat and orderly condition.

B. At the completion of the Project, the Contractor shall promptly remove all construction tools, equipment and machinery, surplus materials, waste materials, rubbish, refuse, and other debris from the site and leave the site in a neat and orderly condition.

C. If it is observed that the Contractor neglects his responsibilities as set forth above, or neglects the repairing of streets, roadways, passageways or areas, or the repairing of fences or damages, the Owner or Oversight Engineer will give notice to that effect to the Contractor. If the Contractor does not take reasonable steps upon receipt of such notice to correct the neglected situation, the Owner may do so, and the expense thereby incurred shall be deducted from any monies due or that may become due to the Contractor.

- END OF SECTION -

SECTION 01 11 00

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This section provides a summary of the scope of Work to be performed in accordance with the Design Drawings, Specifications, Interim Remedial Measure Work Plan and supporting documents (herein referred to as "Contract Documents").

B. The Contractor is subject to requirements of local, state and federal agencies for the Work. Details pertaining to jurisdictional requirements governing the Work that are not specifically mentioned in the Contract Documents shall not relieve the Contractor's obligation to comply with applicable requirements.

1.2 SUBMITTALS

A. The Contractor shall submit submittals in accordance with Table 01 33 00-1 – Submittal Register.

1.4 DEFINITIONS

A. Area for Contractor Use – Area on existing Parcel D located north of the Krasdale Leasehold Property that will be used for by the Contractor for construction support.

B. Bidder – One who submits a Bid directly to the Owner as distinct from a Sub-bidder, who submits a bid to a Bidder.

C. Design Engineer – The Company contracted by the Owner to act on the Owner's behalf to complete Work described in the Contract Documents. The Design Engineer is responsible for managing the project, Owner interactions and acting as Engineer of Record.

D. Contract Documents – The Contract Documents consist of the Design Drawings, Specifications, Interim Remedial Measure Work Plan, and all supporting plans.

E. Contractor – The Company contracted by the Owner to perform the Work described in these Contract Documents.

F. Design Drawings – The Design Drawings that show the scope, extent and character of the work to be furnished and performed by Contractor and which have been prepared or approved by the Design Engineer and are included within or referred to in the Contract Documents. Shop Drawings are not Design Drawings as so defined.

G. HASP – The Site-Specific Health and Safety Plan prepared by the Contractor.

H. Non-Conforming – An adjective, which when modifying the Work, refers to work that is unsatisfactory, faulty or deficient, in that it does not meet the requirements of a specified inspection, reference standard, test, approval or performance requirement referred to in the Specifications or Design Drawings, or has been damaged prior to the Design Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by the Design Engineer at Substantial Completion).

I. Normal Work Hours – The hours during which the Contractor may perform the work as defined in the Specifications.

J. NYC EDC – New York City Economic Development Corporation.

J. NYSDEC – New York State Department of Environmental Conservation.

K. Oversight Engineer– The Design Engineer's on-site representative.

L. Owner – Consolidated Edison Company of New York, Inc.

M. PPE – Personal Protective Equipment

N. Project Construction Area – Area encompassing the Project Work Area and Area for Contractor Use.

O. Project Work Area – Area that encompasses that required to replace the subject storm sewer.

P. IRMWP – Interim Remedial Measure Work Plan

Q. Supplier – A manufacturer, fabricator, distributor, material man or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the work by Contractor or any Subcontractor.

R. Work – The entire completed construction and the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, performing or furnishing services or transportation, performing treatment and furnishing documents, all as required by the Contract Documents.

1.5 ORGANIZATION AND INTERPRETATION OF CONTRACT DOCUMENTS

A. The Contract Documents establish design components location and layout, Contractor performance and quality requirements, and general arrangement of materials and equipment, as well as the minimum standards for quality of workmanship and appearance.

B. Questions concerning the applicability or interpretation of a particular section or part of any Contract Document shall be directed to the Design Engineer.

C. For the finished work, include all necessary materials required to make each installation satisfactory and operable for its intended purpose, even though some items may not be specifically depicted on the Design Drawings. The Contractor shall inform the Oversight Engineer of the type and quantity of the material that the Contractor deems necessary and prudent to make each installation satisfactory and operable before the material is brought to the site.

D. Work that is deemed necessary by the Contractor, or required by the Oversight Engineer to make each installation satisfactory and operable for its intended purpose, even though it is not specifically included in the Specification or on the Design Drawings, shall be performed as incidental work as if it were described in the Specification and shown on the Design Drawings.

1.6 PROJECT IDENTIFICATION

A. The Work included in these Specifications is for the Storm Sewer Replacement Project at the Krasdale Leasehold Property on the Hunts Point Former Manufactured Gas Plant Site. These Specifications provide the performance criteria that the selected Contractor must meet to complete the project. These specifications are intended for use in conjunction with the Design Drawings that form a part of the Contract Documents developed for the project.

B. The Work comprises soil excavation, in connection with the replacement of an existing storm sewer pipe system with an HDPE storm sewer system, backfill and site restoration. The Contractor shall provide all labor, equipment, material and services required to conduct the construction activities consistent with the Contract Documents, including but not limited to, those activities identified in 1.9 of this Section.

C. The overall project objectives are as follows:
   1. To excavate and transport soil materials and debris from within the Project Work Area to an appropriately licensed and permitted disposal facility capable of receiving the material.
   2. To replace the existing storm sewer system with an equivalent HDPE system as shown on the Design Drawings.
   3. To place controlled low strength material as specified in the Specifications to the limits and grades shown in the Design Drawings.
   4. To verify that all specified grades have been achieved within allowable tolerances and to the satisfaction of the Oversight Engineer.

D. Activities discussed in these Specifications shall be included in the Site-Specific Health and Safety Plan (HASP) prepared by the Contractor and reviewed by the Design Engineer.

1.7 CONTRACTOR USE OF SITE AND PREMISES

A. Access to Site and Work Area. Limit operations at the site to the Project Construction Area as shown on the Design Drawings, unless otherwise approved by the Oversight Engineer for specific instances to be reviewed on a case-by-case basis. Areas of the site beyond the Project Work Limits as indicated on the Design Drawings shall not be disturbed.

B. Construction Operations. Confine operations at the site to the designated areas and do not interfere with other site operations.

C. Utility Clearance. The Contractor shall be responsible for coordination of utilities, including locating all subsurface utilities before excavations, and repairing any utility damaged as a result of the Work. The Contractor shall contact Dig Safely New York, all other utility companies not contacted by Dig Safely New York, as well as the Owner, 72 hours prior to initiating excavation activities.

1.8 ON-SITE OBSERVATION OF WORK

A. Oversight Engineer: The Oversight Engineer will observe the progress and quality of the Work and determine if the Work is proceeding in substantial compliance with the Contract Documents. The Oversight Engineer will inform the Owner and the Design Engineer as to the progress of the Work and possible defects and deficiencies in the Work. The Oversight Engineer may disapprove Work as failing to conform to the Contract Documents. Whenever the Oversight Engineer considers it necessary or advisable to properly carry out the intent of the Contract, the Oversight Engineer (on behalf of the Owner) can request the Contractor to make special examination or testing of the Work (whether or not fabricated, installed or completed).

B. The Oversight Engineer's duties, services and work shall in no way supersede or affect the Contractor's obligation to perform the Work. The Oversight Engineer is empowered to act on the Owner's behalf with respect to the proper execution of the Work and to give instructions when necessary to require such corrective measures as may be necessary in the Oversight Engineer's professional opinion to protect the Owner's interest.

1.9 SUMMARY OF WORK

A. The work to be performed for this project is shown on the Design Drawings and described in these Specifications. The primary objective of the Hunts Point Former Manufactured Gas Pant project involves the replacement of an existing concrete storm sewer and related activities at the Hunts Point site in Bronx, NY. The work to be performed by the Contractor includes, but is not necessarily limited to, the following activities:

1. Project Management, Permits and Administration
   a) Perform project management and administration.
   b) Prepare and submit Contractor work plan and other required submittals.
   c) Apply for and obtain all local permits necessary to perform the Work.
   d) Conduct daily H&S meetings.
   e) Prepare and implement a Contractor HASP meeting applicable regulatory requirements.
   f) Attend project-related meetings.
   g) Prepare and submit daily construction reports.

2. Mobilization

a) Mobilize necessary personnel, equipment, materials to the site. This includes, but is not limited to, field office trailers, office equipment, portable sanitary facilities, and traffic barriers and signage.

3. Site Preparation, Maintenance and Security
   a) Locate, stake and clear utilities.
   b) Construct site access from Food Center Drive and install stabilized construction entrance.
   c) Construct or install site controls and temporary facilities (e.g., temporary access roads, equipment staging and storage areas, temporary surface cover, field office trailers, utilities, sanitary services, erosion and sedimentation controls, decontamination area and temporary fencing).
   d) Protect existing Site features (e.g., overhead/underground utilities, culverts, railroads).
   e) Provide ongoing site cleanup, trash disposal, provisions for spill containment and control.
   f) Establish and maintain containment facilities for construction vehicle fueling.
   g) Install electrical connections and/or generators to supply power to site facilities.
   h) Install temporary erosion and sedimentation controls, as required.
   i) Remove, transport, and dispose of surface coverings and miscellaneous debris that currently exist on the property.
   j) Maintain and clean site entrance/exits and street sweeping of adjacent public roadways.
   k) Remove and recycle or disposal of vegetation and shrubs.
   l) Provide security measures (i.e., fencing, signage), including a security guard during non-working hours including weekends and holidays as applicable.
   m) Install personnel gates for emergency exit.

4. Environmental Controls and Monitoring
   a) The Contractor shall install erosion and sedimentation control measures in accordance with Section 31 25 13 – Erosion and Sedimentation Control.
   b) Control and management of dust associated with the Work. The Contractor shall be prepared to implement dust control measures during all construction operations, as directed by the Oversight Engineer.
   c) Visual monitoring for dust generation.
   d) Implementation of noise control measures (e.g., sound insulated portable generators).
   e) Performing daily Site inspections pertaining to erosion and sedimentation controls.

5. Excavation, material handling, and transportation of soil and debris materials to off-site disposal facility
   a) Provide and coordinate required number of trucks at or near the site to facilitate off-site transport.
   b) Provide and maintain excavation support, as required.
   c) Excavation, segregation (as required), and handling of excavated materials and debris.
   d) Load excavated materials and debris into transport trucks and transporting of materials to an off-site disposal facility.

e) Control and manage water from the excavation area, staging area(s), wheel wash area(s), decontamination area(s) and other Site areas to prevent erosion, uncontrolled runoff, or direct discharge to surface water.

6. Surveying
   a) Establishing and maintaining Site survey control data and benchmarks.
   b) Performing pre-construction topographic survey to be conducted by Contractor's surveyor.
   c) Establishing and maintaining grade control for excavation, pipe installation, backfill, and restoration activities.
   d) Performing progress and record surveys of excavation, pipe installation, backfill, and restoration/final grade surfaces.
   e) Completing final topographic surveys to be conducted by Contractor's surveyor.
   f) Survey of lateral and vertical limits of excavations (after sediment removal) shall be performed for each removal area by the Contractor's surveyor and verified by Design Engineer at points specified in the Design Drawings before final certification.

7. Demobilization and Project Closeout
   a) Demobilization, including, but not limited to, removal of all temporary facilities installed at the site, restoration of areas, including the staging area, access routes, excavation support structures, temporary electrical supplies, and delivery of all final work documents and/or mark-ups to the Oversight Engineer.
   b) Contractor is responsible for disposal of all materials used to construct the temporary material staging area and temporary access roads at a licensed disposal facility.
   c) Restoration of existing on-site and off-site disturbed surfaces (e.g., vegetated areas, paved and graveled areas).
   d) Restoration of any existing utilities and Site features that may have been temporarily modified to allow for construction.
   e) Perform all project closeout activities.

8. The Contractor shall note that this summary is an overview only, and that all work specified in these Contract Documents shall be completed by the Contractor unless specifically stated otherwise.

1.10 CONSTRUCTION SCHEDULE

A. The Contractor shall submit within 7 days after Notice of Award, a detailed construction schedule in Gantt chart format (Microsoft Project preferred), showing all major work items to be completed, the assumed start date and duration of each work item, and the projected completion date for each activity.

1.11 CONSTRUCTION PERMITS

A. All required local permits and fees required for completion of the project shall be the responsibility of the Contractor, including but not limited to:
   1. New York City Buildings Department permits
   2. Any electrical connection permits

3. Any roadway transportation permits
4. Any environmental permits.

1.12 LAWS AND REGULATIONS

A. The Contractor shall at all times abide by all applicable federal and state laws, county and local ordinances, and rules and regulations of all other authorities having jurisdiction at the project location. Compliance with these laws, regulation, ordinances and rules shall apply throughout the contract duration, and applies to all agents, subcontractors, and employees of the Contractor.

1.13 INCIDENTAL CONSTRUCTION

A. The Contractor shall perform all work indicated or implied in the Contract Documents, including all work not specified but required to complete the project in a satisfactory manner. All items of work not listed in the Bid Items shall be considered as incidental work to the Contract and no additional compensation will be paid.

1.14 CHANGE ORDERS

A. All work described in the Contract Documents shall be included in the Contractor's Bid price, whether specified as a bid item on the Bid tables or not. The Contractor shall note added cost items on the Bid Form, together with the amount added.

B. For work items that are partially performed, or where a lesser quantity of material is utilized, a deduction will be made to the contract price based on the percent of work performed (if lump sum) or based on the unit rate if provided on the Bid tables.

C. The Contractor is required to provide total pricing at this time, as only unforeseen changes in quantities or a significant change in scope will be considered a basis for a change order.

1.15 QUALITY ASSURANCE

A. The Work will be considered complete when the final topographic survey of the Work has been completed to the vertical and horizontal limits shown on the Design Drawings (or as otherwise may be required by these Specifications), reviewed and approved by the Design Engineer.

1.16 EXISTING CONDITIONS

A. The location and existing conditions and features at the Work Area shown on the Design Drawings are approximate only and may have changed since acquisition of the Site information.

B. The Contractor is responsible for verifying the exact nature, character, quality, and quantity of all surface and subsurface conditions and features that exist and/or are likely to be encountered at the site. Any reliance upon the Design Drawings and information made available by the Design Engineer shall be at the Contractor's risk.

C. All holders of Contract Documents will be permitted to inspect the site of the work during the Bid Walk. It should be understood that the party or parties inspecting the site must assume all risks and liabilities contingent thereto.

D. The Contractor agrees that he/she shall neither have nor assert against the Owner, or Design Engineer any claim for damages for extra work or otherwise or for relief from obligation of this Contract based upon the failure by Owner, or Design Engineer to obtain or to furnish additional drawings or information or to furnish all drawings and information in Owner's, or Design Engineer's possession or based on any inadequacy of the drawings or information provided.

1.17 HEALTH AND SAFETY

A. Health and safety protocols and the objective to conduct the work in a safe manner shall be considered paramount to the success of the project. Health and safety requirements of these specifications and the Contractor's HASP shall be adhered to at all times. Best management practices creating a safe work environment in a manner that supplements these requirements are strongly encouraged.

B. Contractor shall prepare a site-specific HASP that conforms with applicable regulations, including, at a minimum, 29 Code of Federal Regulations (CFR) 1926.

C. Contractor shall submit HASP to Owner and Design Engineer at least 30 days prior to mobilization. The Owner or Design Engineer shall submit the HASP to NYSDEC and New York State Department of Health (NYSDOH) for review at least 14 days prior to mobilization.

D. Contractor shall provide health and safety materials and equipment as required by the HASP.

E. Contractor shall assign a full-time Safety Officer to oversee project health and safety responsibilities.

F. Health and safety materials and equipment required for the Contractor's employees shall be provided by the Contractor.

G. Contractor shall conduct daily site safety meetings and document results to be submitted with daily reports. Safety meetings shall be also conducted when conditions change. The Oversight Engineer will be included in the site safety meetings.

H. Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

1.18 DAILY REPORTS

A. The Contractor shall submit daily reports to the Oversight Engineer summarizing the work completed that day, weather conditions, health and safety issues, progress relative to schedule, the completed Erosion and Sedimentation Control Inspection Form required

in Section 31 25 13 of these specifications, and other project-related issues. Contractor shall include any requests for information or clarification needed from the Oversight Engineer in the daily report.

1.19 PRE-CONSTRUCTION AND PROGRESS MEETINGS

A. Prior to the start of construction by the successful Bidder, a pre-construction meeting shall be held with the Owner, Oversight Engineer, the Design Engineer, and the Contractor in attendance, at a minimum. The meeting shall include introductions to key Contractor personnel that will be present on site (such as the Construction Superintendent or Design Engineer) and discussion of general features of the project and the various requirements of the Contract. Notes of this meeting will be taken by the Oversight Engineer and distributed to all within three days following the meeting.

B. Progress meetings shall be conducted weekly, at a minimum, to discuss site safety, the progress of the work relative to the project schedule, work scheduled for the upcoming week, and other issues to be addressed. These meetings shall be attended by the Contractor, the Oversight Engineer, and by any subcontractors present on site, at a minimum. These meetings may also be attended by the Owner, Design Engineer, the NYSDEC, NYCEDC, and other local government representatives. Notes of the meetings will be distributed to all parties in attendance by the Oversight Engineer. Any deletions or omissions to the meeting notes shall be brought to the attention of the Oversight Engineer and a correction to the notes issued, if appropriate.

1.20 CONTRACT WORK LIMITS AND SECURITY

A. Unless directed otherwise by Oversight Engineer, work limits are depicted on the Design Drawings. The Contractor shall restrict all work activities including, but not limited to, storage of equipment and materials to be incorporated into the project, temporary office and sanitary facilities, etc. to the working limits shown on the Design Drawings. Security for the site shall be provided by the Contractor in accordance with Section 01 50 00 – Temporary Facilities and Controls.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

- END OF SECTION -

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Allowable work days/hours.

B. Access to the Site.

C. Weather restrictions.

D. Work Area.

1.2 ALLOWABLE WORK DAYS/HOURS

A. The Contractor shall assume work is performed during the hours of 7:00 a.m. and 6:00 p.m., on non-holiday weekdays (i.e., Monday through Friday), and no work on weekends. It is the Contractor's responsibility to conform or modify work activities in accordance with any and all state and local ordinances and regulations. Work outside of these hours must be approved in advance by written permission from the Departments of Buildings and Transportation with a noise mitigation plan in place prior to authorization.

B. Adequate lighting and all other necessary facilities, including adjusting noise levels, for carrying out and inspecting the work shall be provided and maintained by the Contractor in all areas where work will be performed during non- daylight areas to allow for the safe and complete performance and inspection of the Work and shall comply with all local, state and federal regulations.

C. The Contractor will provide, install, operate, maintain, move, and remove portable lights and equipment-mounted lighting fixtures for construction operations occurring more than 30 minutes after sunset and more than 30 minutes before sunrise and during periods of restricted visibility. The Contractor will immediately repair any non-functioning light and will perform a check of all lights at the start of each work shift that requires lighting. Lighting shall be placed such that it properly illuminates the Project Construction Area while complying with state and local ordinances and regulations and minimizing impacts to adjacent residences.

1.3 ACCESS

A. The Contractor shall adhere to the access routes identified on the Design Drawings.

B. The Contractor shall observe all applicable traffic laws and Department of Transportation requirements. At the Site, the Contractor will observe a speed limit of 10 miles per hour (mph).

C. All vehicles shall be parked within the Project Construction Area. The Contractor shall not park project and personnel vehicles in areas that may impede the public right-of-way.

1.4 WEATHER RESTRICTIONS

A. The Contractor will suspend work in the following conditions:

1. Weather conditions that require evacuation from the Project Construction Area in accordance with the Contractor HASP such as lightning or high winds.
2. Bronx River water level rises to a level that threatens to inundate portions of the Project Construction Area.

1.5 WORK AREAS

A. The Contractor will limit work activities to the Project Construction Area shown on the Design Drawings. The limits of work generally include the area around the storm sewer, temporary access roads, office trailers, decontamination area, and material and equipment staging areas.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

- END OF SECTION -

SECTION 01 14 13

SITE SECURITY AND ACCESS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Work under this Section includes implementing measures at the site to provide for site security and to restrict access.

1.2 SUBMITTALS

A. Security Plan:
   1. As a sub-section of the Contractor's Operations Plan, the Contractor shall submit a written security plan. The plan shall include an inventory of equipment to be used and a schedule for construction of security measures to be implemented by the Contractor with respect to the Contractor's equipment and security responsibilities. At a minimum the plan shall include the following:
      a. Contractor procedures for securing all equipment and work areas when unattended within and outside the fenced perimeters. This includes locking cabs and removing keys when the equipment is not in use. Security mechanisms for various equipment and work areas include fencing, locks, signage and power supply.
      b. Reporting protocol for damaged, lost or vandalized equipment.
      c. Example of the Daily Sign-in Log for the site.
      d. Identify the individual in the Contractor's organization who will be responsible for maintaining the Daily Sign-in Log.

B. The Contractor shall maintain a daily log of workers and visitors to be submitted to the Oversight Engineer with the Daily Construction Report for each day of the Work.

1.3 RELATED DOCUMENTS

A. Section 01 14 00 – Work Restrictions

B. Section 01 50 00 – Temporary Facilities and Controls

1.4 SECURITY MEASURES

A. Only personnel in the employment of the Owner or its Contractors, Subcontractors, Suppliers, NYSDEC, New York City Economic Development Corporation (NYC EDC), New York City Buildings Department (NYCBD) and their respective representatives shall be allowed within the Project Construction

Area. No other personnel are allowed without the express written approval of Con Edison.

B. Authorized vehicles and personnel may enter the site at Food Center Drive in accordance with Section 01 14 00 – Work Restrictions and Section 01 50 00 – Temporary Facilities and Controls.

1.5 CONTRACTOR RESPONSIBILITIES

A. The Contractor is responsible for constructing temporary fences, gates, booths and other security measures as well as providing security personnel as specified in this section.
   1. A temporary security fence with an access gate(s) will be installed around the perimeter of the Project Construction Area including, but not limited to the office trailers, access road, and material and equipment staging areas. One access gate will be installed to permit equipment access to the work limits. Security fencing shall be galvanized chain link fence installed in accordance with paragraph 2.1 below and as shown on the Design Drawings. The portion of the Project Construction Area adjacent to the Krasdale Property will receive a construction barrier. The construction barrier shall consist of concrete jersey barriers equipped with drainage cutouts. Privacy screen material shall be fastened to all security fencing in accordance with paragraph 2.2 below.
   2. Two personnel-gates shall be installed at the eastern end of the construction work limits to provide a means of secondary egress in the event of an emergency.
   3. Safety/construction fencing (e.g., plastic snow fence) shall be installed around any sections of open excavation.
   4. Temporary security and construction fence shall be tied into existing fence, where applicable.
   5. Installation of permanent fencing shall be in accordance with Paragraph 2.4 below and as shown on the Design Drawings.

B. Temporary site controls will be removed following completion of the Work. Any disturbance resulting from the construction of temporary controls shall be restored in-kind.

C. The Contractor will maintain the security program throughout construction until the Oversight Engineer's final acceptance of work precludes the need for the Contractor's security program.

D. The Contractor's health and safety personnel shall be present during the Work.

E. The Contractor shall restrict access of persons and vehicles onto the site. The Contractor shall allow only authorized persons to enter the site.

F. Prior to the start of Work, the Contractor's personnel must participate in site-specific orientation/training conducted by the Contractor.

G. The Contractor shall be solely responsible for security of materials, property and tools and equipment from loss, theft, damage and vandalism. All materials, tools and equipment shall be kept locked by the Contractor when not in use. The Contractor shall repair all damage to property of the Owner and others arising from failure to provide adequate security, at no additional cost to the Owner.

H. If existing fencing or barriers are breached or removed for construction, the Contractor shall provide and maintain temporary security fencing equal to the existing in a manner satisfactory to the Owner.

I. The Contractor shall report any theft or vandalism to Oversight Engineer and document the incident in the Daily Construction Report. Required details include who, what, where, when, why and corrective measures implemented to prevent future occurrences. The Contractor shall make no claim against the Owner or adjacent property owner(s) for damage, due to Contractor negligence, resulting from trespass and shall replace/repair damage at no additional cost to the Owner. If Contractor personnel encounter trespassers, they shall notify the Oversight Engineer.

PART 2 – PRODUCTS

2.1 TEMPORARY GALVANIZED CHAINLINK FENCE

A. Structural and roll-formed shapes may be used in lieu of pipe sections. The structural or roll-formed shapes shall have a bending strength greater than the pipe section when measured under a 6-foot cantilever load.

B. Posts, rails and braces:
   1. Schedule 40.
   2. dimensions and weights (minimum):

	Outside Dia. (Inches)	Weight (lbs)/ Feet
End, Corner and Pull Posts	2.875	5.79
Line Posts (Heavy Duty)	2.375	3.65
Top Rails and Braces	1.66	2.27
Gate Posts:		
Leaves 6 feet wide or less	2.875	5.79
Leaves over 6 feet, including 13 feet wide	4.00	9.11

C. Chainlink fabric:
   1. One piece of 9-gauge steel wire fabric; 2-inch mesh twisted and barbed at the top and bottom.
   2. 6 feet high when installed.

D. Gates:
   1. Gate type shall be of the swing type.
   2. Welded fabrication shall be of not less than 2-inch O.D. Schedule 40 steel pipe.
   3. Braces and minimum ¾-inch-diameter trusses to provide rigidity without sag or twist. Locking devices, latches, stops and other hardware as required for a complete operating gate.
      a. Operate from either side.
      b. Use a high-security padlock. The padlock shall be rust-proofed and shall be furnished with six like keys. Padlock shall be as manufactured by Master Lock Company or equivalent.
   4. Fabric of gates shall be the same as chainlink fence.

E. Miscellaneous:
   1. Based on soil conditions, posts shall be anchored in precast concrete blocks or panel stands placed on the ground surface. Panel stands may be weighted with sand bags to provide stability, as necessary. Temporary site security fence posts will be installed using non-intrusive methods and will not include driving posts into the ground and/or setting posts into holes and backfilling the holes.
   2. Wire ties or clips shall be a minimum of 6 gauge.
      a. Hog rings may be used to tie fabric to tension wire.

2.2 TEMPORARY VISUAL BARRIER

A. Construction fence screen fabric
   1. Shall consist of CiFabrics Economy Envirotex or approved equivalent.
   2. Fabric roll height shall be 5’8”.

B. Fastening
   1. Wire ties or clips shall be a minimum of 6 gauge.
      a. Hog rings may be used to tie fabric to temporary construction fence fabric wire.

2.3 TEMPORARY CONSTRUCTION BARRIER

A. Blocks
   1. Shall consist of concrete Jersey Barriers.
   2. Jersey barriers shall measure 96”L x 27”W x 32”H.

2.4 PERMANENT GALVANIZED CHAINLINK FENCE

A. Structural and roll-formed shapes may be used in lieu of pipe sections. The structural or roll-formed shapes shall have a bending strength greater than the pipe section when measured under a 6-foot cantilever load.

B. Posts, rails and braces:
   1. Schedule 40.
   2. dimensions and weights (minimum):

	Outside Dia. (Inches)	Weight (lbs)/ Feet
End, Corner and Pull Posts	3.50	7.58
Line Posts (Heavy Duty)	3.50	7.58
Top Rails and Braces	1.90	2.72
Center Rails	1.66	2.27
Bottom Rails	1.66	2.27
Gate Posts:		
Leaves 6 feet wide or less	2.875	5.79
Leaves over 6 feet, including 13 feet wide	4.00	9.11

C. Chainlink fabric:
   1. One piece of 6-gauge steel wire fabric; 2-inch mesh twisted and barbed at the top. Knuckle selvage at bottom.
   2. 10 feet high when installed.

D. Gates:
   1. Gate type shall be of the swing type.
   2. Welded fabrication shall be of not less than 2-inch O.D. Schedule 40 steel pipe.
   3. Braces and minimum ¾-inch-diameter trusses to provide rigidity without sag or twist. Locking devices, latches, stops and other hardware as required for a complete operating gate.
      a. Operate from either side.
      b. Use a high-security padlock. The padlock shall be rust-proofed and shall be furnished with six like keys. Padlock shall be as manufactured by Master Lock Company or equivalent.
   4. Fabric of gates shall be the same as chainlink fence.

E. Miscellaneous:
   1. Cast-in-Place Concrete Foundations: Class B in accordance with Section 03 00 05 – Concrete.
   2. Wire ties or clips shall be a minimum of 6 gauge.
   3. Remount all signs on Permanent galvanized fencing to match preconstruction conditions or as directed by Owner or Oversight Engineer.
   4. Barbed Wire Support Arms: Pressed steel for three rows of barbed wire attached to each arm. Supporting arms shall be integral with post-top weather cap. Supporting arms shall be single 45-degree, one for each post.
   5. Barbed Wire: Commercial quality steel, two-strand, 11 gage line wire with 14 gage, four-point twisted aluminum alloy barbs spaced five inches on centers. Commercial quality steel, circular concertina barbed wire to wrap three strands of straight barbed wire.

PART 3 – EXECUTION

3.1 PROJECT SIGN

A. Warning signs shall be posted at all entrance gates. Signs shall read "CONSTRUCTION SITE UNAUTHORIZED ENTRANCE IS PROHIBITED" with black lettering on a white surface. Signs shall be rectangular in shape with a minimum dimension of two square feet and not more than three square feet. Signs shall be securely attached to the fencing, maintained during construction and removed upon project completion.

B. Maintenance:
   1. The Contractor shall provide any and all patching, painting, lettering, and bracing required to maintain the sign in good condition throughout the course of the Work.

C. Closure:
   1. The signs are to remain on site until Work completion, and notification from the Oversight Engineer. At that time the sign is to be dismantled and shall become the Contractor's property.

- END OF SECTION -

SECTION 01 33 00

SUBMITTALS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Work under this section includes submittals due from the Contractor as specified herein, in the Specifications, Design Drawings and Request for Proposal. This section discusses the following items: Submittal Procedures, Approval Time of Submittals, Work Plans, Survey/Layout Data, Engineering Data, Progress Reports, Construction Drawings, Final Record Drawings and Submittal Register.

1.2 SUBMITTALS

A. Submittals listed below are described in individual Specifications. Refer to individual specifications for additional information.
   1. Contractor's Operations Plan in accordance with the Technical Specifications that shall address, but not be limited to, the following items:
      a. Security Plan – Prepare a written explanation of the security measures planned for the Work in accordance with Section 01 14 13. – Site Security and Access Part 1.2.
      b. Environmental Protection – Prepare an Environmental Protection Plan in accordance with Section 01 35 43 - Environmental Protection Plan.
      c. Temporary Facilities Plan – Prepare a Temporary Facilities Plan in accordance with Section 01 50 00 – Temporary Facilities and Controls Part 1.2.
      d. Project Schedule – Provide a detailed written explanation of the specific activities included in the Construction Schedule required by Section 01 90 60 – Mobilization/Demobilization Part 1.2, including identification of key sequencing and critical path issues.
      e. Topographic Survey Plan – Prepare a Topographic Survey Plan in accordance with Section 01 71 23 –Surveying Part 1.2.
      f. Off-Site Disposal Plan – Prepare an Off-Site Disposal Plan in accordance with Section 01 74 19 – Off-Site Disposal Part 1.2.
      g. Demolition and Removal Plan – Prepare a Demolition and Removal Plan in accordance with Section 02 41 00 – Demolition Part 1.3.
      h. Excavation Plan – Prepare an Excavation Plan in accordance with Section 31 23 00 – Excavation Part 1.2.
      i. Erosion and Sedimentation Control Plan – Prepare a Erosion and Sedimentation Control Plan in accordance with Section 31 25 13 – Erosion and Sedimentation Control Part 1.2.
   2. Contractor's Health and Safety Plan
   3. Construction Schedule
   4. Pre-Construction Survey

5. Post-Construction Survey
6. Survey Records
7. Spill Response Report
8. Pre-Construction Waste Characterization Samples and Related Documentation, in the event a disposal facility require analyses above and beyond those sampled previously by ARCADIS.
9. Construction Drawings in accordance with Section 01 78 39 – Construction and Record Drawings Part 1.2
10. Daily Construction Report
11. Weekly Construction Report, including Construction Progress Schedule
12. Off-Site Disposal Report
13. Copies of Material Shipping Records
14. Misplaced Material Report
15. Final Truck Volume Counts and Measurement Summary Tables

1.3 RELATED DOCUMENTS

A. Section 01 71 23 – Survey

B. Section 01 71 03 – Mobilization/Demobilization

C. Section 01 78 39 – Construction and Record Drawings

D. Section 01 14 13 – Site Security and Access

E. Section 01 74 19 – Off-Site Disposal

F. Section 31 25 13 – Erosion and Sedimentation Control

G. Section 31 50 50 – Excavation Support

H. Section 31 23 00 – Excavation and Dewatering

1.4 SUBMITTAL PROCEDURES

A. All submittals regardless of origin shall be provided to the Design Engineer unless otherwise noted in accordance with this Section. The appropriate address and receiver of submittals will be designated at the pre-construction meeting be held following the Notice to Award. The Contractor shall direct inquiries to the Design Engineer regarding the procedure, purpose, or extent of any submittal if clarifications are required prior to submittal to avoid delays in approval.

B. Submittals shall be in Microsoft Office compatible format. A transmittal letter shall accompany all submittals. The transmittal letter shall indicate:
   1. description and purpose of submittal, date and sequential submittal number
   2. section and paragraph with which the item complies

3. type of submittal (e.g., Manufacturer's Data, Shop Drawing, Sample, Record Drawing)
4. name and telephone number of the person to whom any questions can be directed
5. any deviations from the Contract Documents

C. All submittals, regardless of origin, shall be stamped with the approval of the Contractor and identified with the project name and number, Contractor's name, and references to applicable Specifications, Contract Documents and Contractor submittal number. When catalog pages are submitted, applicable items shall be clearly identified in a way that is reproducible using a copier or scanner. The current revision, issue number and date shall be indicated on all drawings and any other necessary descriptive data.

D. Submittals shall be consecutively numbered in direct sequence of submittal and without division by subcontracts or trades. The submittal number should appear within or next to the Contractor stamp. Resubmittals shall bear the number of the first submittal followed by a letter (e.g., A, B) to indicate the sequence of the resubmittal.

E. Multiple submittals shall be sufficiently separated and bundled such that the end of one submittal and the start of another is clearly discernible. Staples, rubber bands, paper clips or tab dividers are acceptable.

F. An electronic copy (pdf) of each submittal and necessary data shall be submitted to the Design Engineer. The Design Engineer will not accept submittals from anyone but the Contractor.

G. The Contractor's stamp of approval is representation to the Design Engineer that the Contractor accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data, and that he has reviewed or coordinated each submittal with the requirements of the work and the Contract Documents. Approval of a submittal by the Design Engineer does not relieve the Contractor of responsibility for correcting errors which may exist in a submittal or from meeting requirements of the Contract Documents.

H. All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in the Contractor's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by the Contractor (including modifications to other facilities that may be a result of the deviation).

I. The Contractor shall accept full responsibility for the completeness of each submission, and, in the case of a resubmission, shall verify that all exceptions previously noted by the Design Engineer have been considered.

J. Construction Drawings and data will be reviewed and stamped by the Design Engineer as follows:
   1. "REVIEWED" if no objections are observed or comments made. Contractor may proceed with the Work directly or indirectly involving the item covered by the submittal. Resubmittal is not necessary.
   2. "REVIEWED AS NOTED," if minor objections, comments, or additions are made but resubmittal is not necessary. Contractor may proceed with the Work directly or indirectly involving the item covered by the submittal.
   3. "REVISE AND RESUBMIT," if the objections, comments, or additions are extensive, or if re-transmittal to another Contractor is required. In this case, the Contractor must resubmit the items after correction, and the same number of copies must be included in the resubmittal as the first submittal. The Contractor will not be permitted to perform any activity that directly or indirectly involves the item covered by the submittal until a "REVIEWED" or "REVIEWED AS NOTED" stamp is provided by the Design Engineer.
   4. "REJECTED" if the submittal under consideration is not, even with reasonable revision, acceptable or when the data submitted are not sufficiently completed to establish compliance with the Contract Conditions. In this case, the Contractor must resubmit a new or modified submittal which meets the scope and intent of the work specified in the Contract. The Contractor will not be permitted to perform any activity that directly or indirectly involves the item covered by the submittal until a "REVIEWED" or "REVIEWED AS NOTED" stamp is provided by the Design Engineer.

K. When corrected copies are resubmitted, the Contractor shall work in "Track Changes" mode to direct specific attention to all revisions, and shall list separately any revisions made other than those called for by the Design Engineer on previous submissions.

L. Resubmittals shall be made within 5 days of the date of the letter returning the material to be modified or corrected, unless within 2 days Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the resubmittal cannot be completed within that time.

M. The Contractor's letter of transmittal for resubmissions shall list the date of the original submittal letter, date of the Design Engineer's letter returning the submittal, and dates of submission and return of any previous resubmittals.

N. Deviations from approved submittals must be pre-approved by the Design Engineer in writing. After submittals have been approved by the Design Engineer, no re-submittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

O. Submittals processed by the Design Engineer do not become Contract Documents and are not to be considered Change Orders. Review, acceptance, or approval of submittals shall not add to the Contract amount and additional costs which may

result shall be solely the obligation of the Contractor.

1.5 APPROVAL TIME OF SUBMITTALS

A. The Design Engineer shall review and return submittals to the Contractor within 5 days of the stamped received date unless regulatory agency approval is required. The Design Engineer reserves the right to withhold action on submittal requiring review of related submittals until related submittal is received. Additional time will be required if processing must be delayed to permit review of related subsequent submittals.

B. The Contractor shall incorporate expected lead times of materials and equipment, and anticipated submittal review time into the Construction Schedule. The Contractor shall anticipate the possibility of delays in lead times and submittal approvals and shall plan to have submittals in and approved well in advance of ordering deadlines. The Contractor will demonstrate advance planning by showing float time for submittal approvals wherever possible in the baseline Construction Schedule. No delays, damages, or time extensions will be allowed for time lost in late submittals.

1.6 SURVEY/LAYOUT DATA

A. When required by the Contract Documents, the Contractor shall submit survey/layout data in accordance with submittal procedures and Section 01 71 23 – Survey. Whenever possible, the Contractor survey/layout data will be overlain on design layout or baseline drawings for comparison. Survey/layout data shall be submitted in the same format as the Construction Drawings.

B. All field books, notes, quantity take-offs and other data developed by the Contractor in performing surveys required as part of the Work shall be available to the Design Engineer for examination throughout the construction period. All such data shall be submitted to the Design Engineer with the other documentation required for final acceptance of the Work.

1.7 ENGINEERING DATA

A. Engineering data covering all equipment and fabricated materials that shall become a permanent part of the Work under this Contract shall be submitted to the Design Engineer for review. The Contractor shall be responsible for timely submittal of required engineering data to allow for the Design Engineer's review. These data shall include Construction Drawings and descriptive information in sufficient detail to show the kind, size, arrangement and operation of component materials and devices; the external connections, anchorages and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.

1.8 CONSTRUCTION DRAWINGS

A. Construction Drawings are generally defined as all drawings, diagrams, illustrations, brochures, schedules and other data that are prepared by the Contractor, a subcontractor, manufacturer, fabricator, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

B. All Construction Drawings shall conform with the Design Drawings and Specifications. All Construction Drawings shall be made to scale, be accurate and distinct, and give all dimensions required for the fabrication, installation and incorporation of the specified items in the Work. Whenever the location of any of the materials, equipment, accessories and appurtenances is not shown on the Construction Drawings, the Contractor shall furnish prints of Construction Drawings to provide the exact location in plan and in elevation of the said materials, equipment, accessories and appurtenances. Construction Drawings of mechanical equipment shall also show outline and section views, complete details, type of materials to be used, electrical diagrams, type of machine work and finish to be applied, and indicated conformity to specified requirements.

1. 9 RECORD DRAWINGS

A. Final Record Drawings shall be prepared in accordance with Section 01 78 39 – Construction and Record Drawings.

1.10 SUBMITTAL REGISTER

A. A submittal register has been prepared for the Contractor's use and is included with Section 01 33 00 – Submittals as Table 01 33 00-1. The Contractor may use this register, or provide one of their own that incorporates the provisions of the one specified.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

- END OF SECTION -

SECTION 01 35 43

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Prevent environmental pollution and reduce environmental impacts during, and as a result of, site construction activities. Other Sections may also contain specific requirements for environmental protection. Those specific requirements are in addition to the requirements presented in this Section. If a conflict arises between the various requirements of the Specifications, the more stringent requirements will apply. Environmental protection requires consideration of potential impacts to noise levels, air, water, land, fish, wildlife, and vegetation.

1.2 SUBMITTALS

A. Contractor shall submit an Environmental Protection Plan proposing environmental protection procedures as part of the Contractor's Operations Plan, including the following:
   1. Means and methods to be used to control airborne particles (e.g., dust).
   2. The Contractor shall indicate all measures proposed for control of noise emissions.
   3. Means and methods to be used to protect soil and water resources.
   4. Means and methods to be used to address spills (e.g., fuel, oil, grease).
   5. Means and methods to be used to clean/decontaminate equipment.

B. Spill Response Report. If a spill occurs, prepare a report documenting the actions taken to mitigate the spill and to prevent future similar spills. Submit to the Design Engineer within 72 hours of the event.

1.3 RELATED DOCUMENTS

A. Section 31 25 13 – Erosion and Sedimentation Control.

B. Section 01 74 19 – Off-Site Disposal.

1.4 REFERENCES

A. New York Standards and Specifications for Erosion and Sediment Controls 2005.

B. New York City Noise Code – Local Law 113 of 2005.

1.5 DEFINITIONS

A. Particulate emissions are defined as the uncontrolled release to the environment of dust or other solid phase materials. These particulates can be generated by construction activities, including operation of equipment and movement of vehicles.

B. Noise emissions are defined as the excessive release of sound, either through the operation of equipment or from other construction-related activity.

PART 2 – PRODUCTS

2.1 DUST CONTROL

A. Supply clean water for dust control if needed.

B. Supply equipment necessary to apply dust control measures.

PART 3 – EXECUTION

3.1 ENVIRONMENTAL MEASURES

A. The Contractor shall consider protection of the environment to be of prime importance during the work.

B. The Contractor shall protect the environment in accordance with all applicable federal and state regulations and applicable permit requirements.

C. During the work, activities, including those of subcontractors, will be supervised to ensure compliance with the intent and details of the environmental protection program.

D. The Contractor will maintain temporary pollution control features installed as part of the work.

3.2 NOISE CONTROLS

A. The Contractor shall control noise in accordance with state and local ordinances and regulations.

B. Maintain equipment noise control devices such as mufflers. Utilize equipment with noise control housing to prevent excessive noise, when applicable.

3.3 DUST CONTROL

A. The Contractor will cover or wet down dry materials and trash to prevent blowing dust and debris. Apply water to ground or road surfaces as needed to control dust emissions.

B. Burning waste materials, rubbish, or other debris will not be permitted on or adjacent to the site.

3.4 REFUELING AREAS

A. Refueling shall not be conducted in the excavation area.

B. Exercise care in handling fuels to minimize the potential for fuel spills.

C. Areas of equipment refueling and maintenance will be equipped with adequate containers for the disposal of wastes produced from upkeep and repair.

D. Inspect vessels, vehicles, and equipment each day for leaks. Complete repairs immediately or remove leaking vessels, vehicles, or equipment from Work Areas.

3.5 WATER POLLUTION CONTROL

A. The Contractor will note the provisions of and comply with the requirements of the Clean Water Act (CWA), which is administered by the NYSDEC.

B. The Contractor will control activities, including maintenance procedures to prevent the entry of petroleum products (e.g., gasoline, diesel, hydraulic fluids, etc.), debris, rubble, concrete, or other deleterious substances into the waterways.

C. The Contractor will not dispose of wastes in storm or sanitary drains without required permits. Disposal of wastes into streams or waterways is also prohibited.

3.6 SPILL PREVENTION, CONTAINMENT AND COUNTERMEASURES

A. The Contractor shall be prepared at all times to intercept, clean-up, and dispose of any spills that may occur on land or water.

B. The Contractor shall keep materials required to clean up spills (spill kits) readily accessible on site.

C. The Contractor shall immediately contain and clean up spills of oil, fuel, excavated material, and other deleterious substances in accordance with federal, state, and local regulatory requirements. Materials used to clean up such spills will be properly disposed of.

D. The Contractor shall immediately report any spills to the Oversight Engineer.

E. The Contractor is responsible for any clean up or repair resulting from spills at no additional cost to the Owner.

3.7 EROSION AND SEDIMENTATION CONTROL

A. The Contractor shall provide and maintain appropriate methods and best management practices (BMPs), equipment, and temporary construction (as

necessary) to control stormwater runoff and erosion at the construction site in accordance with Section 31 25 13 – Erosion and Sedimentation Control.

B. Erosion and sedimentation controls and practices shall be at least as protective as the requirements included within the 2005 New York Standards and Specifications for Erosion and Sediment Controls guidance.

3.8 EQUIPMENT CLEANING

A. The Contractor shall maintain a cleaning area for removal of gross soil accumulation from exterior surfaces of equipment and trucks prior to exiting the site and entering public roads. Contractor shall ensure that soil is not tracked off-site. All waste generated from cleaning areas shall be properly disposed.

B. Proposed cleaning procedures for personnel and equipment shall be described in the Contractor's Health and Safety Plan (HASP). These procedures will be reviewed by the Design Engineer prior to initiation of construction activities. The Contractor shall be responsible for constructing and maintaining the cleaning area to accommodate all loads, equipment, and migration scenarios. Any releases of liquids from the cleaning area into a clean area shall be mitigated at the Contractor's expense.

C. The extent and method of cleaning shall be at the discretion of the Contractor; however, equipment and materials shall be observed by the Oversight Engineer prior to its departure from the site. In addition, the Oversight Engineer reserves the right to require additional cleaning if deemed necessary and to perform sampling and analysis as part of the pre-departure confirmation. Additional decontamination, if required, shall be at no additional expense to the Owner.

D. Trucks transporting excavated material shall be kept free of any external accumulations that could track onto local roadways. Truck tires and bodies shall be kept clean at all times, with no leakage or spillage out of the vehicle. Any leakage or spillage that occurs in the loading area shall be immediately cleaned up by the Contractor and the truck being loaded shall be inspected to ensure the body and tires are clean. All truck cleaning activities shall be conducted by the Contractor, at no additional expense to the Owner.

3.9 WASTE MANAGEMENT AND DISPOSAL

A. The Contractor shall comply with applicable state and federal regulations, standards, and guidelines for handling and disposal of solid and hazardous waste.

B. The Contractor shall designate one or more construction waste collection areas on-site and will have an adequate number of containers with lids or covers for waste. Waste shall be collected from the containers before they overflow.

C. Waste shall be transported and disposed of at an off-site facility approved by the Design Engineer in accordance with Section 01 74 19 – Off-Site Disposal.

- END OF SECTION -

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This Section includes requirements for temporary facilities required during construction including Contractor construction facilities, vehicular access and parking, temporary barriers and enclosures, and temporary controls.

1.2 SUBMITTALS

A. As a sub-section to the Contractor's Operations Plan, Contractor shall prepare a Temporary Facilities Plan, indicating manufacturer's cut sheets for and the proposed location of field offices.

1.3 RELATED DOCUMENTS

A. Section 01 71 03 – Mobilization/Demobilization
B. Section 01 74 19 – Off-Site Disposal
C. Section 31 25 13 – Erosion and Sedimentation Control

1.4 CONSTRUCTION FACILITIES

A. Field Offices. In addition to the field office trailer(s) that the Contractor chooses to install for the Contractor's use, Contractor shall erect, furnish and maintain a field office (e.g., one trailer each) for the Oversight Engineer and NYSDEC Oversight. Trailer shall be removed from the site upon issuance of certificate of substantial completion in accordance with 01 77 00 – Closeout Procedures. The Contractor shall install and maintain, in accordance with all applicable codes and regulations, the electric, internet and telephone services for the office trailer. Trailer provided for the Oversight Engineer shall be cleaned at least weekly. Field office trailers shall consist of and be equipped with the following appurtenances throughout the project:
    1. Trailer shall be a minimum of 36' x 10' (Williams-Scotsman MO3610, or approved equal).
        a) Trailer shall have the following built-in items:
            1) overhead shelves in each end office
            2) one drafting table
            3) forced air heat
            4) closet
            5) sufficient supply of electrical outlets and a minimum two telephone outlets
            6) cable- or DSL-ready outlets

7) four operational phone jacks

b) Trailer shall have the following movable items, at a minimum:
   1) four office chairs on rollers, with armrests and eight folding chairs
   2) three large waste baskets
   3) one 4-drawer legal-size, fire-proof, filing cabinets with locks
   4) one table (measuring 30 x 60 inches)
   5) one 10-pound Class ABC fire extinguisher (Protectoseal or equivalent), Model No. 2A10SA, or approved equivalent
   6) one first-aid kit (Johnson & Johnson Co., Model No. 25 or equivalent)
   7) one eye wash station
   8) one refrigerator (minimum 2.5-cubic-foot capacity)
   9) two telephones
   10) one color copy machine capable of 11" x 17" and scanning capability for unrestricted use
   11) wireless router for internet connection

c) Maintenance of the trailers shall include adequate heating, cooling, electric, internet, and telephone services, lighting, portable sanitary facilities, snow removal as required, and janitorial services not less than weekly. All garbage, dust, and miscellaneous material collected during clean-up of the facilities shall be disposed of at a sanitary landfill.

B. Material Sheds and Temporary Structures. Provide material sheds and other temporary structures of sturdy construction and neat appearance.

C. Sanitary Facilities. Temporary sanitary facilities shall be provided by the Contractor in sufficient numbers for use during execution of the Work, consistent with 29 CFR 1926.51. The facilities shall be self-contained, single occupant units of the chemical, aerated recirculation or combustion type, containing properly vented and fully enclosed nonabsorbent material, such as fiberglass or approved equivalent. The units shall be properly screened from public view or access and shall be locked when construction operations are not underway. Contractor shall service, clean, and maintain such facilities and enclosures on a minimum weekly basis. Contents contained within shall be disposed of in accordance applicable regulations.

D. Potable Water. Potable water shall be provided by the Contractor at each field office for the duration of the Work from an off-site source in sufficient quantity and of sufficient quality for all potables needs of the Contractor, Oversight Engineer, and the Owner at no additional cost to the Owner. The quantity of water required for equipment and personnel decontamination, dust control, and other Site activities shall be determined by the Contractor. If municipal water is intended for use, Contractor shall pay all necessary fees and obtain all permits from the proper agencies/departments to use the municipal water system for the

Work. Contractor is responsible for any temporary or permanent connections and the removal of the connections at the completion of the Work.

E. Location. Obtain prior written approval for location of field offices, material sheds and temporary structures, and sanitary facilities from the Oversight Engineer.

F. Temporary Facilities. Upon mobilization to the site and initiation of construction activities, the Contractor shall provide (at a minimum) the following temporary facilities for use until the completion of construction activities:
   1. Telephone Service: The Contractor shall provide and maintain telephone service and equipment. The Contractor will be responsible for local and long distance telephone charges originating from each office.
   2. Internet Service: The Contractor shall provide and maintain internet service (via hard-line and/or wireless).
   3. Temporary Lighting for Construction Purposes: The Contractor shall provide and maintain lighting for construction operations.
   4. Health and Safety Equipment (including equipment and personnel).

G. Decontamination Area. Provide in accordance with Design Drawings.

H. Temporary Water Management System Containment Area. Provide in accordance with Design Drawings.

I. Access Road. Provide in accordance with Design Drawings.

1.5 VEHICULAR ACCESS AND PARKING

A. Vehicle access:
   1. Personal vehicles shall not be allowed on site except for in designated employee parking areas. The Contractor is responsible for transport of personnel to designated Work areas, if required.
   2. Routes of ingress and egress on the premises to the location of the Work shall be as shown on the Design Drawings.
   3. Keep designated access roads clear of dirt and debris resulting from the Work.
   4. Provide a means of removing gross contamination from vehicle wheels before entering paved roads in accordance with Section 01 35 43 – Environmental Protection.
   5. All means and methods for maintaining paved areas and roadways shall be approved by the Oversight Engineer

B. Vehicle parking:
   1. Keep designated parking areas clear of dirt and debris resulting from the Work.

1.6 TEMPORARY BARRIERS AND ENCLOSURES

A. Protection of Workers and Public. Effect and maintain at all times during performance of the Work, barriers and lights necessary for the protection of workers and the public. Provide suitable barricades, lights, “danger” or “caution” or “street closed” signs as appropriate.

1.7 TEMPORARY CONTROLS

A. Smoke prevention:
   1. Strictly observe all air pollution control regulations.
   2. No open fires are permitted.

B. Implement temporary drainage provisions in accordance with Section 31 25 13 – Erosion and Sedimentation Control.

C. Prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities. Do not permit sanitary wastes to enter any drain or watercourse other than sanitary sewers. Do not permit sediment, debris or other substances to enter sanitary sewers. Take reasonable measures to prevent such materials from entering any drain or watercourse.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

- END OF SECTION -

SECTION 01 71 03

MOBILIZATION/DEMOBILIZATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The Work covered by this Section includes furnishing all materials and equipment and performing all labor necessary to assemble and set up for the project. This shall include the initial movement of personnel and equipment to the site and the establishment of field offices, shops, storage areas, sanitary and other facilities necessary and required by the Contractor to execute the Work.

B. This Work also includes the demobilization of all equipment, material and labor established during mobilization and construction activities upon completion of the Work.

1.2 DEFINITIONS

A. Mobilization includes locating and transporting all necessary equipment, materials and labor to the site to complete all work as specified in the Contract Documents.

B. Demobilization includes the movement and removal of all equipment, materials and labor established during mobilization and construction activities from the site following completion of the Work.

1.3 REFERENCES

A. Section 01 35 43 – Environmental Protection.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 MOBILIZATION

A. Locate and transport equipment, materials and labor to the site once notice has been provided by the Owner. Equipment and materials must access the site via the assigned roadway provided by the Owner, and must be clean and devoid of free liquids, dirt and debris.

3.2 DEMOBILIZATION

A. All equipment, materials and vehicles must be decontaminated prior to removal from the site in accordance with Section 01 35 43 – Environmental Protection.

B. Remove equipment, materials and labor from the site upon approval of the Owner.

- END OF SECTION -

SECTION 01 71 23
SURVEY

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Contractor shall provide office and field-based surveying services of the types required to properly construct and document the work. At a minimum, surveying services are to include:
   1. Developing and making all detailed surveys and measurements required for construction; including slope stakes, batter boards, and all other working lines, elevations, and for documentation of completed work.
   2. Developing location and depth of existing features including but not limited to storm sewer piping inverts, catch basin structure depths and location/size of existing pavement markings.
   3. Providing materials required for benchmarks, control points, batter boards, grade stakes, structure and pipeline elevation stakes, and other items.
   4. Keeping a transit, theodolite, or total station (theodolite with electronic distance measurement device); leveling instrument; and related implements such as survey rods and other measurement devices, at the Site at all times, and having a skilled instrument person available when necessary for laying out the work.
   5. Rectifying all work improperly installed because of not maintaining, not protecting, or removing without authorization established reference points, stakes, marks, and monuments.
   6. Providing such facilities and assistance necessary for the Design Engineer to check lines and grade points placed by Contractor. Do not perform excavation or fill work until all survey necessary for determining payment quantities have been completed and accepted by the Design Engineer.

1.2 SUBMITTALS

A. The Contractor shall submit a Topographic Survey Plan (to be included as a part of the Contractor's Operations Plan) to the Design Engineer for review prior to the start of work. The Topographic Survey Plan shall include, but not be limited to, the following:
   1. Surveying:
      a. Submit original field books within two days after completing survey work.
      b. Submit pre- and post- construction surveys.
   2. All survey information shall be provided in electronic AutoCAD file format and include, at a minimum, the following information:
      a. Survey points with descriptive labels

b. Compiled TIN (break lines and points) used to generate elevation contours
c. Elevation contours
d. Survey limits
e. Location of existing storm sewer catch basins including rim, depth and inverts of existing storm sewer piping. Vertical elevations shall be reported to the nearest 0.01 foot.
f. Location and size of existing pavement markings.

3. Certificates: When requested by the Design Engineer, submit certificate signed by professional surveyor certifying that elevations and locations of the work comply with the Contract Documents. Explain all deviations, if any.
4. Qualifications Statements:
   a. Surveyor: Name and address of firm and resumes of each professional land surveyor and crew chief conducting the survey work. Submit at least five days prior to beginning survey work. During the Project, submit resume for each new registered land surveyor and crew chief employed by or retained by Contractor at least five days prior to starting on the survey work.

1.3 RELATED DOCUMENTS

A. Section 01 11 00 - Summary of Work

1.4 CONTRACTOR'S SURVEYOR

A. Employ or retain the services, as needed, at the Site a surveyor with experience and capability of performing surveying and layout tasks required in the Contract Documents and as required for the work. Surveyor shall be a professional land surveyor registered and licensed in the State of New York. Surveyor's tasks include, but are not necessarily limited to, the following:
   1. Providing required surveying equipment, including transit or theodolite, or total station (theodolite with electronic distance measurement device), level, stakes, and surveying accessories.
   2. Establishing required lines and grades for excavations, site grading and restoration.
   3. Perform conversion of Design Engineer furnished data files for grade control equipment. (No guarantee is made that the data systems used by the Design Engineer will be directly compatible with the systems the Contractor uses).
   4. Performing pre- and post-construction surveys and ensuring specified layer thicknesses are used during backfilling and restoration activities.
   5. Preparing and maintaining professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.

6. Perform an as-built survey of all constructed site features (e.g., completed excavation grades, final grades, locations and elevations of constructed features and any discovered utilities, etc.).
7. Complying with requirements of the Contract Documents relative to surveying and related work.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 REFERENCE POINTS

A. Oversight Engineer established reference points damaged or destroyed by Contractor will be re-established by Oversight Engineer at Contractor's expense. Survey control for construction and documentation purposes shall be the responsibility of the Contractor. The Contractor shall safeguard all survey points and bench marks. Should any of these points be destroyed, the replacement cost shall be borne by the Contractor. The Contractor shall assume the entire expense of rectifying work improperly constructed due to failure to maintain and protect such established survey points and bench marks. All control points shall be of third order accuracy.

B. From Oversight Engineer established reference points, establish lines, grades, and elevations necessary to control the work. Obtain measurements required for executing the work to tolerances specified in the Contract Documents.

C. Establish, place, and replace as required, stakes, markers, and other reference points necessary for control, intermediate checks, and guidance of construction operations.

D. Contractor shall be responsible for the layout of any additional survey controls, grid coordinate locations, lines, grades, and elevations necessary for the proper construction, documentation, and testing of the work.

3.2 SURVEYS TO DETERMINE REMOVAL VOLUME FOR RECORD

A. Contractor to provide all survey data and information to the Oversight Engineer and Design Engineer for verification purposes and in accordance with the Contract Documents. A copy of survey notes shall be on the property at all times for review.

B. Notify the Oversight Engineer at least 24 hours in advance of performing survey services for determining quantities. Unless agreed to by the Oversight Engineer, perform quantity surveys in the presence of Oversight Engineer.

C. Survey procedures shall conform to recognized industry standards. Failure to perform and process such surveys in accordance with recognized standards will result in a rejection and non-payment for work performed.

D. Before beginning work, verify actual field dimensions and locations. If there are any discrepancies between the Contract Documents and the actual field conditions, notify the Design Engineer immediately in writing describing the discrepancy. Do not proceed until the discrepancy is resolved to the satisfaction of the Design Engineer and Oversight Engineer.

3.3 ACCURACY

A. Establish Contractor's temporary survey references points for Contractor's use with accuracies sufficient for construction of site conditions and features specified in the Contract Documents.

B. Horizontal and vertical survey tolerance for constructed items is 0.10 foot for general site grading and 0.05 foot for structural features (e.g., pipes, etc.) unless otherwise specified in the Design Drawings or approved by the Design Engineer. The point group density for the topographic surveys shall be a maximum spacing of 50 feet.

C. Accuracy of staking shall be as required for excavation, final grading and construction of temporary and permanent features indicated in the Contract Documents.

- END OF SECTION -

SECTION 01 74 19

OFF-SITE DISPOSAL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools, equipment, accessories and appurtenances necessary to provide transport and disposal of all generated waste streams as a result of the construction activities including, but not limited to, excavation, debris removal and groundwater removal generated as a result of site clearing, equipment maintenance and cleaning, and residual wastes and general refuse generated by the Contractor and the Oversight Engineer. The Contractor shall be responsible for obtaining the appropriate permits and equipment necessary for the transportation of such materials.

1.2 SUBMITTALS

A. Off-Site Disposal Plan:
   1. As a sub-section to the Contractor's Operation's Plan, the Contractor shall provide means and methods for the off-site disposal of all generated waste as a result of construction activities, including permitted solid waste disposal facility location in accordance with paragraph 3.4 A of this specification. This plan shall also include all appropriate local, state and federal transport permits, licenses and approvals.

B. The Contractor shall provide the Oversight Engineer with two copies of the following off-site disposal documentation items as they relate to the off-site transportation and disposal of waste materials as a part of the Weekly Construction Report.

1. load number (sequential)
2. executed Material Shipping Record forms executed by transporter and disposal facilities
3. truck ID number (license plate number of the truck and/or trailer used)
4. time of departure from the site
5. gross weight
6. tare weight
7. net load weight
8. hazardous material status if applicable

C. Misplaced Material Report:
   1. The Contractor shall provide written confirmation following the misplacement of materials, including the description, location and quantity of such obstructions, to the Oversight Engineer within 24 hours of the incident.

D. The Contractor shall provide any pre-characterization forms and/or samples that are required by the disposal facility as described in Subsection 3.4 of this Section.

E. The off-site disposal documentation shall be summarized in a final Off-Site Disposal Report upon completion of off-site disposal activities and submitted in accordance with Section 01 77 00 – Closeout Procedures.

1.3 RELATED DOCUMENTS

A. Applicable Occupational Safety and Health Administration (OSHA) Regulations

B. Transportation regulations, including United States Department of Transportation (USDOT) regulations, including Title 29 Parts 171 and 172 and New York State Department of Transportation (NYSDOT) rules and regulations

C. State of New York Rules and Regulations, including Title 6 of the Official Compilation of Codes, Rules and Regulations (6 NYCRR) Parts 360, 364, 370, and 372 regarding treatment/disposal, transportation, and management of hazardous waste

D. New York State Department of Environmental Conservation (NYSDEC) Technical Administrative Guidance Memorandum (TAGM) 4061 – *Management of Coal Tar Wastes and Coal Tar Contaminated Soil and Sediment from Former Manufactured Gas Plants.*

E. Section 01 35 43 – Environmental Protection

F. Section 01 77 00 – Closeout Procedures

PART 2 – PRODUCTS

2.1 STORAGE AND TRANSPORT

A. Containers used to temporarily store or transport materials from the site shall be USDOT-approved and appropriate for the type of material being stored or transported. At a minimum, trucks used for off-site transport of materials shall be lined and covered to prevent spillage of the transported material.

2.2 TRASH RECEPTACLES

A. Adequate trash receptacles for general refuse shall be provided for use by the Contractor, Owner, and Oversight Engineer and serviced weekly by the Contractor.

PART 3 – EXECUTION

3.1 CHARACTERIZATION

A. Characterization of general refuse and stone removed from the temporary material staging area and access roads is not required.

3.2 LOADING AND TRANSPORTATION

A. Equipment leaving the various work zones or the site shall comply with Section 01 35 43 – Environmental Protection, and will be inspected and cleaned, as necessary, by manually removing any visible accumulations of solids by brushing or, if needed, by high-pressure steam/water.

B. All waste streams (i.e., excavated material, erosion and sedimentation controls, geotextile and stone from temporary support facilities, cleared vegetation [i.e., trees, shrubs], excavation/construction contact water, and general refuse) shall be secured into containers (i.e., roll-offs, tractor trailers, etc.), labeled, packaged and transported in accordance with appropriate USDOT and NYSDOT requirements.

C. All loads destined for off-site disposal shall be covered with tarpaulin covers prior to transport off-site.

D. All waste streams shall be hauled directly from the site to the final disposal facility and will follow the transportation requirements outlined in the Waste Management Plan prepared by the Design Engineer.

E. The Contractor shall be required to have all appropriate local, state and federal transport permits, licenses and approvals. Transportation of all waste streams shall be in accordance with all federal, state and local laws, rules and regulations.

F. The Contractor shall conduct all loading, transport and off-site disposal activities such that no spillage occurs. The Contractor shall be responsible for conducting any and all activities necessary to remediate unanticipated spills or leaks at no additional cost to the Owner.

G. In accordance with applicable regulations, all containers used for the off-site transport of materials shall be completely covered prior to off-site transport.

H. Material containing hazardous constituents shall be segregated from non-hazardous materials, and the Contractor shall be responsible for separate storage, removal and transport of this material.

3.3 MISPLACED MATERIALS

A. If the Contractor, during execution of the Work, loses, dumps, throws overboard, sinks or misplaces any material or equipment, the Contractor shall promptly recover and remove the same. The Contractor shall give immediate verbal notice, followed by written confirmation, of the description, location and quantity of such obstructions to the Design Engineer, and shall mark such obstructions until the material or equipment is removed or unless otherwise directed by the Owner. Should the Contractor refuse, neglect or delay compliance with this requirement, such obstructions may be removed by the Owner, and the cost of such operations may be deducted from any money due to the Contractor.

3.4 DISPOSAL FACILITY

A. All waste streams shall be determined by the Contractor with approval by the Owner and Design Engineer.

B. Additional waste characterization results from samples collected by the Contractor, shall be reviewed by the Oversight Engineer, as required by applicable federal, state and local laws, rules and regulations, as well as any additional requirements imposed by the receiving landfill or disposal facility.

C. Additional pre-characterization forms and/or samples that are required by the disposal facility, above and beyond the analyses performed by the Design Engineer shall be obtained from the excavated soil.

D. Documentation between the Contractor and the disposal facility identifying the type of material to be disposed and indicating that the disposal facility will accept the waste material will be provided to NYSDEC prior to off-site disposal of material generated during the storm sewer replacement.

3.5 DISPOSAL OF DEMOLITION DEBRIS

A. Transportation and Disposal:
   1. Non-Hazardous Material: Properly transport and dispose of non-hazardous demolition debris at appropriate landfill or other suitable location, in accordance with Laws and Regulations. Non-hazardous material does not contain Asbestos, PCBs, Petroleum, Hazardous Waste, Radioactive Material, or other material designated as hazardous in Laws and Regulations.

2. Hazardous Material: When handling and disposal of hazardous materials is included in the Work, properly transport and dispose of hazardous materials in accordance with the Contract Documents and Laws and Regulations.

B. Submit to Oversight Engineer information required in this Section on proposed facility(ies) where demolition material will be recycled. Upon request, Oversight Engineer or Owner, shall be allowed to visit recycling facility(ies) to verify adequacy and compliance status. During such visits, recycling facility operator shall cooperate and assist Oversight Engineer and Owner.

- END OF SECTION -

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Provisions of this section apply to the procedural requirements for closeout of Work executed by the Contractor.

1.2 SUBMITTALS

A. The Contractor shall provide all documentation pertaining to all components of work executed by the Contractor and requiring inspection prior to submitting an application for Final Certification Inspection including, but not limited to, tables showing actual excavated and backfilled volumes, Construction Drawings, certified survey data, executed warranties, certified weigh slips from the disposal facility, maintenance agreements, inspection certificates and similar required documentation for specific units of work.

B. *Truck volume counts and measurement summary*. Following completion of construction and as a pre-requisite for Final Certification Inspection, the Contractor shall provide the Design Engineer with final truck volume counts and measurement summary tables. Provide supporting data that was used to develop the measurement summary tables.

C. The Contractor shall prepare and submit Closeout Documents in accordance with Section 01 78 39 – Construction and Record Drawings.

1.3 RELATED DOCUMENTS

A. Section 01 11 00 – Summary of Work

B. Section 01 78 39 – Construction and Record Drawings

1.4 PROJECT CLOSEOUT AND INSPECTION PROCEDURES

A. Substantial Completion
   1. Preliminary Procedures: Prior to requesting an inspection for Substantial Completion, complete the following:
      a. Prepare a list of items to be completed and corrected, the value of items on the list, and reasons why the items are not complete. Submit list to the Design Engineer.

b. Advise the Design Engineer, in writing, of pending insurance changeover requirements if applicable.
c. Terminate and remove temporary facilities, including mockups, construction tools, and similar elements from the site as necessary.
d. Advise the Design Engineer, in writing, of changeover in utilities if applicable.
e. Complete grading, restoration, and final cleaning requirements.

2. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of the request, Design Engineer will either proceed with the inspection or notify the Contractor of unfulfilled requirements. The Design Engineer will prepare the Certificate of Substantial Completion after inspection or will notify the Contractor of items, either on Contractor's list or additional items identified by the Design Engineer, that must be completed or corrected before the Certificate of Substantial Completion will be issued. Any outstanding items required for Substantial Completion at this time will be documented as the formal punch-list for Substantial Completion.
   a. Re-inspection: Request re-inspection when the punch-list is completed or corrected.
   b. Results of completed inspection will form the basis of requirements for Final Completion.

B. Final Acceptance
1. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   a. Submit a Request for Payment.
   b. Submit a Certification from the Design Engineer stating that all items, actions, and requirements of the punch-list have been completed, corrected, satisfied, or otherwise resolved.
   c. Submit evidence of continuing insurance required by the Contract Documents.

2. Inspection: Submit a written request for final inspection for acceptance. The Design Engineer will prepare a Recommendation of Final Payment after inspection or will notify the Contractor of work that must be completed or corrected before the Certificate will be issued.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 FINAL CLEANING

A. At the time of project closeout, clean and restore the Work area to its pre-construction condition. Complete the following operations before requesting the Design Engineer's inspection for certification of substantial completion:
   1. remove nonpermanent protection and labels
   2. remove debris
   3. inspect Project Construction Area

- END OF SECTION -

SECTION 01 78 39

CONSTRUCTION AND RECORD DRAWINGS

PART 1 – GENERAL

1.1 WORK SPECIFIED

A. This section specifies the requirements for preparing Construction Drawings and Record Drawings.
   1. During construction, the Contractor shall mark up one set of the Design Drawings, which will serve as Construction Drawings, to document approved field modifications. The Contractor shall submit the Construction Drawings to the Design Engineer following the completion of construction activities and prior to the Final Certification Inspection.
   2. Following the completion of construction activities, the Design Engineer will review the Construction Drawings and prepare Record Drawings.

1.2 SUBMITTALS

A. The Contractor shall prepare three copies of the Construction Drawings. These drawings shall be submitted to the Design Engineer prior to the Final Certification Inspection review by the Design Engineer and the Owner's approval. These drawings shall be neat, legible and accurate. The Design Engineer shall review and respond in accordance with Section 01 33 00 – Submittals. The Construction Drawings shall comply with the requirements specified below:
   1. Installations of any kind or description known to exist within the construction area. The locations shall include dimensions of permanent features.
   2. The location and dimensions of any changes within the design features of any kind or description known to exist within the construction area. The locations shall include dimensions of permanent features.
   3. Correct grade or alignment of roads, structures, utilities or other similar project components if any modifications were made.
   4. Correct elevations if changes were made in site grading.
   5. Changes in details or dimensions.
   6. The topography and grades of all drainage structures installed or affected as part of the project construction.
   7. Where Design Drawings or Technical Specifications allow options, only the option selected for construction shall be shown on the Construction Drawings.
   8. Additional work requested by the Design Engineer.
   9. Horizontal and vertical location of aboveground and underground utilities and appurtenance referenced to permanent surface improvement.

1.3 RELATED DOCUMENTS

A. Section 01 77 00 – Closeout Procedures

B. Section 01 33 00 – Submittals

1.4 MAINTENANCE OF DOCUMENTS

A. Maintain complete sets of pertinent contract documentation in the Contractor's field office in clean, dry, legible condition that may affect the content and details provided in the Construction Drawing including, but not necessarily limited to, the following: Specifications, construction schedule, addenda, approved Shop Drawings, samples, photographs, change orders, other modifications of Contract Documents, test records, survey data and field orders.

B. Maintain a complete set of either blue- or black-line prints of the Construction Drawings and shop drawings to record modifications throughout the construction activities. Modify the Construction Drawings during the Work to show both changes and the actual installation, in sufficient detail to form a complete record of all construction activities. Give particular attention to work that will be concealed and difficult to measure and record at a later date, and work that may require servicing or replacement during the life of the project. Require the entities marking prints to sign and date each mark-up. Bind prints into manageable sets, with durable paper covers, appropriately labeled.

C. Provide files and racks for proper storage and easy access.

D. Make documents available at all times for inspection by the Oversight Engineer.

E. Construction Drawings, as referenced above, shall not be used for any other purpose and shall not be removed from the Contractor's office without the Oversight Engineer’s approval.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

- END OF SECTION -

SECTION 01 90 60

PROJECT SCHEDULE

PART 1 – GENERAL

1.1 DESCRIPTION

A. A Critical Path Method (CPM) schedule shall be provided, updated, and maintained by the Contractor throughout the project.

B. The Contractor shall prepare and submit to the Design Engineer, the CPM schedule clearly identifying the date prepared. The schedule shall be updated and submitted, with appropriate revision date noted, twice per month for the duration of the project or as may be required to maintain an accurate and effective schedule. The Contractor shall also assume that no standby time is necessary during the project.

1.2 SUBMITTALS

A. As a sub-section to the Contractor's Operations Plan, prepare a Sequencing of Work narrative of the specific activities anticipated in order perform the work presented in the Design Documents.

1.3 RELATED DOCUMENTS

A. Section 01 14 00 – Work Restrictions

PART 2 - PRODUCTS

2.1 SCOPE OF CRITICAL PATH METHOD SCHEDULE

A. The Work Schedule should include all elements of the Project and be neatly prepared and labeled as a bar graph indicating all anticipated start and completion dates. Additional requirements are provided below.
   1. Submit a horizontal bar chart with separate lines for each section of work.
   2. At a minimum, the following major work items should be included, with appropriate subtasks included as necessary:
      a. Technical Submittals.
      b. Mobilization.
      c. Site Preparation.
      d. Installation of excavation support.
      e. Dewatering/water management activities.
      f. Excavation.
      g. Demolition of structures.

h. Storm Sewer Pipe Installation.
i. Material transportation for off-site transportation/disposal.
j. Site Restoration.
k. Demobilization/Recordkeeping.

3. Show complete sequence of construction by activity (including work by subcontractors). The Construction schedule provided by the Contractor shall show seasonal considerations and planned shutdown durations (if any).
4. The schedule shall also indicate the following:
   a. Activity description.
   b. Duration required to perform each activity expressed in calendar days.
   c. Earliest date on which activity may be started based on sequences depicted in the schedule.
   d. Latest date on which activity can be completed without delaying project completion.

B. Project implementation shall be in accordance with the approved construction schedule submitted by the Contractor.

C. Once every two weeks, the Contractor shall report project progress, based upon scheduled performance. The reporting procedure will include a listing of activities which are completed or partially completed during the period and the effect of progress on the original schedule.

D. If, in the opinion of the Oversight Engineer, the Contractor fails to comply with obligations set forth in preceding paragraphs, the Oversight Engineer may require the Contractor to submit a revised schedule indicating the manner in which the rate of progress will be improved to ensure completion.

E. The revised schedule shall be similar to the original schedule and the Design Engineer shall have the right to require modifications therein in the same manner and to the same extent. Any costs incurred in preparing such a revised schedule shall be borne entirely by the Contractor.

F. Failure of the Contractor to meet their obligations, as set forth above, shall be grounds for determination by the Design Engineer that the Contractor is not executing work with such diligence as will ensure completion within the time specified. On such determination, the Owner may terminate the Contractor's right to proceed with work. Should the Contractor fail to submit required schedule to the Project Engineer as specified above, or updates within seven calendar days after the 1st or 15th of each month, the Design Engineer shall have the right to postpone approval of the Contractor's requisitions for payment until said schedule is received and approved.

G. None of the foregoing paragraphs shall operate to relieve the Contractor of their obligation of completing this Contract in accordance with the terms and within the time limit prescribed hereunder.

- END OF SECTION –

SECTION 02 41 00

DEMOLITION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified and required for demolition, removal, and disposal Work.
   2. The Work under this Section includes, but is not necessarily limited to:
      a. Demolition and removal of existing materials and equipment as shown or indicated in the Contract Documents. The Work includes demolition of asphalt, concrete, curbing, lighting, fencing, concrete catch basins, piping, guard rails, steel posts, bollards, and related requirements.
      b. Remove from slabs, foundations, walls, and footings that are to be demolished all utilities and appurtenances embedded in such construction.
   3. Demolitions and removals specified under other Sections shall comply with requirements of this Section.
   4. Perform demolition Work within areas shown or indicated.
   5. Pay all costs associated with transporting and, as applicable, disposing of materials and equipment resulting from demolition.

B. Coordination:
   1. Comply with all Division 01 Specifications.
   2. Review procedures under this and other Sections and coordinate the Work that will be performed with or before demolition and removals.

1.2 QUALITY ASSURANCE

A. Qualifications:
   1. Electrical Removals: Entity and personnel performing electrical removals shall be electrician legally qualified to perform electrical construction and electrical work in the jurisdiction where the Site is located.

B. Regulatory Requirements:
   1. Demolition, removal, and disposal Work shall be in accordance with 29 CFR 1926.850 through 29 CFR 1926.860 (Subpart T - Demolition), and all other Laws and Regulations.
   2. Comply with requirements of authorities having jurisdiction.

1.3 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. Procedure Submittals:
      a. As part of the Contractor's Operation Plan, submit a Demolition and Removal Plan. Plan shall be submitted not less than ten days prior to starting demolition Work, submit acceptable plan for demolition and removal Work, including:
         1) Proposed procedures as applicable.
         2) Equipment proposed for use in demolition operations.
         3) Disposal facility(ies) proposed, including facility owner, facility name, location, and processes. Include copy of appropriate permits and licenses, and compliance status.
         4) Planned demolition operating sequences.
         5) Detailed schedule of demolition Work in accordance with the accepted Process Schedule.
   2. Notification of Intended Demolition Start: Submit in accordance with Paragraph 3.1.A of this Section.
   3. Qualifications Statements:
      a. Name and qualifications of entity performing electrical removals, including copy of licenses required by authorities having jurisdiction.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.1 PREPARATION

A. Notification:
   1. At least 48 hours prior to commencing demolition or removal, notify Oversight Engineer in writing of planned start of demolition Work. Do not start removals without permission of Oversight Engineer.

B. Protection of Surrounding Areas and Facilities:
   1. Perform demolition and removal Work in manner that prevents damage and injury to property, structures, occupants, the public, and facilities. Do not interfere with use of, and free and safe access to and from, structures and properties.
   2. Closing or obstructing of roads, drives, sidewalks, and passageways adjacent to the Work is not allowed unless indicated otherwise in the Contract Documents.

Conduct the Work with minimum interference to vehicular and pedestrian traffic.

3. Provide temporary barriers, lighting, sidewalk sheds, and other necessary protection.
4. Repair damage to facilities that are to remain.

C. Existing Utilities: In addition to requirements of Division 01 Specifications, perform the following:
   1. Should uncharted or incorrectly charted Underground Facilities be encountered, Contractor responsibilities shall be in accordance with the Contract Documents. Cooperate with utility owners in keeping adjacent services and facilities in operation.
   2. Sanitary Sewer: Before proceeding with demolition, locate and cap all sewer lines and service laterals discharging from the building or structure being demolished.
   3. Storm Water: Existing storm water system shall remain in place until demolitions of existing building or structure is completed. Upon completing demolition, cut and cap storm sewer laterals at locations shown on the Drawings. Remove existing storm water piping and related structures between points of cutting, and backfill, restore to grade, and stabilize the area over the removed facilities.
   4. Water Piping: Before proceeding with demolition, locate and cap all potable and non-potable waterlines and service laterals serving the building or structure being demolished.
   5. Other Utilities: Before proceeding with demolition, locate and cap as required all other utilities, such as fuel and gas; heating, ventilating, and air conditioning; electric; and communications; and service laterals serving the building or structure being demolished.
   6. Shutdown of utility services shall be coordinated by Contractor, assisted by Owner as required relative to contacting utility owners.

3.2 DEMOLITION – GENERAL

A. Locate construction equipment used for demolition Work and remove demolished materials and equipment to avoid imposing excessive loading on supporting and adjacent walls, floors, framing, facilities, and Underground Facilities.

B. Pollution Controls:
   1. Use water misting, temporary enclosures, and other suitable methods to limit emissions of dust and dirt to lowest practical level. Comply with Division 01 and Laws and Regulations.
   2. Do not use water when water may create hazardous or objectionable conditions such as icing, flooding, or pollution.
   3. Clean adjacent structures, facilities, properties, and improvements of dust, dirt, and debris caused by demolition Work, in accordance with Division 01.

C. Demolition of Site Improvements:
   1. Pavement, Sidewalks, Curbs, and Gutters: Demolition of asphalt or concrete pavement, sidewalks, curbs, and gutters, as applicable, shall terminate at cut edges. Edges shall be linear and have a vertical cut face.
   2. Fencing, Guardrails, and Bollards: Remove to the limits shown or indicated on the Drawings. Completely remove below-grade posts and concrete.
   3. Manholes, Vaults, Chambers, and Handholes: Remove to the limits shown or indicated on the Drawings.
   4. Underground Facilities Other than Manholes, Vaults, Chambers, and Handholes: Remove to the extent shown or indicated on the Drawings. Unless otherwise shown or indicated, cap ends of piping to remain in place in accordance with the "Mechanical Removals" Article in this Section.

E. Salvage and Ownership:
   1. Materials and equipment to remain Owner's property shall be carefully removed and appropriately handled by Contractor to avoid damage and invalidation of warranties in effect, and shall be cleaned and stored at the Site (or other site specified in the Contract Documents) at place designated by Oversight Engineer or Owner.
   2. Remove and dispose of all material and equipment not requested by Owner.

3.3 STRUCTURAL REMOVALS

A. Remove structures to lines and grades shown or indicated, unless otherwise approved by Design Engineer. Where limits are not shown or indicated, limits shall be four inches outside item to be installed. Removals beyond limits shown or indicated shall be at Contractor's expense and such excess removals shall be reconstructed to satisfaction of Oversight Engineer without additional cost to Owner.

B. Recycling and Reuse of Demolition Materials:
   1. All concrete, brick, tile, masonry, roofing materials, reinforcing steel, structural metals, miscellaneous metals, plaster, wire mesh, and other items contained in or upon building or structure to be demolished shall be removed, transported, and disposed of away from the Site, unless otherwise approved by Oversight Engineer.
   2. Do not use demolished materials as fill or backfill adjacent to structures, in pipeline trenches, or as subbase under structures or pavement.

C. Remove concrete and masonry to the lines shown or indicated by sawing, drilling, chipping, and other suitable methods. Leave the resulting surfaces true and even, with sharp, straight corners that will result in neat joints with new construction and be satisfactory for the purpose intended.

3.4 MECHANICAL REMOVALS

A. Mechanical demolition and removal Work includes dismantling and removing existing fencing, guard rails, steel posts, piping, and appurtenances as shown, indicated, and required for completion of the Work. Mechanical removals include cutting and capping as required.

B. Demolition and Removals of Piping and Similar Items:
   1. Remove to the extent shown or indicated. Remove piping to the nearest solid piping support, and provide caps on ends of remaining piping.
   2. Caps, Closures, Blind Flanges, and Plugs:
      a. Provide closure pieces, such as blind flanges and caps, at all open piping with potential to convey stormwater.
      b. Where used in this Section, the term "cap" means the appropriate type closure for the piping or ductwork being closed, including caps, blind flanges, and other closures.
      c. Caps shall be compatible with the piping or ductwork to which the cap is attached, fluid-tight, and appropriate for the fluid conveyed in the pipe or duct.
      d. Unless otherwise shown or indicated, caps shall be mechanically fastened, fused, or welded to pipe or duct. Plug piping with means other than specified in this Section only when so shown or indicated in the Contractor Documents or when allowed by Oversight Engineer.
   3. When Underground Facilities are altered or removed, properly cut and cap piping left in place, unless otherwise shown or indicated.

C. Other Mechanical Removals:
   1. To the extent shown or indicated, remove existing fencing, guard rails and steel posts.
   2. Remove all fencing, guard rails and steel posts from bases. All fencing shall be disposed of. Guard rails and steel posts shall be free from concrete and other debris and stored.

3.5 ELECTRICAL REMOVALS

A. Electrical demolition Work includes removing light poles, bases and existing conduit.

B. Remove existing electrical equipment and fixtures to avoid damaging systems to remain, to keep existing systems in operation, and to maintain integrity of grounding systems.

C. Cables in conduits to be removed shall be removed back to the power source or control panel, unless otherwise shown or indicated. Verify the function of each cable before disconnecting and removing.

3.6 DISPOSAL OF DEMOLITION DEBRIS

A. Remove from the Site all debris, waste, rubbish, and material resulting from demolition operations and equipment used in demolition Work. Comply with Specification Section 01 74 19 – Off-Site Disposal.

- END OF SECTION -

SECTION 02 50 70

ODOR, VAPOR, AND DUST CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Specified
   1. The control and suppression of odors, vapors, and dust generated during construction activities.
   2. Furnishing all materials, equipment, and labor necessary to control/suppress odors, vapors, and dust generated during construction activities.

B. Related Work Specified Elsewhere
   1. Community Air Monitoring Plan (CAMP)

1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. New York State Department of Environmental Conservation (NYSDEC) DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).
   1. Appendix 1A - New York State Department of Health (NYSDOH) Generic Community Air Monitoring Program
   2. Appendix 1B - Fugitive Dust and Particulate Monitoring

B. Other applicable federal, state, and local air monitoring requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. BioSolve® Hydrocarbon Mitigation Agent

B. AC-645 and AC-667SE Vapor-Suppressant Foams, as manufactured by Rusmar, Inc.

C. Design Engineer approved equals.

2.2 APPLICATION AND ANCILLARY EQUIPMENT

A. Pressure washers (minimum of two) and spray wands operating to the satisfaction to the Oversight Engineer.

B. Three portable polyethylene water storage tanks, each with a minimum capacity of 150 gallons.

C. Pneumatic Foam Unit 400/25, as manufactured by Rusmar, Inc.

D. Design Engineer approved equals.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Community air monitoring for volatile organic compounds (VOCs), hydrogen cyanide, hydrogen sulfide, and particulates will be performed by the Oversight Engineer on a continuous basis during the construction activities. The Contractor shall ensure that community air monitoring is being performed prior to initiating intrusive and/or potential dust-generating activities each day.

B. Real-time work zone air monitoring shall be performed by the Contractor on a continuous basis during all intrusive and/or potential dust-generating activities.

C. Odors shall be controlled to the satisfaction of the Oversight Engineer and New York State Department of Environmental Conservation (NYSDEC). Vapors and dust shall be controlled as necessary to meet the 1) community air monitoring action levels set forth in the CAMP and 2) work zone air monitoring action levels set forth in the Contractor's Health and Safety Plan.

D. The Contractor shall provide and maintain sufficient materials, equipment, and personnel on-site to control odors, vapors, and dust generated during the work. BioSolve®, vapor-suppressant foams (AC-645 and AC-667SE), and appropriate application and storage equipment shall be mobilized to the site prior to initiating any intrusive activities.

E. When not in use, odor, vapor, and dust control measures shall be properly stored at the site in locations approved by the Oversight Engineer and in accordance with manufacturer's recommendations.

3.2 CONTROL MEASURES

A. BioSolve® shall be combined with clean water to create a 6% solution.

B. The Contractor is responsible for maintaining, in the immediate vicinity of the work, a supply of clean water and means of storage/dispersion (e.g., portable water tanks, pressure washers, sprayers, etc.) such that water and/or BioSolve® solution may be immediately applied for odor, vapor, and dust control.

C. As necessary and as required by the Oversight Engineer, BioSolve® solution shall be sprayed on excavation faces, stockpiles of excavated materials, buckets during excavation, and excavated soils when loading transport vehicles.

D. Vapor-suppressant foam (AC-645 or AC-667SE, as appropriate) shall be applied to excavation faces and stockpiles of excavated materials prior to extended work breaks (greater than 30 minutes in duration) and at the end of each work day. Foam shall be applied at a uniform rate to completely cover surfaces to a minimum thickness of 3 inches at loose measurement.

1. AC-645 foam is effective for a period of up to 17 hours and is appropriate for daily work breaks and nightly cover (Monday through Thursday).
2. AC-667SE foam is effective for a period of up to 72 hours and is appropriate for weekend cover (applied Friday afternoons/evenings prior to leaving the site for the weekend).
3. Additional applications (of AC-645 or AC-667SE foam) are required for periods greater than 72 hours. The Contractor shall be prepared to re-apply foam in such instances.

E. The Contractor shall maintain all excavations, embankments, stockpiles, access roads, and other work areas to minimize airborne releases of dust.

F. Other appropriate methods of controlling odors, vapors, and dust include the following:
1. Excavating, loading, handling, and backfilling materials in a manner that minimizes dust generation.
2. Periodic removal of dirt/debris from access roads and active vehicle transportation routes.
3. Spraying water on access roads and active vehicle transportation routes.
4. Hauling excavated materials and clean backfill materials in properly tarped/covered vehicles.
5. Restricting vehicle speeds on access roads and active vehicle transportation routes.
6. Covering excavations and material staging areas with 10-mil polyethylene sheeting (anchored appropriately to resist wind forces) prior to extended work breaks and at the end of each work day.

G. If the Contractor's methods of controlling vapors and dust do not reduce airborne concentrations to acceptable levels, based on visual observations, the results of community air monitoring, and/or the results of work zone air monitoring, work activities shall be suspended until the Contractor implements appropriate corrective measure(s) to remedy the situation.

- END OF SECTION -

SECTION 03 00 05

CONCRETE

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install concrete, reinforcing, and related materials.
   2. The Work includes:
      a. Providing concrete consisting of Portland cement, fine and coarse aggregates, water, and approved admixtures; combined, mixed, transported, placed, finished, and cured.
      b. Fabricating and placing reinforcing, including ties and supports.
      c. Design, erection, and removal of formwork.
      d. Building into the concrete all sleeves, frames, anchorage devices, inserts, and other items required to be embedded in concrete.
      e. Providing openings in concrete as required to accommodate Work under this and other Sections.
   3. Refer to Specification 31 23 10, Fill Materials for all controlled low strength material requirements.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate installation of items to be installed in the concrete Work.

C. Classifications of Concrete:
   1. Class “A” concrete shall be steel-reinforced and includes all concrete unless otherwise shown or indicated.
   2. Class “B” concrete shall be placed without forms or with simple forms, with little or no reinforcing and includes the following:
      a. Concrete fill.
      b. Duct banks.
      c. Unreinforced encasements.
      d. Curbs and gutters.
      e. Sidewalks.
      f. Thrust blocks.

B. Related Sections:
   1. Section 31 23 10, Fill Materials.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. ACI 224R, Control of Cracking in Concrete Structures.
   2. ACI 301, Specifications for Structural Concrete for Buildings.
   3. ACI 304R, Guide for Measuring, Mixing, Transporting and Placing Concrete.
   4. ACI 305R, Specification for Hot Weather Concreting.
   5. ACI 306R, Cold Weather Concreting.
   6. ACI 309R, Guide for Consolidation of Concrete.
   7. ACI 318, Building Code Requirements for Structural Concrete and Commentary.
   8. ACI 347, Guide to Formwork for Concrete.
   9. ACI SP-66, ACI Detailing Manual.
   10. ASTM A82/A82M, Specification for Steel Wire, Plain, for Concrete Reinforcement.
   11. ASTM A185/A185M, Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
   12. ASTM A615/A615M, Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   13. ASTM C31/C31M, Practice for Making and Curing Concrete Test Specimens in the Field.
   14. ASTM C33/C33M, Specification for Concrete Aggregates.
   15. ASTM C39/C39M, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   16. ASTM C42/C42M, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   16. ASTM C94/C94M, Specification for Ready-Mixed Concrete.
   17. ASTM C138/C138M, Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
   18. ASTM C143/C143M, Test Method for Slump of Hydraulic-Cement Concrete.
   19. ASTM C150/C150M, Specification for Portland Cement.
   20. ASTM C172, Practice for Sampling Freshly Mixed Concrete.
   21. ASTM C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   22. ASTM C260, Specification for Air-Entraining Admixtures for Concrete.
   23. ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
   24. ASTM C494/C494M, Specification for Chemical Admixtures for Concrete.
   25. ASTM C579, Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
   26. ASTM C1064/C1064M, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
   27. ASTM D1752, Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
   28. ASTM E96/E96M, Test Methods for Water Vapor Transmission of Materials

29. ASTM E154, Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
30. CRD-C 572, U. S. Army Corps of Engineers Specification for Polyvinylchloride Waterstops.
31. CRSI 1MSP, Manual of Standard Practice.

1.3 QUALITY ASSURANCE

A. Laboratory Trial Batch:
   1. Employ independent testing laboratory experienced in design and testing of concrete materials and mixes to perform material evaluation tests and to design concrete mixes.
   2. Each concrete mix design specified shall be verified by laboratory trial batch, unless indicated otherwise.
   3. Perform the following testing on each trial batch:
      a. Aggregate gradation for fine and coarse aggregates.
      b. Slump.
      c. Air content.
      d. Compressive strength based on three cylinders each tested at seven days and at 28 days.
   4. Submit for each trial batch the following information:
      a. Project identification name and number (if applicable).
      b. Date of test report.
      c. Complete identification of aggregate source of supply.
      d. Tests of aggregates for compliance with the Contract Documents.
      e. Scale weight of each aggregate.
      f. Absorbed water in each aggregate.
      g. Brand, type, and composition of cementitious materials.
      h. Brand, type, and amount of each admixture.
      i. Amounts of water used in trial mixes.
      j. Proportions of each material per cubic yard.
      k. Gross weight and yield per cubic yard of trial mixtures.
      l. Measured slump.
      m. Measured air content.
      n. Compressive strength developed at seven days and 28 days, from not less than three test cylinders cast for each seven day and 28-day test, and for each design mix.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. List of concrete materials and concrete mix designs proposed for use. Include results of tests performed to qualify the materials and to establish the mix designs. Do not start laboratory trial batch testing until this

submittal is approved by Design Engineer.

b. Laboratory Trial Batch Reports: Submit laboratory test reports for concrete cylinders, materials, and mix design tests.

c. Concrete placement drawings showing the location and type of all joints.

d. Drawings for fabricating, bending, and placing concrete reinforcing. Comply with ACI SP-66. For walls and masonry construction, provide elevations to a minimum scale of 1/4-inch to one foot. Show bar schedules, stirrup spacing, adhesive dowels, splice lengths, diagrams of bent bars, arrangements, and assemblies, as required for fabricating and placing concrete reinforcing.

2. Product Data:

a. Manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.

3. Samples:

a. Samples: Submit samples of materials as specified and as otherwise requested by Design Engineer, including names, sources, and descriptions.

B. Informational Submittals: Submit the following:

1. Delivery Tickets: Copies of all delivery tickets for each load of concrete delivered to or mixed at the Site. Each delivery tickets shall contain the information in accordance with ASTM C94/C94M along with project identification name and number (if any), date, mix type, mix time, quantity and amount of water introduced.

2. Site Quality Control Submittals:

a. Report of testing results for testing of field concrete cylinders for each required time period. Submit within 24 hours after completion of associated test. Test report shall include results of all testing required at time of sampling.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Transportation, Delivery, and Handling:

1. Deliver concrete reinforcing products to Site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings on approved Shop Drawings.

2. Materials used for concrete shall be clean and free from foreign matter during transportation and handling, and kept separate until measured and placed into concrete mixer.

3. Implement suitable measures during hauling, piling, and handling to ensure that segregation of coarse and fine aggregate particles does not occur and grading is not affected.

4. Deliver grout materials from manufacturers in unopened containers that bear intact manufacturer labeling.

B. Storage:
   1. Store formwork materials above ground on framework or blocking. Cover wood for forms and other accessory materials with protective, waterproof covering. Provide for adequate air circulation or ventilation under cover.
   2. Store concrete reinforcing materials to prevent damage and accumulation of dirt and excessive rust. Store on heavy wood blocking so that reinforcing does not come into contact with the ground. Space framework or blocking supports to prevent excessive deformation of stored materials.
   3. Store concrete joint materials on platforms or in enclosures or covered to prevent contact with ground and exposure to weather and direct sunlight.
   4. For storage of concrete materials, provide bins or platforms with hard, clean surfaces.

PART 2 – PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Cement: ASTM C150/C150M, Type II.

B. Aggregates: ASTM C33/C33M.
   1. Fine Aggregate: Clean, sharp, natural sand free of loam, clay, lumps, and other deleterious substances. Dune sand, bank run sand, and manufactured sand are unacceptable.
   2. Coarse Aggregate:
      a. Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter.
      b. Coarse aggregate shall comply with the following:
         1) Crushed stone, processed from natural rock or stone.
         2) Washed gravel, either natural or crushed. Slag, pit gravel, and bank-run gravel are not allowed.
      c. Coarse Aggregate Size: ASTM C33/C33M, Nos. 57 or 67, unless otherwise approved by Design Engineer.

C. Water: Clean, potable.

D. Admixtures:
   1. Air-Entraining Admixture: ASTM C260.
   2. Water-Reducing Admixture: ASTM C494/C494M, Type A.
   3. Water Reducing and Set-Adjusting Admixtures: ASTM C494/C494M, Types D and E.
   4. High Range Water-Reducing Admixture: ASTM C494/C494M, Type F/G.
   5. Use only admixtures that have been tested and approved in the mix designs.
   6. Do not use calcium chloride or admixtures containing chloride ions.

2.2 CONCRETE MIX

A. General:
   1. Normal weight: 145 pounds per cubic foot.
   2. Use air-entraining admixture in all concrete. Provide not less than four percent, nor more than eight percent, entrained air for concrete exposed to freezing and thawing, and provide from three to five percent entrained air for other concrete.

B. Proportioning and Design of Class "A" Concrete Mix:
   1. Minimum compressive strength at 28 days: 4,500 psi.
   2. Maximum water-cement ratio by weight: 0.42.
   3. Minimum cement content: 564 pounds per cubic yard.

C. Proportioning and Design of Class "B" Concrete Mix:
   1. Minimum compressive strength at 28 days: 3,000 psi.
   2. Maximum water-cement ratio by weight: 0.50.
   3. Minimum cement content: 517 pounds per cubic yard.

D. Slump Limits:
   1. Proportion and design mixes to result in concrete slump at point of placement of not less than one inch and not more than four inches.
   2. When using high-range water reducers, slump prior to addition of admixture shall not exceed three inches. Slump after adding admixture shall not exceed eight inches at point of placement.

E. Adjustment of Concrete Mixes:
   1. Concrete mix design adjustments may be requested by Contractor when warranted by characteristics of materials, Site conditions, weather, test results, or other, similar circumstances.
   2. Submit for Design Engineer's approval laboratory test data for adjusted concrete mix designs, including compressive strength test results.
   3. Implement adjusted mix designs only after Design Engineer's approval.
   4. Adjustments to concrete mix designs shall not result in additional costs to Owner.

2.3 FORM MATERIALS

A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection. Contractor shall be responsible for designing the formwork system to resist all applied loads including pressures from fluid concrete and construction loads.

B. Smooth Form Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces in accordance with ACI 301.

C. Unexposed Concrete Surfaces: Material to suit project conditions.

D. Provide 3/4-inch chamfer at all external corners. Chamfer is not required at re-entrant corners unless otherwise shown or indicated.

E. Form Ties:
   1. Provide factory-fabricated, removable, or snap-off metal form ties, that prevent form deflection and prevent spalling of concrete surfaces upon removal. Materials used for tying forms are subject to approval of Design Engineer.
   2. Unless otherwise shown or indicated, provide ties so that portion remaining within concrete after removal of exterior parts is at least 1.5 inches from outer surface of concrete. Unless otherwise shown or indicated, provide form ties that, upon removal, will leave a uniform, circular hole not larger than one-inch diameter in the concrete surface.
   3. Ties for exterior walls, below-grade walls, and walls subject to hydrostatic pressure shall be provided with waterstops.
   4. Wire ties are unacceptable.

2.4 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A615/A615M, Grade 60 deformed bars.

B. Welded Wire Fabric: ASTM A185/A185M.

C. Steel Wire: ASTM A82/A82M.

D. Provide supports for reinforcing including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing in place.
   1. Use wire bar-type supports complying with CRSI MSP1 recommendations, except as specified in this Section. Do not use wood, brick, or other unacceptable materials.
   2. For slabs on grade, use precast concrete blocks, four inches square minimum with compressive strength equal to or greater than the surrounding concrete, or supports with sand plates or horizontal runners where base materials will not support chair legs.
   3. For all concrete surfaces where legs of supports are in contact with forms, provide supports having either hot-dip galvanized, plastic-protected, or stainless steel legs in accordance with CRSI MSP1.
   4. Provide precast concrete supports over waterproof membranes.

E. Adhesive Dowels:
   1. Dowels:
      a. Dowel reinforcing bars shall comply with ASTM A615, Grade 60.
   2. Adhesive:
      a. Adhesive system shall use two-component adhesive mix.

b. Epoxy adhesives shall comply with physical requirements of ASTM C881/C881M, Type IV, Grade 2 and 3, Class A, B, and C, except gel times.

c. Adhesives shall have a current evaluation report by ICC Evaluation Service for use in both cracked and uncracked concrete with seismic recognition for SDC A through F as tested and assessed in accordance with ICC-ES AC308.

d. Adhesives shall have minimum bond strength and minimum design bond strength (bond strength multiplied by strength reduction factor) in accordance with Table 05 05 33-A:

TABLE 05 05 33-A:
ADHESIVE BOND STRENGTH [1,2]

Anchor	Uncracked Concrete		Cracked Concrete	
Rod Diameter / Dowel Size	Bond Strength (psi)	Design Bond Strength (psi)	Bond Strength (psi)	Design Bond Strength Jpsi)
3/8-inch / #3	2040	1300	1090	700
1/2-inch / #4	1920	1200	920	560
5/8-inch / #5	1830	1150	710	390
3/4-inch / #6	1760	1050	710	460
7/8inch / #7	1670	900	610	340
1-inch / #8	1650	1050	850	460
- / #9	1900	1000	800	400
1.25-inch/ #10	1580	1000	730	400

Notes:
1. Bond strengths listed for hammer-drilled, dry hole.
2. Bond strengths listed for maximum short term concrete temperature of 110 degrees F and maximum long term concrete temperature of 75 degrees F.

2.5 GROUT

A. Non-shrink Grout:
   1. Pre-packaged, non-metallic, cementitious grout requiring only the addition of water at the Site.
   2. Minimum 28-day Compressive Strength: 7,000 psi.
   3. Products and Manufacturers: Provide one of the following:
      a. NS Grout by Euclid Chemical Company.
      b. Set Grout by Master Builders, Inc.
      c. NBEC Grout by Five Star Products, Inc.
      d. Or equal.

PART 3 – EXECUTION

3.1 INSPECTION

A. Contractor shall examine the substrate and the conditions under which the Work will be performed and notify Oversight Engineer in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 FORMWORK

A. Construct formwork in accordance with ACI 347 such that concrete members and structures are of correct size, shape, alignment, elevation, and position.

B. Provide openings in formwork to accommodate the Work of other trades. Accurately place and securely support items required to be built into formwork.

C. Clean and adjust forms prior to placing concrete. Apply form release agents or wet forms as required. Re-tighten forms during and after concrete placing, when required, to eliminate cement paste leaks.

D. Removing Formwork:
   1. Comply with ACI 301 and ACI 347, except as otherwise indicated in the Contract Documents.
   2. Do not remove formwork and shoring until supported concrete members have acquired minimum of 90 percent of specified compressive strength. Results of suitable quality control tests of field-cured specimens may be submitted to Oversight Engineer for review as evidence that concrete has attained sufficient strength for removal of supporting formwork and shoring prior to removal times indicated in the Contract Documents.
   3. Removal time for formwork is subject to Oversight Engineer's acceptance.
   4. Repair form tie-holes following in accordance with ACI 301.

3.3 REINFORCING, JOINTS, AND EMBEDDED ITEMS

A. Comply with the applicable recommendations of Laws and Regulations and standards referenced in this Section, including CRSI MSP1, for details and methods of placing and supporting reinforcing.

B. Clean reinforcing to remove loose rust and mill scale, earth, ice, and other materials which act to reduce or destroy bond between reinforcing material and concrete.

C. Position, support, and secure reinforcing against displacement during formwork construction and concrete placing. Locate and support reinforcing by means of metal chairs, runners, bolsters, spacers, and hangers, as required.

1. Place reinforcing to obtain minimum concrete coverages as shown on the Drawings and as required in ACI 318. Arrange, space, and securely tie bars and bar supports together with 16-gage wire to hold reinforcing accurately in position during concrete placing. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
2. Do not secure reinforcing to formwork using wire, nails or other ferrous metal. Metal supports subject to corrosion shall not be in contact with formed or exposed concrete surfaces.

D. Provide sufficient quantity of supports of strength required to carry reinforcing. Do not place reinforcing more than two inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

E. Splices: Provide standard reinforcing splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown or indicated for minimum lap of spliced bars, in accordance with the all applicable requirements of ACI.

F. Install welded wire fabric in lengths as long as practical, lapping adjoining sections a minimum of one full mesh.

G. Do not place concrete until reinforcing is inspected and Oversight Engineer indicates that conditions are acceptable for placing concrete. Concrete placed in violation of this paragraph will be rejected. Notify Oversight Engineer in writing at least two working days prior to proposed concrete placement.

H. Joints:
1. Provide construction, isolation, expansion, and control joints as indicated or required. Locate construction joints so as to not impair the strength and appearance of the structure. Place isolation and control joints in slabs-on-grade to stabilize differential settlement and random cracking.
2. In walls, locate joints at a maximum spacing of 40 feet and approximately 12 feet from corners.
3. In foundation slabs and slabs-on-grade, locate joints at intervals of approximately 40 feet.
4. In mats and structural slabs and beams, locate joints in compliance with ACI 224R.
5. Locations of joints shall be in accordance with the Contract Documents and as approved by Design Engineer in the Shop Drawings.
6. Where construction joints are indicated to be roughened, intentionally roughen surfaces of previously-placed concrete to amplitude of 1/4-inch.

I. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to, or supported by, cast-in-

place concrete. Use setting diagrams, templates, and instructions provided under other Sections for locating and setting. Refer to Paragraph 1.1.B of this Section. Do not embed in concrete uncoated aluminum items. Where aluminum items are in contact with concrete surfaces, coat aluminum to prevent direct contact with concrete.

J. Adhesive Dowels:
   1. Adhesive dowels shall be reinforcing bar dowels set in an adhesive in hole drilled into hardened concrete. Comply with adhesive system manufacturer's installation instructions regarding hole diameter, drilling method, embedment depth required to fully develop required tensile strength, and hole cleaning and preparation instructions. Unless more-stringent standards are required by adhesive system manufacturer, comply with the following.
   2. Drill holes to adhesive system manufacturer's recommended diameter and depth to develop required tensile strength. Holes shall not be more than 1/4-inch greater than nominal bar diameter, and hole depth shall not be less than twelve times nominal bar diameter. Hammer-drill holes. Cored holes are not allowed.
   3. Embedment depths shall be based on concrete compressive strength of 2,000 psi when embedded in existing concrete, and 4,000 psi when embedded in new concrete.
   4. Determine location of existing reinforcing steel in vicinity of proposed holes prior to drilling. Adjust location of holes to be drilled to avoid drilling through or damaging existing reinforcing bars only when approved by Oversight Engineer.
   5. Before setting adhesive dowel, hole shall be free of dust and debris using method recommended by adhesive system manufacturer. Hole shall be brushed, with manufacturer-approved brush and blown clean with clean, dry, oil-free compressed air to remove dust and loose particles. Hole shall be dry as defined by adhesive system manufacturer.
   6. Inject adhesive into hole through injection system mixing nozzle and necessary extension tubes, placed to bottom of hole. Withdraw discharge end as adhesive is placed, but keep end of tube immersed to prevent forming air pockets. Fill hole to depth that ensures that excess material is expelled from hole during dowel placement.
   7. Twist dowels during insertion into partially-filled hole to guarantee full wetting of bar surface with adhesive. Insert bar slowly to avoid developing air pockets.

3.4 CONCRETE PLACING

A. Site Mixing: Use drum-type batch machine mixer, mixing not less than 1.5 minutes for one cubic yard or smaller capacity. Increase required mixing time by minimum of 15 seconds for each additional cubic yard or fraction thereof.

B. Ready-Mixed Concrete: Comply with ASTM C94/C94M.

C. Concrete Placing:
   1. Place concrete in a continuous operation within planned joints or sections in accordance with ACI 304R.
   2. Do not begin placing concrete until work of other trades affecting concrete is completed.
   3. Wet concrete and subgrade surfaces to saturated surface dry condition immediately prior to placing concrete.
   4. Deposit concrete as near its final location as practical to avoid segregation due to re-handling or flowing.
   5. Avoid separation of the concrete mixture during transportation and placing. Concrete shall not free-fall for distance greater than four feet during placing.
   6. Complete concrete placing within 90 minutes of addition of water to the dry ingredients.

D. Consolidate placed concrete in accordance with ACI 309R using mechanical vibrating equipment supplemented with hand rodding and tamping, such that concrete is worked around placing and other embedded items and into all parts of formwork. Insert and withdraw vibrators vertically at uniformly-spaced locations. Do not use vibrators to transport concrete within the formwork. Vibration of formwork or placing is not allowed.

E. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.
   1. In hot weather comply with ACI 305R.
   2. In cold weather comply with ACI 306R.

3.5 QUALITY OF CONCRETE WORK

A. Make concrete solid, compact, smooth, and free of laitance, cracks, and cold joints.

B. Concrete for liquid-retaining structures and concrete in contact with earth, water, or exposed directly to the elements shall be watertight.

C. Cut out and properly replace to extent directed by Oversight Engineer, or repair to satisfaction of Oversight Engineer, surfaces that contain cracks or voids, are unduly rough, or are in defective in any way. Patches or plastering are unacceptable.

D. Repair, removal and replacement of defective concrete directed by Oversight Engineer shall be at no additional cost to Owner.

3.6 CURING

A. Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by using moisture-retaining cover or membrane-forming curing compound. Cure

formed surfaces by moist curing until formwork is removed. Provide protection, as required, to prevent damage to exposed concrete surfaces. Total curing period shall not be less than seven days. Curing methods and materials shall be compatible with scheduled finishes.

3.7 FINISHING

A. Slab Finish:
   1. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently. Use a wood float only. Check and level surface plane to a tolerance not exceeding 1/4-inch in ten feet when tested with a ten foot straightedge placed on the surface at not less than two different angles. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, re-float the surface to a uniform, smooth, granular texture. Slab surfaces shall receive a float finish. Provide additional trowel finishing as required in this Section.
   2. After floating, begin first trowel finish operation using power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over the surface.
   3. Consolidate concrete surface by the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8-inch in ten feet when tested with a ten-foot straightedge. Grind smooth surface defects that would telegraph through applied floor covering system.
   4. Use trowel finish for the following:
      a. Interior exposed slabs, unless otherwise shown or indicated.
      b. Apply non-slip broom finish, after troweling, to exterior concrete slab and elsewhere as shown.

B. Apply chemical floor hardener to exposed interior concrete floor areas when cured and dry, in accordance with hardener manufacturer's instructions.

C. Formed Finish:
   1. Provide smooth form concrete finish at exposed surfaces. Use largest practical form panel sizes to minimize form joints. Exposed surfaces include interior water-contacting surfaces of tanks, whether or not directly visible. All surfaces shall be considered as exposed, unless buried or covered with permanent structural or architectural material. After removing forms, patch form tie holes and defects in accordance with ACI 301. Remove fins exceeding 1/8-inch in height. Where surface will be coated or will receive further treatment, remove all fins flush with concrete surface.
   2. Provide rough form finish at all unexposed surfaces. After removing forms, patch form tie holes and defects in accordance with ACI 301. Remove fins exceeding 1/2-inch in height.

3.8 GROUT PLACING

A. Place grout as shown and indicated, and in accordance with grout manufacturer's instructions and recommendations. If grout manufacturer's instructions conflict with the Contract Documents, notify Design Engineer and not proceed until obtaining Design Engineer's clarification.

B. Dry-packing is not allowed, unless otherwise indicated.

C. Manufacturers of proprietary grout materials shall make available upon 72 hours notice the services of qualified, full-time, factory-trained employee to aid in ensuring proper use of grout materials at the Site.

D. Placing grout shall comply with temperature and weather limitations described in Article 3.4 of this Section.

3.9 FIELD QUALITY CONTROL

A. Site Testing Services:
   1. Contractor shall employ independent testing laboratory to perform field quality control testing for concrete. Oversight Engineer will direct where samples are obtained.
   2. Testing laboratory will provide all labor, material, and equipment required for sampling and testing concrete, including: scale, glass tray, cones, rods, molds, air tester, thermometer, and other incidentals required.

B. Quality Control Testing During Construction:
   1. Perform sampling and testing for field quality control during concrete placing, as follows:
      a. Sampling Fresh Concrete: ASTM C172.
      b. Slump: ASTM C143/C143M; one test for each concrete load at point of discharge.
      c. Concrete Temperature: ASTM C1064/C1064M; one for every two concrete loads at point of discharge, and when a change in the concrete is observed. Test each load when time from batching to placement exceeds 75 minutes.
      d. Air Content: ASTM C231; one for every two concrete load at point of discharge, and when a change in the concrete is observed.
      e. Unit Weight: ASTM C138/C138M; one for every two concrete loads at point of discharge, and when a change in the concrete is observed.
      f. Compression Test Specimens:
         1) In accordance with ASTM C31/C31M, make one set of compression cylinders for each 50 cubic yards of concrete, or fraction thereof, of each mix design placed each day. Each set shall be four standard cylinders, unless otherwise directed by Oversight Engineer.

2) Cast, store, and cure specimens in accordance with ASTM C31/C31M.

g. Compressive Strength Tests:
   1) In accordance with ASTM C39/C39M; one specimen tested at seven days, and three specimens tested at 28 days.
   2) Concrete that does not comply with strength requirements will be considered as defective Work.

h. Submit test results from certified by testing laboratory to Oversight Engineer within 24 hours of completion of test.

i. When there is evidence that strength of in-place concrete does not comply with the Contract Documents, Contractor shall employ the services of concrete testing laboratory to obtain cores from hardened concrete for compressive strength determination. Cores and tests shall comply with ASTM C42/C42M and the following:
   1) Testing of Adhesive Dowels: Contractor will employ testing agency to perform field quality control testing of drilled dowel installations. After adhesive system manufacturer's recommended curing period and prior to placing connecting reinforcing, proof-test for pullout ten percent of adhesive dowels installed. Adhesive dowels shall be tensioned to 60 percent of specified yield strength. Where dowels are located less than six bar diameters from edge of concrete, Design Engineer will determine tensile load required for test. If one or more dowels fail, retest all dowels installed for the Work. Dowels that fail shall be reinstalled and retested at Contractor's expense.

- END OF SECTION -

SECTION 26 05 05

GENERAL PROVISIONS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals shown, specified, and required to complete the electrical Work.
   2. Temporary Utilities: Contractor shall provide temporary power and lighting.
   3. Demolition: Electrical demolition shall be in accordance with Section 02 41 00, Demolition.
   4. Utility Companies:
      a. Electric Utility Company: Perform the Work in connection with the electric service and utility metering in accordance with requirements of service provider.
      b. Telephone and Communications Utility Company: Perform the Work in connection with telephone service and communications services in accordance with requirements of service provider.

B. Coordination:
   1. Review installation procedures and schedules under other Specification Sections and coordinate with other trades the installation of electrical items that will be installed with or within formwork, walls, partitions, ceilings, and panels.
   2. Coordination and Intent of Design Drawings:
      a. Dimensions on Drawings related to equipment are based on equipment of certain manufacturers. Verify the dimensions of equipment furnished to space available at the Site and allocated to the equipment.
      b. Design Drawings show the principal elements of the electrical Work, and are not intended as detailed working drawings for the electrical Work. Design Drawings supplement and complement the Specifications and other Contract Documents relative to principal features of electrical systems.
      c. Equipment and devices provided under this Contract shall be properly connected and interconnected with other equipment and devices for successful operation of complete systems, whether or not all connections and interconnections are specifically mentioned or shown in the Contract Documents.
      d. Design Drawings are provided for Contractor's guidance in fulfilling the intent of the Contract Documents. Contractor shall comply with Laws and Regulations, including safety and electrical codes, and provide materials,

equipment, appurtenances, and specialty items necessary for complete and operable systems.

3. Field Coordination:
    a. Provide materials, equipment, and services to interface with existing circuits. Field-verify system and equipment requirements prior to modifying existing systems.
    b. Coordinate the interface of equipment with Oversight Engineer, Krasdale Foods Inc., and field conditions.
    c. Field-compare existing starter and panel control circuit terminations from record documents with existing circuits.
    d. Field-trace existing circuits as required to interface the equipment provided.
    e. Field-identify terminations for starters and panel controls for follow function for re-connection.

C. Related Sections:
1. Section 02 41 00 – Demolition.
2. Section 03 00 05 – Concrete.

D. Work Included in This Contract but Specified Elsewhere:
1. Concrete for pads, light pole bases, manholes, ductbanks, and conduit encasement shall comply with Section 03 00 05 – Concrete.
2. Excavation and filling associated with buried electrical Work shall comply with Division 31.

E. Area Classifications:
1. Materials, equipment, and incidentals shall be suitable for the area classification(s) shown, specified, and required.
2. Wet Locations: Comply with NEC and NEMA requirements for wet locations. Enclosures in wet locations shall comply with NEMA 4 unless specified otherwise.
3. Corrosive Locations: Comply with NEC and NEMA requirements for corrosive locations. Enclosures in corrosive locations shall conform to NEMA 4X requirements unless specified otherwise.
4. Hazardous Locations: Comply with NEC requirements for the Class and Division designated.
5. Dusty Locations: Indoor areas not designated as hazardous, corrosive, or wet are dusty locations. Comply with NEC and NEMA 12 requirements unless specified otherwise.

1.2 QUALITY ASSURANCE

A. Qualifications:
1. Electrical Subcontractor:

a. Electrical Subcontractor shall have not less than five years experience installing electrical systems of the types required for the Project.
b. Electrical Subcontractor shall possess a valid electricians' and contractors' license in the jurisdiction where the Site is located.
c. Submit the following information for not less than three successful, completed projects: project name and location; year completed; name and contact information for: prime contractor for whom electrical Subcontractor worked, project owner, and design engineer or architect, including addresses and telephone numbers.

2. Wiring Coordinator:
   a. Retain services of a wiring coordinator who shall prepare complete point-to-point interconnection wiring diagrams. Diagrams shall identify all external interconnecting wiring associated with new or modified existing equipment.
   b. Qualifications: Wiring coordinator shall be experienced in developing diagrams of the type required and shall have served in a similar wiring coordinator role on a completed project of similar size and complexity to the Project.
      1) Submit qualifications and approach for the Project not later than the pre-submittal conference.
      2) Submit to Design Engineer the items indicated below not less than three weeks prior to the pre-submittal conference:
         a) List of projects where the wiring coordinator developed point-to-point wiring diagrams.
         b) Samples of diagrams developed for the listed projects.
         c) Example wiring diagram proposed for the Project with a preliminary list of drawings to be produced.
         d) Plan of how information will be obtained and documented.
   c. Responsibilities:
      1) Develop diagrams for performing the Work and to document terminations.
      2) Use information obtained from approved Shop Drawings and approved submittals, record drawings, and field inspections as required to complete the diagrams.
      3) Attend meetings for all relevant coordination necessary to complete work.

B. Component Supply and Compatibility:
   1. Materials and equipment similar to each other shall be from the same manufacturer for uniformity.

C. Regulatory Requirements:
   1. Permits: Refer to the the Contract Documents for responsibilities relative to obtaining and paying for permits, licenses, and inspection fees.

1.3 SUBMITTALS

A. General:
   1. To the extent practical, submit Shop Drawings and other Contractor submittals for each Specification Section into the smallest number of submittals possible. Do not furnish partial submittals.
   2. Review of equipment submittals does not relieve Contractor of responsibility for providing complete and successfully operating systems.

B. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Internal wiring diagram and drawings indicating all connections to components and numbered terminals for external connections.
      b. Dimensioned plan, section, elevations, and panel layouts showing means for mounting, conduit connection, and grounding.
      c. List of components including manufacturer's name and catalog number (or part number) for each.
   2. Product Data:
      a. Manufacturer's name and product designation or catalog number.
      b. Electrical ratings.
      c. Manufacturer's technical data and specifications.
      d. Manufacturer's indication of compliance with applicable reference standards.
      e. Painting and coating systems proposed.
   3. Test Procedures: Proposed testing procedures and testing limitations for source quality control testing and field quality control testing.

C. Informational Submittals: Submit the following:
   1. Manufacturer's Instructions:
      a. Installation data and instructions.
      b. Instructions for handling, starting-up, and troubleshooting.
   2. Source Quality Control Submittals: Results for required shop testing.
   3. Field Quality Control Submittals: Results for required field testing.
   4. Qualifications:
      a. Electrical Subcontractor.
      b. Wiring coordinator, including information required of wiring coordinator in Paragraph 1.2.A of this Section.

D. Closeout Submittals: Submit the following:
   1. Record Documentation:
      a. System Record Drawings: Include the following:
         1) One-line wiring diagram of the electrical distribution system.
         2) Actual, in-place conduit and cable layouts with schedule of conduit sizes and number, and size of conductors.

3) Layouts of the power and lighting arrangements and the grounding system.
4) Control schematic diagrams, with terminal numbers and control devices identified, for all equipment.

b. Point-to-Point Interconnection Wiring Diagram Drawings: Include the following:
1) External wiring for each piece of equipment, panel, instrument, and other devices and wiring to control stations, lighting panels, and motor controllers.
2) Numbered terminal block identification for each wire termination.
3) Identification of the assigned wire numbers for all interconnections.
4) Identification of wiring by the conduit tag in which the wire is installed.
5) Terminal, junction, and pull boxes through which wiring is routed.
6) Identification of equipment and the submittal transmittal number for equipment from which wiring requirements and termination information was obtained.

c. Record documents shall indicate final equipment and field installation information.

PART 2 – PRODUCTS

A. Performance Criteria:
1. Electrical equipment shall be capable of operating successfully at full-rated load, without failure, with ambient outside air temperature of -20 degrees F to 120 degrees F.
2. Unless specified otherwise, electrical equipment shall have ratings based on 75 degrees C terminations.

B. Testing Laboratory Labels: Electrical material and equipment shall bear the label of Underwriters' Laboratories, Inc. or other nationally recognized, independent testing laboratory, where standards have been established and label service applies.

C. Conduit types and the installation methods shall comply with the following, unless otherwise shown or indicated in the Contract Documents:
a. Use PVC-coated rigid steel conduit for individual conduits direct-buried in the ground or just rigid steel for encased in concrete.
b. Acceptable manufacturers for rigid steel conduit, elbows and couplings:
1) Allied Tube and Conduit.
2) Wheatland Tube Company.
3) Western Tube and Conduit Corporation.
4) Or equal.
c. Material: Rigid, heavy-wall, mild steel, hot-dip galvanized, smooth interior, tapered threads and carefully reamed ends; 3/4-inch NPS minimum size.

d. Acceptable manufacturers for PVC-coated rigid steel conduit, elbows, and couplings:
   1) Robroy Industries.
   2) Perma-Cote Industries.
   3) OCAL, Inc.
   4) Or equal.
e. Material: Rigid, heavy-wall, mild steel, hot-dip galvanized, smooth urethane interior coating, tapered threads, carefully reamed ends, 3/4-inch NPS minimum size with factory exterior coating of 40-mil thick PVC. Color of coating shall be same on all conduit and fittings.

D. Conductors and Cables shall be insulated for use in circuits located outdoors.
   a. Acceptable manufacturers
      1) Southwire.
      2) The Okonite Company.
      3) American Insulated Wire.
      4) General Cable.
      5) Or equal.
   b. Material: Single conductor copper cable complying with ASTM B3 and ASTM B8 with flame-retardant, moisture- and heat-resistant insulation rated for 90 degrees C in dry or wet locations, listed by UL as Type XHHW-2 or RHW-2 complying with UL 44.
   c. Wire Sizes: Not smaller than No. 12 AWG for power and lighting and No. 14 AWG for 120-volt control circuits.
   d. Stranding: 600-volt cable shall be stranded, except that solid cable, No. 10 and smaller may be used for lighting circuits.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine conditions under which Work will be performed and notify Oversight Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:
   1. Install materials and equipment in accordance with the Contract Documents, Laws and Regulations, approved (and accepted, as applicable) Shop Drawings and other Contractor submittals, and manufacturer's recommendations.
   2. Provide tools and equipment required to trace circuits necessary for proper execution of the Work.

3. Define and identify all wiring, circuit terminations, and equipment to be modified to ensure proper interface of components. The Contract Price includes all costs associated with field services specified for a complete and functional system.

B. Staging, Sequencing, and Coordination with Existing Facilities:
   1. Schedule, sequence, and install materials and equipment in accordance with Owner's Operations
   2. Perform the Work in a manner that will not interfere with the existing equipment and facilities or cause interruption of the functions of the Site, unless specified otherwise or otherwise allowed by Owner.
   3. When operation of existing facilities and Site is disrupted due to Contractor's operations, coordinate with Owner's Operations.
   4. Where the Work ties in with existing installations, take precautions and provide safeguards in connecting the Work to existing operating circuits to prevent interruption to existing circuits. Connection of Work to existing circuits shall be performed in the presence of Owner and Oversight Engineer.
   5. Interruptions of existing circuits shall be coordinated with the Owner who will determine the length of time a circuit may be de-energized to maintain the Owner's processes in dependable and safe operation.

3.3 FIELD QUALITY CONTROL

A. Field Quality Control – General:
   1. Perform field quality control for electrical Work in accordance with the Contract Documents.

B. Site Tests:
   1. Prior to requesting certificate of Substantial Completion, demonstrate to Oversight Engineer that electrical systems and electrically-operated equipment installed or modified under the Contract operates in accordance with the Contract Documents and operates as required
   2. Perform the following operational tests on electrical systems:
      a. Operate power circuits to verify proper operation and connection to electrical systems materials and equipment, including mechanical key-interlocks for circuit breakers.
      b. Remove and re-apply power supply to automatic transfer equipment to verify operation. Activate standby power systems to verify their automatic start-up, proper de-energization, and cool down upon resumption of normal power supply.
      c. Operate control circuits, including pushbuttons, indicating lights, and similar devices, to verify proper connection and function. Operate all devices, such as pressure switches, flow switches, and similar devices, to verify that shutdowns and control sequences operate as required.

d. Operate lighting systems and receptacle devices to verify proper operation and connections.

3. Prepare and submit report on the equipment demonstration and operating field quality control tests. Report shall include complete information on the tests performed and results.

C. Manufacturer's Services:

1. Furnish at the Site qualified, factory-trained representative(s) of equipment manufacturers for the services indicated in the Contract Documents.

- END OF SECTION -

SECTION 31 05 19

GEOSYNTHETICS

PART 1 – GENERAL

1. 1 WORK SPECIFIED

A. The Contractor will supply all labor, materials, tools and equipment required to furnish and install geosynthetics as shown on the Design Drawings.

1.2 SUBMITTALS

A. Contractor shall submit Manufacturer's specifications for all geosynthetics to the Design Engineer at least 2 weeks prior to planned use for review and approval.

B. Written certification that the specifications for the materials specified in this Article 2.2 of this Section are guaranteed by the manufacturer.

C. Results of QC tests conducted by the manufacturer. QC test results shall include lot and roll identification numbers representative of the field-delivered material.

D. Contractor's written certification that the field-delivered material meets the manufacturer's specifications.

E. Contractor's written certification (provided prior to installation) that the field-delivered geotextiles have not been damaged due to improper transportation, handling, or storage.

1. 3 RELATED DOCUMENTS

A. ASTM International (ASTM). The following ASTM specifications are referred to in this Specification and are considered part of this Specification:

D638	Tensile Properties of Plastics
D792	Specific Gravity and Density of Plastics by Displacement
D1004	Initial Tear Resistance of Plastic Film and Sheeting
D1505	Density of Plastics by the Density Gradient Technique
D1603	Carbon Black Content in Olefin Plastics
D4218	Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique
D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
D4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles
D5397 Environmental Stress-Cracking of Ethylene Plastics
D5994 Core Thickness of Textured Geomembrane
D5596 Microscopical Examination of Pigment Dispersion in Plastic Compounds
D5641 Geomembrane Seam Evaluation by Vacuum Chamber
D5820 Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
D6365 Non-destructive Testing of Geomembrane Seams using the Spark Test
D6693 Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

B. American Association of State Highway and Transportation Officials (AASHTO). The following AASHTO specification is referred to in this Specification and is considered part of this Specification:
M 288 Standard Specification for Geotextile Specification for Highway Applications

1.4 DELIVERY, STORAGE AND HANDLING

A. The geosynthetic will be furnished in a protective wrapping labeled with the following information: Manufacturer's name, product identification, lot number, roll number and dimensions.

B. The geosynthetic will be protected from ultraviolet light, precipitation, mud, soil, excessive dust, puncture, cutting and/or other damaging conditions prior to and during delivery and on-site storage. The geosynthetic will be shipped and stored in relatively opaque and watertight wrappings. The geosynthetic will be stored on site at a location subject to review and acceptance by the Oversight Engineer.

C. Materials will be deployed only after the required submittals have been received and reviewed by the Design Engineer.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. SKAPS Industries

B. TenCate Mirafi

C. U.S. Fabrics

D. Or Design Engineer approved equal.

2.2 GEOSYNTHETICS

A. Geotextile/geosynthetics. For these Specifications and the Design Drawings, the terms "geotextile" and "geosynthetics" will be considered synonymous and flexible membrane liner (FML) will be considered synonymous with textured high-density polyethylene liner.

B. Nonwoven geotextile. Needle-punched geotextile, manufactured for subsurface drainage applications, made from polypropylene fibers, with elongation greater than 50 percent. Complies with AASHTO M 288 and the following, measured per test methods referenced:
   1. Survivability: Class 2; AASHTO M 288
   2. Grab Tensile Strength: 205 lbf (900 N); ASTM D4632
   3. Tear Strength: 80 lbf (360 N); ASTM D4533
   4. Puncture Strength: 130 lbf (580 N); ASTM D4833
   5. Apparent Opening Size: No.80 (0.180-mm) sieve, maximum; ASTM D4751
   6. Permittivity: 0.21 per second, minimum; ASTM D4491
   7. Weight: 8.2 ounces per square yard (oz/yd^2), minimum (unless otherwise noted on the Design Drawings); ASTM D5261

C. Woven geotextile. Manufactured for separation applications, made from polypropylene, with elongation less than 20 percent. Complies with AASHTO M 288 and the following, measured per test methods referenced:
   1. Survivability: Class 2; AASHTO M 288
   2. Grab Tensile Strength: 315 lbf (1400 N); ASTM D4632
   3. Tear Strength: 120 lbf (530 N); ASTM D4533
   4. Puncture Strength: 120 lbf (530 N); ASTM D4833
   5. Apparent Opening Size: No. 40 (0.425-mm) sieve, maximum; ASTM D4751
   6. Permittivity: 0.05 per second, minimum; ASTM D4491
   7. UV Stability: 70 percent after 500 hours' exposure; ASTM D4355
   8. Weight: 6 oz/yd^2, minimum (unless otherwise noted on the Design Drawings); ASTM D5261

D. Woven geotextile. Manufactured for riprap filter layer applications, made from polypropylene, with elongation less than 20 percent. Complies with AASHTO M 288 and the following, measured per test methods referenced:
   1. Tensile Strength (at ultimate): 4800 lbf (70.0 kN/); ASTM D4595
   2. Tensile Strength (at 2% strain): 960 lbf (14.0 kN/); ASTM D4595
   3. Tensile Strength (at 5% strain): 2400 lbf (35.0 kN/); ASTM D4595
   4. Tensile Strength (at 10% strain): 4800 lbf (70.0 kN/); ASTM D4595
   5. Apparent Opening Size: No. 30 (0.60-mm) sieve, maximum; ASTM D4751

6. Permittivity: 0.40 per second, minimum; ASTM D4491
7. UV Stability: 80 percent after 500 hours' exposure; ASTM D4355
8. Weight: 14 oz/yd^2, minimum (unless otherwise noted on the Design Drawings); ASTM D5261

E. Geogrid. Tensar TriAx TX7 or approved equal. Manufactured using select grades of polypropylene or copolymers that resist high, short-term dynamic loads or moderate loads over longer time periods. These products carry loads applied in any direction in the plane of the geogrid and the following::
1. Rib Pitch (mm): 40
2. Mid-rib transverse depth (mm): 1.6
3. Mid-rib transverse width (mm): 1.4
4. Rib shape: rectangular
5. Aperture shape: triangular
7. UV Stability: 100 percent after 500 hours' exposure; ASTM D4355

F. FML. Manufactured from high quality high density polyethylene resins with carbon black, antioxidants, and UV stabilizers added for long term performance and UV resistance. The material shall meet the specification values listed below, measured per test methods referenced:
1. Density (min. avg.): 0.940 g/cc ; D1505/D792
2. Carbon Black Content (range): 2.0 - 3.0 percent; ASTM D1603/ D4218
3. Carbon Black Dispersion: 9 of 10 views in Categories 1 or 2 and 1 of 10 views in Category 3; ASTM D5596
4. Thickness (nominal): 40 mil (1.0 mm); ASTM D5994
5. Tensile Strength at Break (min. avg.): 75 lb/in (13 N/mm); ASTM D6693/D638 Type IV
6. Elongation at Break (min. avg.): 100 percent; ASTM D6693/D638 Type IV
7. Tear Resistance (min.): 32 lb (142 N); ASTM D1004
8. Puncture Resistance (min.): 95 lb (422 N); ASTM D4833
9. Stress Crack Resistance; 300 hours; ASTM D5397

2.3 QUALITY ASSURANCE

A. The field-delivered geosynthetic will meet the specification values according to the Manufacturer's specification sheet.

B. The Manufacturer will have in place its own quality assurance program in the manufacture of the geosynthetic.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to installing the geosynthetic, any soil surface to be covered with geosynthetic will be leveled and uniformly compacted, as necessary, to provide a stable interface for the geosynthetic that is as smooth as possible. To the extent practicable, rocks or debris that may compromise the geosynthetic must be removed prior to geosynthetic installation.

3.2 GEOTEXTILE INSTALLATION

A. The following procedures and requirements will be followed during the geosynthetic installation:
   1. Placement:
      a. Placement of the geosynthetic will not be conducted during adverse weather conditions. The geosynthetic will be kept dry during storage and up to the time of deployment. During windy conditions, all geosynthetics will be secured with sandbags or an equivalent approved anchoring system. Removal of the sandbags or equal will only occur upon placement of an overlying soil layer.
      b. Proper cutting tools will be used to cut and size the geosynthetic materials. The proper PPE, as defined in the Contractors' Health and Safety Plan, will be worn by contract employees. Care will be exercised while cutting geosynthetics.
      c. During the placement of geosynthetics, all dirt, dust, sand and mud shall be kept off of the material to prevent clogging. If excessive amounts of such materials are present on the geosynthetic, the geosynthetic will be cleaned or replaced to the satisfaction of the Owner and/or Oversight Engineer.
      d. The Geosynthetic will be covered within the time period recommended by the manufacturer, and in no case later than 2 weeks after its placement.
      e. In general, seams on slopes will be parallel to the line of slope.
   2. Seaming and repairing:
      a. Adjacent panels of geotextile will be overlapped a minimum 6 inches for woven, 12 inches for nonwoven, and 36 inches for geogrid geotextiles.
      b. Repair of tears or holes in the geotextile will require the following procedures:
         i. On slopes. A patch made from the same geotextile will be double seamed into place; with each seam ¼- to ¾-inch apart and no closer than 1 inch from any edge. If any tear exceeds 10 percent of the width of the roll, that roll will be removed from the slope and replaced.
         ii. Nonslopes. A patch made from the same geotextile will be spot-seamed in place with a minimum 24-inch overlap in all directions.
      c. FML seaming shall primarily be performed using automatic fusion welding equipment and techniques. Extrusion welding shall be used

where fusion welding is not possible, such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.

i. The FML shall be overlapped prior to seaming in accordance with the manufacturer's installation guidelines, or as required to affect a good weld and allow for proper testing. In no case shall this overlap be less than 3 inches.

ii. The area of FML to be seamed shall be cleaned and prepared according to the procedures specified by the material manufacturer. Any abrading of the FML shall not extend more than ½ inch on either side of the weld. Care shall be taken to eliminate or minimize the number of wrinkles and fishmouths resulting from seam orientation.

d. Nondestructive FML seam testing:

i. Nondestructive seam testing shall be performed by the FML installer on 100 percent of field seams over the full seam length before the seams are covered.

ii. Testing shall be performed as the seaming work progresses, not at the completion of all field seaming, unless agreed to in advance by the Design Engineer. All defects found during testing shall be numbered and marked immediately after detection. All defects found shall be repaired, retested and remarked to indicate acceptable completion of the repair.

iii. Nondestructive testing shall be performed using vacuum box, air pressure or spark testing equipment.

iv. Nondestructive tests shall be performed by experienced technicians familiar with the specified test methods. The FML installer shall demonstrate all test methods to the Oversight Engineer to verify that the test procedures are valid.

3. Double fusion seams with an enclosed channel shall be air pressure tested by the FML installer in accordance with ASTM D5820.

4. Extrusion seams shall be vacuum box tested by the FML installer in accordance with ASTM D5641.

- END OF SECTION -

SECTION 31 23 00

EXCAVATION AND DEWATERING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Specified
   1. All labor, materials, services and equipment necessary to complete the earthwork required for completion of the work as specified herein.

B. Related Sections
   1. Section 31 50 00 – Excavation Support
   2. Section 31 23 10 – Fill Materials
   3. Section 02 50 70 – Odor, Vapor and Dust Control

1.2 SUBMITTALS

A. Excavation Plan. The Contractor shall submit an Excavation Plan (to be included as a part of the Contractor's Operations Plan) to the Design Engineer for review prior to the start of work. The Contractor shall submit the written plan demonstrating compliance with OSHA 29 CFR Part 1926.650 to the Design Engineer for approval before implementation in accordance with Section 01 71 03 – Mobilization Demobilization. The information presented in the Excavation Plan shall include, but not be limited to, the following.
   1. Excavation method(s).
   2. Copies of required permits and approvals, from authorities having jurisdiction and affected utility owners, for excavation methods proposed.
   3. Detailed excavation sequencing plan and rationale for selected sequence.
   4. Describe all equipment to be used to remove, transport and dispose of excavated materials, construction debris, and cleared vegetation; provide a schedule for operations.
   5. Describe excavation equipment to be used, including quantity and type.
   6. Provide procedures for field verification.
   7. Present estimated daily production rates.

B. The Contractor shall submit the following information related to the water management system:
   1. Cut sheets and technical details for each system component and media.
   2. Equipment size, dimensions, and materials of construction for all system components.
   3. Pumping and piping types, sizes, and connections.
   4. Electrical requirements and service connections (as required).
   5. Monitoring and maintenance requirements for system components.

6. Water Management Start-up and Monitoring Plan

C. The Contractor shall maintain (throughout the Project) a written record of the operation and maintenance activities associated with the water management system. Such information shall be tabulated, updated daily, and submitted on a weekly basis to the Oversight Engineer for review. At a minimum, the summary shall include the following information (for each day):
   1. Volume of water extracted and managed for off-site treatment and disposal.
   2. Disposal facility used for off-site treatment and disposal.
   3. Type and frequency of monitoring and maintenance activities (if any).
   4. Other information relevant to the operation, monitoring, and maintenance of the water management system.

1.3 DEFINITION

A. Earthwork – Includes, but is not limited to, clearing, topsoil removal and storage, pavement removal, classified and unclassified excavation for structures and trenches, handling and disposal of surplus materials, maintenance of excavations, backfilling operations, rough grading.

B. Earth – All materials, such as sand, gravel, sediment, clay, loam, ashes, cinders, pavements, muck, roots, pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders, masonry, or debris larger than ½ cubic yard in volume.

C. Backfill – The refilling of excavated areas to the elevations indicated on the Design Drawings using specified materials for refilling of excavated areas; and the compacting of all materials used in filling or refilling by rolling, ramming, or as may be required and approved by the Owner.

PART 2 - PRODUCTS

2.1 EXCAVATION SUPPORT

A. Requirements for excavation support are provided in Section 31 50 00.

2.2 WATER MANAGEMENT SYSTEM COMPONENTS

A. Equalization weir tanks, minimum of two, shall be 18,100 gallon capacity steel tank equipped with “over and under” style weir.

B. Pumps shall consist of Power Prime DV-80 pump (or equivalent) equipped with 3-inch inlet and 3-inch outlet. Pump shall be capable of operating at 150 gallons per minute (gpm) at 100 feet of total dynamic head (TDH).

C. Bag filters shall be two skid mounted Rosedale 82-30-3F-1-150-SBSPB units rated for 150 gpm each (or equivalent).

D. Effluent holding tanks, minimum of four, shall be 21,000 gallon steel frac tanks.

E. Sample taps shall consist of a ½-inch diameter PVC pipe extension with ½-inch ball valve. Sample taps shall be installed to sample the influent and effluent of the system. The influent sample location shall be located at the influent line leading into the influent tank and the effluent sample location shall be located at the effluent discharge line.

F. Pressure gauges shall be a Wika Type 232.34 Part 4332696 with range from 0-120 psi.

G. Flow meter shall be a Badger 4" Recordall Turbo 1000 meter (or equivalent) with a Badger Model Er-10 Battery Powered Display.

H. Portable containment systems shall consist of Rain for Rent Spill Guard portable berms (or equivalent). All WWTS equipment shall be contained within

2.3 ODOR, VAPOR AND DUST CONTROL

A. Requirements for odor, vapor and dust control measures are provided in Section 02 50 70.

PART 3 - EXECUTION

3.1 PAVEMENT REMOVAL

A. Existing pavement to be removed shall be saw cut and removed such that the integrity of pavements to remain is protected.

B. Pavements covering areas to be excavated shall be broken up, removed and then disposed of in accordance with Article 3.05 Surplus Material.

3.2 TRENCH EXCAVATION

A. Trench excavations shall be carried to the lines and subgrades shown on the Drawings.

B. The Contractor is responsible for excavation of all material encountered. Trench widths for pipes shall be held within the maximum limits shown on the Design Drawings.

C. All dewatering, stabilization, mixing, segregation, and/or downsizing of excavated materials shall be conducted within the limits of the excavation.

D. All excavated material shall be directly loaded into appropriate vehicles for off-site treatment and/or disposal. No excavated material shall be staged directly on the ground, or on plastic sheeting placed on the ground.

E. Excavation shall be such that a flat bottom trench of allowable width is established at the required subgrade elevation for subsequent installation of pipe foundation material.

F. If indicated on the Design Drawings or when required as a result of unsuitable soil conditions, trench excavation shall be carried below the required subgrade and a special pipe foundation installed.

G. In any event, the Contractor's operations shall result in stable trench walls and a stable base, in accordance with trench width requirements.

H. Trenches that must remain open overnight shall be maintained in accordance with Article 3.7 of this Section.

3.3 UNAUTHORIZED EXCAVATION

A. The Contractor shall not be entitled to any compensation for excavation carried beyond or below the lines and subgrades prescribed in the Contract Documents. The Contractor shall refill such unauthorized excavations at his own expense and in conformance with the following provisions of this subsection.

B. Should the Contractor, through negligence or for reasons of its own, carry its excavation below the designated subgrade, CLSM as specified in the Section 31 23 10 Fill Materials shall be furnished and placed as backfill in sufficient quantities to reestablish the required subgrade surface. The cost of any tests required as a result of this refilling operation shall be borne by the Contractor.

3.4 SURPLUS MATERIAL

A. All excavated material shall be transported for off-site treatment and/or disposal in accordance with Section 01 74 19 – Off-Site Disposal.

B. Surplus select fill shall be transported for off-site disposal or returned to the source. The Contractor shall make all arrangements for disposal sites, unless the Owner designates special locations. All expenses for hauling and disposal shall be borne by the Contractor. Bidders shall investigate all aspects of surplus material disposing operations.

C. Vehicles used to haul soft or wet material over streets or pavements shall be sufficiently tight to prevent material leakage on the streets or pavements. In all cases where any materials are dropped from the vehicles of the Contractor, the Contractor

shall clean up the same immediately and keep crosswalks, street and pavements clean and free from debris.

D. Prior to disposal of surplus imported material at any off-site location, the Contractor shall obtain a written agreement between its and the owner of the property on which the disposal of the material is proposed. The agreement shall state that the owner of the property gives permission for the Contractor to enter and deposit material of a particular classification on the owner's property at no expense to the project Owner, and shall include any other conditions pertinent to the situation as agreed upon by each party. A copy of such agreement shall be promptly furnished to the Owner.

3.5 ODOR, VAPOR AND DUST CONTROL

A. Requirements for odor, vapor and dust control are presented in Section 02 50 70.

3.6 MAINTENANCE OF EXCAVATIONS

A. All excavations shall be properly and legally maintained while open and exposed.

B. All excavations shall be enclosed with suitably supported temporary fencing.

C. Sufficient and suitable barricades, warning lights, flood lights, signs, etc. to protect the public shall be installed and maintained at all times until the excavation has been backfilled and graded to a safe and satisfactory condition.

D. All barricades, signs and markers shall be reflective. They shall also conform to the requirements of the NYSDOT Manual of Uniform Traffic Control Devices.

3.7 REMOVAL OF WATER

A. Upon entering a project site, the Contractor shall assume responsibility for site surface and subsurface drainage and shall maintain such drainage in an acceptable manner during the life of this contract.

B. The Contractor shall provide, maintain, and operate pumps and related equipment, including standby equipment of sufficient capacity to keep all excavations and trenches and the immediate vicinity thereof free of all water, ice and snow during pipe installation, and are safe from damage, flotation, settlement, or displacement. Under no conditions shall water be allowed to rise in an unbackfilled trench, after pipe has been placed.

C. The Contractor shall provide all supervision, labor, material and equipment necessary to promptly and properly remove all accumulated water, ice and snow, as well as construct and subsequently maintain all drains, ditching, sluiceways, pumping, bailing, wicking, sumps, wells, well points, cut-off trenches, curtains, sheeting and

other appurtenances and structures required to obtain and maintain a dry excavation, as may be necessary to construct the project.

D. The Contractor shall perform all work necessary to keep excavations and areas to be filled free of all groundwater, all surface waters, all supply water and all wastewater.

E. The Contractor shall maintain groundwater in or below the bearing strata at a safe level by methods which prevent loss of fines, which preserve the undisturbed state of subgrade soils and which sufficiently lowers the groundwater level in permeable strata at or below excavation and fill levels such that pumping, blowing, or otherwise unstable conditions do not develop in the bottom or sides of excavations or fill areas.

F. Subgrade soils which become disturbed, or otherwise unsatisfactory for support of structures, fills, or pipeline construction as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced at no additional cost to the Owner.

G. The Contractor shall protect all adjacent structures, whether existing or under construction, from settlement or other adverse effects resulting from his water removal or dewatering methods.

H. Where suitable construction conditions cannot be obtained by other methods, the Contractor shall arrange to install and operate a subsurface dewatering system to drain the construction area.

I. The Contractor shall be responsible for protecting public as well as private water supplies within the zone of influence of any water removal or dewatering system which is required.

J. Temporary water supplies shall meet the requirements of local and state health departments or other regulatory agencies.

K. Installation and approvals of any temporary water supply system and/or source shall be at the Contractor's expense.

L. All water generated during the construction activities during excavation dewatering, decontamination, etc. shall be managed via the on-site water management system.

M. No water will be permitted to be discharged as overland flow.

N. No groundwater shall be discharged to sanitary sewers.

O. Sewage encountered in earthwork operations must be disposed of in a manner satisfactory to the local Public Health Officer, if sanitary sewers are not available.

3.8 WATER MANAGEMENT SYSTEM OPERATION, MONITORING, AND

MAINTENANCE

A. System Operations and Project Coordination – The Contractor shall be responsible for operating the water management system in accordance with specific operating procedures related to the individual system components, the Contractor's other operations within the Project Construction Area, and this Design. The Contractor shall closely coordinate and monitor the system operations with respect to potential impacts and disruptions to the overall Project implementation. Under no circumstances shall the Contractor exceed the storage capacity of the Equalization Tank(s).

B. The Contractor shall continuously monitor the operation of the water management system (especially during winter months) and at no time leave the system operating without qualified attending personnel present within the Project Construction Area. If the Contractor elects to operate the water management system on a continuous basis during non-working hours, such a plan must be formally communicated (in writing) to the Owner and Oversight Engineer for review and approval.

C. As required, the Contractor shall perform routine maintenance of the water management system. During such times, the Contractor shall coordinate its activities to minimize interruption to the overall Project implementation.

D. Following conclusion of the water management system operations, the Contractor shall clean/decontaminate all equipment in accordance with the provisions of the Design and per the vendor/supplier requirements.

3.8 SHEETING AND BRACING

A. Sheeting and bracing requirements shall be in accordance with Section 31 50 00.

3.9 BACKFILL MATERIALS

A. Granular materials and CLSM required for filling, backfilling, bedding, subbase and other purposes shall be as shown on the Design Drawings. Requirements for fill materials are specified in Section 31 23 10 and on the Design Drawings as appropriate.

3.10 GENERAL BACKFILLING REQUIREMENTS

A. Backfilling shall be started as soon as practicable and after structures or pipe installations have been completed and inspected, and/or concrete has acquired a suitable degree of strength.

B. Backfilling shall be carried on expeditiously thereafter.

C. Backfill shall be started at the lowest section of the area to be backfilled.

D. Natural drainage shall be maintained at all times.

E. Areas to be backfilled shall be inspected by the Oversight Engineer prior to backfilling operations, and all unsuitable materials, including sheeting, bracing, forms and all other deleterious debris, shall be removed by the Contractor, as requested.

F. Backfill material shall be inspected by the Oversight Engineer prior to placement and all roots, vegetation, organic matter, or other foreign debris shall be removed.

G. Stones larger than 12 inches in any dimension shall be removed.

H. Stones shall not be allowed to form clusters with voids.

I. Backfill material shall not be placed when moisture content is too high to allow proper compaction.

J. When material is too dry for adequate compaction, water shall be added to the extent necessary.

K. No backfill material shall be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments when placed.

L. No calcium chloride or other chemicals shall be added to prevent freezing.

M. Material incorporated in the backfilling operation which is not in satisfactory condition shall be subject to rejection and removal at the Contractor's expense.

N. If the Contractor fails to stockpile and protect on-site excavated material acceptable for backfill, then the Contractor shall provide an equal quantity of acceptable off-site material at no expense to the Owner.

O. Material shall be placed and compacted in 1-foot lifts.

P. In-place density tests are to be performed at a frequency of one per 200 cubic yards of general fill placed or 75 linear feet of pipeline backfilled for each lift placed or to reliably and consistently determine the compaction level being achieved.

Q. All backfill shall be compacted to a minimum of 95% of maximum dry unit weight as determined by Modified Proctor testing (ASTM Method D1557). The testing laboratory shall test soils in accordance with ASTM D2922 (nuclear method).

R. The Contractor shall be responsible for all costs for soil compaction testing.

3.11 BACKFILL FOR PIPE TRENCHES

A. General

1. The CLSM shall be placed in lifts as shown on the Design Drawings. CLSM shall be placed to ensure firm bedding and side support.
2. Refer to Specification Section 33 05 05 – Buried Pipe Installation for pipe backfill requirements.

3.12 GRADING

A. After the completion of all fill and backfill operations, the Contractor shall grade the site to meet the surrounding lines, grades and elevations, taking into account any subsequent site restoration and paving requirements.

B. Finish grading shall not be completed until all underground utilities, sewers, etc., have been installed.

- END OF SECTION -

SECTION 31 23 10

FILL MATERIALS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Specified
   1. The Contractor shall furnish fill materials from off-site sources as specified in this Section for the backfilling of excavations, restoration of surfaces, and other purposes required by the Contract Documents.
   2. Off-Site fill materials include:
      a. General fill.
      b. Controlled low strength material (CLSM).

B. Related Work Specified Elsewhere
   1. Section 31 23 00 – Excavation and Dewatering.

1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. American Association of State Highway and Transportation Officials (AASHTO)
   1. M 85, Standard Specification for Portland cement.
   2. M 157, Standard Specification for Ready-Mixed Concrete.
   3. M 194, Standard Specification for Chemical Admixtures for Concrete.
   4. M 295, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

B. ASTM International (ASTM)
   1. D4832, Standard Test Method for Preparation and Testing of CLSM Test Cylinders.
   2. D6103, Standard Test Method for Flow Consistency of CLSM.

C. New York Codes, Rules, and Regulations (NYCRR)
   1. Title 6, Environmental Conservation.
      a. Part 375, Environmental Remediation Programs.

D. New York State Department of Environmental Conservation (NYSDEC)
   1. DER-10, Technical Guidance for Site Investigation and Remediation.
      a. Appendix 5, Allowable Constituent Levels for Imported Fill or Soil.

1.3 SUBMITTALS

A. Names, addresses, and any existing state or local approvals for proposed off-site sources of general fill. If no prior state or local approval is available for the source, provide a brief history of the use of property which is the source of the fill.

B. Analytical reports for all fill materials selected for use.

C. Name and address of proposed CLSM Suppliers.

D. Description of proposed CLSM mixture design, including sources and proportions of CLSM materials.

E. Bills of lading for the transport and delivery of off-site fill materials.

F. Certified batch reports for CLSM created on site.

G. Description of form work to be used between CLSM pours, including formwork to be used at the outfall into the Bronx River.

H. CLSM consolidation plan including methods and manufacturer's cut sheets on equipment to be used

I. Provide fill material information to Design Engineer at least 3 weeks prior to bringing material on-site for use.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements
   1. Imported fill materials shall be free of foreign chemical contaminants and meet the restricted residential soil cleanup objectives (SCOs) set forth in 6 NYCRR Part 375 and included in Appendix 5 of DER-10.
   2. Imported fill material will require NYSDEC approval prior to delivery of backfill material to the site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery
   1. A bill of lading shall accompany each load of off-site fill material transported and delivered to the site.
      a. Bills of lading shall include, at a minimum, the following information:
         1) Source name and address.

2) Date.
3) Truck number.
4) Name of purchaser.
5) Name of shipping company.
6) Project name and location.
7) Transporter's name.
8) Load description (fill material type).
9) Gross and net weight of load.

b. Bills of lading shall be submitted to Oversight Engineer upon delivery.

2. CLSM shall be created on site or batched and delivered in accordance with AASTHO M 157.

a. CLSM may be transported in open haul units provided the material is placed within 60 minutes of the end of mixing. A rotating drum unit capable of two to six rotations per minute shall be used to transport CLSM that cannot be placed within 60 minutes after the end of mixing.

b. A batch report shall accompany each load of CLSM delivered to the site. Batch reports shall be prepared and certified by the production facility, and shall include, at a minimum, the following information:

1) Name of ready-mix batch plant.
2) Serial number of ticket.
3) Date.
4) Truck number.
5) Name of purchaser.
6) Project name and location.
7) Specific class or designation of the concrete in conformance with that employed in job specifications.
8) Amount of concrete (CSLM) in cubic yards.
9) Time loaded or of first mixing of cement and aggregates.
10) Water added by receiver of concrete (CSLM) and his initials.

c. Batch reports shall be submitted to the Oversight Engineer upon delivery.

d. The Contractor shall submit samples from every 500 cubic yards of CLSM created to a geotechnical laboratory. These samples will be tested for strength and flowability to confirm that the material meets the requirements put forth in Section 2.1 - C.2 of this specification. The Contractor shall submit the results of these tests to the Oversight Engineer within one day of test completion.

B. Storage and Protection

1. Fill materials shall be stored in locations approved by the Oversight Engineer so as not to endanger the Work, and so that easy access may be had at all times to all parts of the Work area.
2. Special precautions shall be taken to permit access at all times to fire hydrants, fire alarm boxes, driveways, and other points where access may involve the safety and welfare of the general public.
3. Temporary Stockpiles
    a. Stockpiles shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travelers or adjoining property holders.
    b. Stockpiles shall be securely covered at all times (during both working and non-working hours) with minimum 10-mil polyethylene liners when not in use. Liners shall be properly anchored to prevent uplift due to wind conditions and shall be installed to minimize the ponding of precipitation.
    c. Based on site conditions, the Oversight Engineer may elect to limit the maximum allowable stockpile size. Limitations to stockpile size shall not result in any additional cost to the Owner.
    d. Stockpiles shall be inspected daily (at a minimum) and any noted deficiencies shall be immediately corrected by the Contractor to the satisfaction of the Owner.

1.6 SCHEDULING

A. Anticipate and schedule Work, including excavation, backfilling, and restoration, to accommodate the sampling, analysis and review of fill materials by the Design Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General

1. Satisfactory Fills: Soil Classification Groups GW, GP, GM, SW, SP, and SM (as determined by ASTM D2487), or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen material, organic matter, and other deleterious materials.
2. Unsatisfactory Fills: Soil Classification Groups GC, SC, CL, ML, OL, CD, MH, OM, and PT (as determined by ASTM D2487), or a combination of these groups, unless otherwise required in the Contract Documents. Where soils of these groups are specifically required in the Contract Documents, the soils shall be considered satisfactory only for the specific

use for which they are specified. Unsatisfactory soils also include satisfactory soils not maintained within 2% of optimum moisture content at time of compaction.

B. General Fill

1. General fill shall consist of clean common earth fill, free of excessive moisture, organic material, coatings, sharp angular stones, unsatisfactory fills, and other deleterious materials.
2. General fill shall have the following gradation by weight:

Sieve	Percent Passing
3 inch	100
No. 200	10-30

C. CLSM

1. Self-leveling and self-compacting cementitious material manufactured with the materials specified below.
   a. 7.3 percent Cement by dry weight: Type V Portland Cement conforming to the chemical and physical requirements of those respective types as specified in AASHTO M 85.
   b. 80 percent Aggregates by dry weight: Aggregates shall be of calcium carbonate (limestone) chemical makeup and conform to the grain size specifications of AASHTO M 6 and M 80, as appropriate.
   c. 10.9 percent Fly Ash by dry weight: Fly ash shall conform to AASHTO M 295.
   d. Chemical Admixtures: Chemical admixtures shall be compatible with each other and conform to AASHTO M 194. Do not use calcium chloride or admixtures containing chloride ions. Use only admixtures that have been tested and approved in the mixture design.
   e. 0.9 percent Superplasticizer by dry weight: Superplastizer shall be of polycarboxylate ether base or approved equal.
   f. 0.6 percent potassium silicate by dry unit weight.
   g. Tributyl Phosphate, as needed, to prevent the CLSM from generating excessive air voids during mixing.
   h. Water: Clean, potable water free from oil, salts, acid, strong alkalis, vegetable matter, and other impurities that would have an adverse effect on the quality of the CLSM. The use of treated waste water is prohibited.

2. CLSM materials shall produce a cohesive and non-segregating mixture meeting the following properties:

a. Strength: Minimum unconfined compressive strength (UCS) of 30 psi at three days and maximum UCS of 180 psi at 28 days, as determined by ASTM D4832.
b. Flowability: Flow of 4 to 10 inches prior to placement, as determined by ASTM D6103.

2.2 SOURCE QUALITY CONTROL

A. The Contractor shall be responsible for all material testing.
1. Geotechnical Testing: Samples will be submitted by the Contractor to a geotechnical testing laboratory to determine the grain size distribution (ASTM D422) and moisture-density relationship (ASTM D698) of the materials from each source.
a. The grain size distribution of each material type will be compared to the appropriate material gradation specified in this Section.
b. Moisture-density relationships will be used (where appropriate) as a point of comparison for the in-place density tests to be performed by the Contractor's geotechnical testing laboratory on the compacted fill materials, as specified in Section 31 23 00.

2. Chemical Testing: Off-Site fill materials with greater than 10% by weight passing the No. 80 sieve, as determined by geotechnical testing specified above, shall be sampled by the Contractor in accordance with Subdivision 5.4(e) of DER-10. For each off-site fill source, the Contractor will collect a combination of discrete (grab) and composite samples based on the type of fill source (e.g., virgin mine/pit, former manufacturing site, etc.) and the characterization guidelines set forth in Table 5.4(e)10 of DER-10. Discrete and composite samples will be submitted by the Contractor to a chemical testing laboratory certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

B. Non-Conforming Materials: If the results of the testing show that a proposed fill material does not meet the applicable requirements of this Section, the Contractor shall identify an alternate source for that material. The alternate off-site fill source will be re-tested by the Contractor as specified above in Paragraph 2.02.A of this Section.

PART 3 – EXECUTION

3.1 CLSM FILLING

A. Segregation

1. CLSM shall be placed as close as possible to the location it shall occupy. The CLSM shall not be dumped into a central location and then be spread out to the location it shall occupy.

2. The maximum CLSM freefall placement shall be 5 feet. Tremie chute/pipes shall be used to place the CLSM.

3. CLSM shall be deposited in layers no more than 24 inches thick.

4. Successive layers of concrete shall be placed on top of preceding layers within one hour in order to prevent cold joints in the CLSM

5. Use a bonding agent on the previously place CLSM layer such as Anti-Hydro (Anti-Hydro International, 45 River Road, Flemington, NJ 08822) in accordance with the Manufactures recommendations or approved equal when adjacent layers of CLSM are not placed within 1 hour of each other. The bonding agent must be used on both horizontal and vertical cold joints.

B. Consolidation

1. Use a spud type vibrator with an effective vibrating radius of at least 18 inches in accordance with the manufacturer's recommendations to consolidated freshly poured CLSM. The CONTRACTOR shall use the following consolidation methods:

a. Vibrating is required to be done immediately as the CLSM is placed.

b. Vibrators shall be inserted and withdrawn vertically and shall not be dragged through the CLSM.

c. Vibrators shall be inserted and withdrawn within 5 seconds.

d. When CLSM is poured in layers, the head of the vibrator shall penetrate through the top layer and partially through the layer underneath.

e. The CONTRACTOR shall avoid contacting the form walls with the vibrator.

f. The CONTRACTOR shall have a replacement vibrator on site in case of equipment downtime.

- END OF SECTION-

SECTION 31 25 13

EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The Contractor shall furnish all labor, materials, tools and equipment, and perform all operations necessary for the construction and maintenance of temporary erosion and sedimentation control structures as shown on the Design Drawings or specified herein and as necessary to complete the Work.

1.2 SUBMITTALS

A. Submittals prior to construction:
   1. As a subsection of the Contractor's Operations Plan, the Contractor shall submit a written Erosion and Sedimentation Control Plan. The plan shall include proposed means and methods for controlling erosion and sedimentation during the Work. It also shall include specifications and means and methods for installation, maintenance, inspection and removal of reinforced silt fencing and straw wattles, in accordance with the Design Drawings or reasonably expected during execution of the Work.

B. Submittals during construction:
   1. Summary of erosion and sedimentation controls maintenance and repair activities provided in the Weekly Construction Report.

1.3 RELATED DOCUMENTS

A. Section 01 33 00 – Submittals

B. Section 01 50 00 – Temporary Facilities and Controls

C. New York Standards and Specifications for Erosion and Sediment Controls 2005

D. Stormwater Construction Site Inspection Form (Attached)

1. 4 PROJECT CONDITIONS

A. Sediment removal activities at the site shall be conducted in such a manner as to prevent accelerated erosion and resulting sedimentation.

B. The Contractor shall install temporary erosion and sedimentation control structures, as shown on the Design Drawings, and as necessary to prevent accelerated erosion

and sedimentation.

1.5 GENERAL METHODOLOGY

A. Erosion control structures installation shall consider all factors that contribute to erosion and sedimentation including, but not limited to, the following:
   1. topographic features of the site
   2. proposed alteration of the site
   3. amount of runoff from and run-on to the site
   4. staging of excavation activities
   5. temporary control measures and facilities required during excavation activities

PART 2 – PRODUCTS

2.1 DESCRIPTION

A. Temporary reinforced silt fence:
   1. Silt fence fabric shall be manufactured by Nicolon Mirafi, Inc., Amoco Fabrics, Inc., or equivalent.
   2. Steel or wood posts should be used for silt fence construction. The posts shall be a minimum of 36 inches long, and maximum post spacing for silt fencing shall be 8 feet. Pre-fabricated silt fence with attached wooden posts is acceptable, provided the fabric meets the requirements.
   3. Reinforcement shall consist of woven wire fence with a 14 gauge minimum size and a maximum mesh spacing of 6 inches.

B. Straw Wattles
   Straw wattles shall be North American Green WS-9 9” diameter wattles, or equivalent.

C. Sand Bags
   1. Sand bags shall be placed along excavation to prevent storm water from entering trench.
   2. Flow shall be diverted to a location acceptable to Oversight Engineer.

D. Contractor shall maintain a sufficient supply of all erosion and sediment products on site in case of emergency.

E. Contractor may substitute straw wattles for reinforced silt fence in areas not suitable for reinforced silt fencing (i.e., pavement or concrete surfaces) with approval from the Oversight Engineer.

F. Pipe Plug
   Pipe plug shall be Multi-Flex inflatable pipe plug or equivalent.

PART 3 – EXECUTION

3.1 CONSTRUCTION SEQUENCE – EROSION CONTROL MEASURES

A. Contractor shall identify erosion and sedimentation controls in the Erosion and Sedimentation Control Plan as part of the Contractor's Operations Plan.

B. Construction of temporary erosion control measures along the perimeter of the area under construction shall be completed prior to initiating any site work that may result in disturbance of soil and subsequently in areas of accelerated erosion and sedimentation.

C. All temporary erosion control measures shall be maintained throughout the construction activities in accordance with the New York Standards and Specifications for Erosion and Sediment Controls.

D. The Oversight Engineer may request that additional sediment and erosion controls be installed. The Contractor shall comply with the request and immediately install the required controls.

E. Perform daily inspection and repair of erosion and sedimentation controls as necessary. Document results of inspection and any repairs made on the Inspection Form provided in this Section, and included as a part of the Daily Construction Report.

F. Contractor shall dispose of all erosion and sedimentation controls following completion of the construction project at an approved and licensed disposal facility.

3.2 CONSTRUCTION METHODS

A. Erosion and sedimentation controls shall be installed at the site as specified on the Design Drawings.

B. The Contractor may use reinforced silt fence and straw wattles as needed and shall install consistent with New York Standards and Specifications for Erosion and Sediment Controls.

C. On slopes, the Contractor shall provide protection against washouts.

D. Erosion and sedimentation control measures shall be removed following completion of the Work upon approval or as directed by the Oversight Engineer.

E. The Contractor shall provide for the drainage of stormwater and any water applied or discharged on site in performance of the Work. Provide adequate drainage

facilities to prevent damage to the Work, the site and adjacent property consistent with erosion and sedimentation controls in accordance with the Design Drawings.

F. Accumulations of sediment adjacent to the erosion and sedimentation controls shall be periodically removed throughout the duration of construction activities. Sediment accumulations shall be removed when deposits reach approximately one-half of the height of erosion and sedimentation control.

G. Contractor shall install pipe plug(s) to prevent the release of sediment laden water from entering the Bronx River during construction activities, including pipe demolition.

- END OF SECTION -

Stormwater Construction Site Inspection Form	
General Information	
Project Name:	Location:
Date of Inspection:	Start/End Time:
Inspector's Name(s):	
Inspector's Title:	
Type of Inspection: Regular Pre-storm During storm event Post-storm event	
Weather Information	
Has there been a storm event since the last inspection? ☐Yes ☐No If yes, provide: Storm Start Date &Time: Storm Duration (hrs.): Approximate Amount of Precipitation (in):	
Weather at the time of this inspection? Clear Cloudy Rain Sleet Fog Snowing High Winds Other: Temperature:	
Have any discharges occurred since the last inspections? ☐Yes ☐No If yes, describe:	
Are there any discharges at the time of inspection? ☐Yes ☐No If yes, describe:	

Overall Site Issues

	BMP/activity	Implemented ?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	☐Yes ☐No	☐Yes ☐No	
2	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	☐Yes ☐No	☐Yes ☐No	
3	Is the construction exit preventing sediment from being tracked into the street?	☐Yes ☐No	☐Yes ☐No	
4	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐Yes ☐No	☐Yes ☐No	
5	(Other)	☐Yes ☐No	☐Yes ☐No	

SECTION 31 50 00

EXCAVATION SUPPORT

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Specified

1. The Contractor will provide, install, monitor, and maintain excavation support and protection systems in accordance with this Section and the Design Drawings. Excavation support and protection systems shall be capable of supporting excavation sidewalls, and resisting soil and hydrostatic pressures and superimposed and construction loads.
    a. Install and maintain excavation support and protection systems without damaging existing buildings, pavement, embankments, subsurface utilities, and other improvements adjacent to the excavation.
2. All labor, materials, equipment, surveys, and services necessary for or incidental to the following:
    a. Driving of the temporary steel sheet pile.
    b. Cutting of sheet pile when required.
    c. Monitoring of sheet piling
    d. Removing and cleaning temporary sheet piles.
3. In addition to identifying the technical requirements related to this component of the project, this specification also establishes the Owner's expectations regarding the steel sheeting installation, including the level of effort to be put forth by the Contractor concerning the installation activities.

    It is the Contractor's responsibility to thoroughly review the sheet pile wall design configuration and the available information concerning subsurface conditions, including the presence of cobbles, boulders, abandoned utilities or other potential obstructions or other conditions that may impede sheet pile installation. From this review, the Owner anticipates that the Contractor will review and understand the scope of the steel sheeting installation and the nature of the subsurface conditions that may be encountered during installation. The Owner also anticipates that the Contractor will provide the materials, equipment, and level and experience of labor necessary to install the steel sheeting consistent with the Design. Excavations will not extend below the limits depicted on the Design Drawings unless the Oversight Design Engineer (in consultation with the Owner) determines that such work is necessary and can be conducted in a safe manner.

4. Contractor is responsible for retaining a third-party tiltmeter monitoring subcontractor during construction.
5. Excavations will not extend below the limits depicted on the Design Drawings, unless approved by the Design Engineer.
6. Surface water or groundwater that enters the excavation will be handled/managed in accordance with the requirements of the Specifications

B. Related Work Specified Elsewhere
1. Section 01 71 23 – Survey Control
2. Section 31 23 00 – Excavation and Dewatering

1.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. Driving and Erecting: Installer shall be regularly engaged in the driving and erection of steel sheet piling.

B. Driving operators and foreman shall have a minimum of three years experience installing steel sheet piling.

1.3 SUBMITTALS

A. Certification: Provide documentation of agreement with licensed installer for provisions of quality control service for the sheet pile installation. Provide current welder certifications for personnel to perform welding. Only personnel with current certifications will be permitted to weld materials.

B. Resumes for key Contractor/subcontractor personnel, including project manager, on-site superintendent/foreman, on-site health and safety officer, and equipment operators. Also, number of years continuously engaged in sheet pile installation and summaries of representative Project experience.

C. Submit an Excavation Support Installation Plan as part of the Contractor's Operations Plan. It shall:

1. Describe the anticipated approach for installing the steel sheeting to the design configuration, assuming that no significant installation difficulties are encountered.
2. Include details of proposed methods to drive sheeting to the depths indicated on the Design Drawings and references to specific equipment makes/models and level of effort that will be used for standard steel sheet pile installation.
3. Identify certain contingency measures that the Contractor would employ in response to difficult subsurface conditions.
4. Describe quality control measures and equipment that will be used to ensure tight interlocking joints are maintained in order to minimize water

seepage through the sheet pile interlocks. Also include details of structural sheetpile interlock connectors, as required by the Design Drawings. This plan will also include the materials to be used during sealing activities and application techniques.

5. Include shop drawings for a sheet pile installation template (or demonstrate ability of equipment to maintain alignment during driving); showing all details and specifications of template components used to insure vertical and horizontal alignment is maintained during sheetpile installation.
6. Include mill test documentation for all structural steel to be used on the Project (sheet piling etc.). All mill documentation must be provided and checked with markings on the piling.
7. Include manufacturer's data that indicates the structural properties of the piling sections to be used, including I, S, moment capacity, thickness, and width/depth dimensions.
8. Include number of years continuously engaged in sheet pile installation and summaries of representative Project experience.
9. Include resumes for key Contractor/subcontractor personnel, including project manager, on-site superintendent/foreman, onsite health and safety officer, and equipment operators.
10. Include a list of equipment, including 'cut sheets', anticipated to be used for the installation of the sheet piling. For the sheet pile installation, the Contractor will include certification that each pile hammer delivered to the site is suitable for the anticipated conditions, including with regard to impact energy, static weight, and overhead clearance.
11. Tiltmeters: Details regarding tiltmeters (to be used to monitor sheetpile deflection during excavation activities). Details shall include manufacturer's specifications and installation/operating procedures with reference to specific equipment makes/models and level of effort that will be used for tiltmeter installation. Tiltmeter monitoring reports and progressive creep plots showing individual tiltmeter and cumulative movements will be submitted to the Design Engineer no later than the beginning of the subsequent work day during excavation and backfilling activities.
12. CLSM Separating Liner: Details regarding CLSM Separating Liner (used to prevent adhesion between the CLSM fill and the sheetpiles and minimize effort of extracting the sheet piles). Details shall include manufacturer's specifications and Contractors proposed method for installing separation liner prior to placing CLSM backfill. Liner may consist of polypropylene, particle board, or another Design Engineer approved material.

1.4 COORDINATION

A. Provide AZ 12-770 and AZ 36-700N sheet piles at least 10 days prior to beginning sheet installation activities.

B. Notify the Design Engineer at least 5 days prior to beginning excavation support and protection installation operations at any location. Notification shall not relieve the Contractor of its responsibilities for performing the work in accordance with the Design. Prior to notification, the Contractor shall ensure that all required submittals have been submitted to the Design Engineer and returned by the Design Engineer as "Reviewed" or "Reviewed and Noted".

1.5 PROJECT CONDITIONS

A. Employ a qualified land surveyor and establish exact elevations and northing and easting coordinates at fixed points (as shown on the Design Drawings) to act as control points. Clearly identify benchmarks and record existing elevations.

1. During installation and extraction of excavation support and protection systems, regularly resurvey benchmarks, and maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Oversight Engineer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
2. Prior to advancing sheet piles it may require demolition and removal in certain areas of undocumented below ground structures or pipes. Following discussions with the Oversight Engineer regarding the presence of such features, the Contractor shall conduct these activities to facilitate sheet pile installation and achieve the removal limits specified in the Design.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All materials shall be new (or in like new condition) and undamaged, and shall conform to pertinent AISC, ANSI, ASTM or other industry standards. Unless specified otherwise in other Sections, all materials in fabricated metal items shall conform to the following requirements:

B. Contractor supplied AZ 36-700N and AZ 12-770 steel sheet piling or approved alternate (AZ- sections without discontinuities that may affect ability to drive vertical/plumb and water tightness) as specified on the contract drawings.

C. All interlocking steel sheet piling shall meet or exceed one of the following:

1. ASTM A 328
2. ASTM A 572 - Grade 50
3. ASTM A 690

D. Splicing of sheet piling is not permitted.

E. Hammer:

1. Select the proposed pile driving equipment, including hammers and other required items, and submit complete descriptions of the proposed equipment in accordance with Part 1.03. Final approval of the proposed equipment is subject to the review by the Design Engineer. Changes in the selected pile driving equipment will not be allowed after the equipment has been approved except as specified and directed. No additional contract time will be allowed for Contractor proposed changes in the equipment.
   a. Pile Driving Hammers.
      1) Pile driving hammers will be of the vibratory, vibration-free (where vibrations may cause damage to existing structures). Impact driving will not be permitted unless approved by the Design Engineer.

F. Polyurethane Waterstop Sealant (Swellseal® WA - de neef® or approved equal)

1. Gunnable single component hydrophilic mastic.
2. Swells to approximately 200% of its original volume when in contact with water and resists hydrostatic pressures of up to 492 feet of water column.

G. CLSM Separating Liner:

1. Submit complete descriptions of the liner material in accordance with Part 1.03. Final approval of the proposed equipment is subject to the review by the Design Engineer.

H. Tiltmeter:

1. Tiltmeter will be 6160-1 MEMS Tiltmeters 6350-1-1 brackets or approved equal and the data logger will be, and 8003B-1 Dataloggers or approved equal.
2. The tiltmeter monitoring equipment must meet a 0.01 degree tolerance in order to know that any variances in movements are not due to the equipment tolerances, but rather they are due to actual movements of the temporary excavation support.

2.2 GENERAL REQUIREMENTS

A. General

Except as otherwise specifically noted in the Design, or specified herein, all materials and work for structural steel and miscellaneous metal work shall be in conformance with applicable provisions of the latest edition of the AISC *Steel* Construction Manual.

1. All members and parts, as delivered and erected, shall be free of winds, warps, local deformations, or unauthorized bends.

B. Field Erection

1. Structural steel and miscellaneous metal shall be stored on blocking so that no metal touches the ground and water cannot collect thereon. The

material shall be protected against bending under its own weight or superimposed loads.

2. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the Design Drawings. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, dewatering, and other hazards that could develop during excavation support and protection system operations.

B. Provide adequate clearance of support and protection systems within work areas to allow for proper installation/construction of required site features.

C. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or leaks, to ensure that excavation remains stable.

D. Damages to or destabilizing adjacent facilities, structures, pavement and/or earthen slope caused by activities associated with the installation or removal of the excavation support and protection systems shall be promptly repaired or replaced in-kind at the Contractor's expense.

E. Determine sheet piling layout and grade by survey.

F. Establish necessary lengths as determined on the Design Drawings.

G. Locate and protect all underground utilities, piping, structures.

H. Locate and protect all aboveground utilities, structures.

3.2 INSTALLATION OF STEEL SHEET PILES

A. The Contractor shall identify the presence of underground utilities or other obstructions. All underground utilities located within the pathway of the proposed steel sheet pile shall be removed, relocated, protected, or abandoned to facilitate installation of the steel sheet pile.

B. Pile driving shall only be permitted where utilities have been cleared and coordinated with the responsible utility prior to excavation near underground structures or utilities. All utilities identified within proposed excavation support

limits shall be excavated to expose and confirm. All existing pipes or structures to be exposed during excavation shall be adequately protected from damage before proceeding with the pile driving operation.

C. The Contractor shall remove any material that stops driving prior to continuation of driving, or develop an alternative methodology, reviewed by the Design Engineer, for completing sheet pile system installation.

D. The Contractor shall pre-trench the entire length of the sheet pile alignment to identify and clear obstructions or use other means necessary (e.g., spudding, hoe-ram, pre-drilling) to remove the obstructions in order to facilitate installation of the sheet piling.

E. Plumb steel sheet piling within four percent of pile length.

F. Sheet piling shall be constructed so as to keep the excavations free from earth or surface water runoff (into the excavation).

G. Sheet piling shall be constructed to meet all safety requirements.

H. Sheet piles will be installed and removed in phases according to the Excavation Support Installation Plan.

I. Set Up Sheet Piles

1. Drive piles with equipment suitable for the conditions encountered. The method and equipment selected shall deliver the necessary energy to drive the piling to the design depths as shown on the Design Drawings and minimize damage to each end of piling and adjacent interlocks. Suitable procedures must be employed to prevent damage to pile tops and joints.
2. Care should be maintained during pile pick-up to prevent damage due to excessive bending or twisting while positioning pile for driving. In the opinion of the Oversight Engineer, twisted or bent pile sections may be rejected from use.
3. Monitor, prevent, and correct any tendency of sheet piles to bend, twist or rotate, and to pull out of interlock. Care must be maintained throughout the installation process to ensure that piles do not declutch. The integrity of each pile and interlocked joint must be maintained during and after driving.
4. Piles damaged or driven outside the above tolerances shall be replaced. Any sheet pile ruptured in the interlock or otherwise damaged during driving shall be immediately pulled and replaced.
5. The Contractor shall take necessary precautions to ensure adjacent piles do not penetrate deeper during pile installation.
6. The Contractor shall pull any sheet pile that is known to have pulled out of interlock or is suspected of having tip or interlock damage and re-drive it.

7. Splicing of sheet piling is not permitted.

3.3 MONITORING

A. The Contractor shall supply at least four electronic angular tiltmeters to be installed, as per the manufacturer's recommendations, on the inside face (excavation side of sheet piling), 1" down from the top edge of sheet piling, as directed by the Oversight Engineer or Owner.

B. The Contractor will provide the Oversight Engineer with a daily record of tiltmeter readings relative to the baseline readings. Measurements will be performed daily during excavation and backfilling of excavation, with results submitted to the Oversight Engineer no later than the end of the subsequent work day.

C. For the tiltmeter measurements during sheet pile driving/extracting and excavation/backfilling, the Contractor will be allowed to continue work, but on an alert notice when there is 2.0 inches of movement seen in any of the tiltmeters.

D. Once 2.0 inches of movement is seen at a tiltmeter monitoring points (on the structure) in any direction (x, y or z) the tiltmeter measurements shall increase to twice daily (i.e. at noon and after excavation is finished for the day.). However, all work must stop once 2.9 inches of movement has been attained in any direction and the Oversight Engineer will be notified. Additional tiltmeter monitoring will continue on a repeatable basis for the location where the movement occurred, and any other optical monitoring points deemed necessary by the Oversight Engineer, for at least two days to determine if further movement occurs. If the movements cease, work can continue. If work continues, optical surveying will continue daily for the first two days of work at the monitoring point where the movement occurred, and any other monitoring points deemed necessary by the Oversight Engineer. If additional movement is detected at or above 2.9 inches, work shall stop and the Contractor shall backfill the excavation to reduce the deflection to less than 2.9 inches. When the deflection limits (i.e. 2.9 inches) have been reached, the Contractor must then propose a method to continue construction of the sheet pile wall to be reviewed by the Oversight Engineer and the Owner that prevents any further movement of the structure (e.g. sequential excavation and backfilling).

3.4 RECORDS

A. The Contractor shall provide accurate records of each sheet pile installed. Submitted records shall include the following information:

1. Pile identification number, along with location.
2. Date and time of driving.
3. Model of hammer and energy rating.
4. Elevation at top of pile.

5. Length of sheet pile in the ground when driving is complete.
6. Rate of penetration in feet/minute, as well as changes in rate of penetration and depth at which change occurred.
7. Detailed remarks concerning alignment, obstructions.

B. Mark identification number clearly visible on each sheet pile with a waterproof marking device, within two feet of the top, before driving is initiated.

C. Spray paint all sheet piles rejected from the work for any reason, at the time of rejection, with the letter "X" within three feet of both ends.

3.5 REJECTION

A. If excavation system components are rejected from the work because of deviation from location, plumbness requirement, excessive bending, twisting, pulling out of interlock, or other reasons, the Contractor shall take suitable corrective action at no additional cost to the Owner and such corrective action shall be reviewed by the Oversight Engineer. Suitable action includes extracting, furnishing, and driving of replacement sheet piles, so that all sheet piles installed meet the requirements of this Section and as indicated on the Design Drawings.

3.6 EXTRACTION AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging storm sewer piping, pipe bedding, structures, pavements, facilities, and utilities; repair the above items as needed.

3.7 PROVISIONS FOR REUSE OF STEEL SHEET PILING

A. Following extraction, the Contractor shall clean steel sheet piling and inspect for any damage that may have occurred while driving and/or extracting the piling. Decontamination shall be performed in the decontamination area constructed by the Contractor.

B. All piling must be inspected by the Oversight Engineer for reuse prior to redriving on following phase of sheet pile installation.

- END OF SECTION -

SECTION 32 12 00

FLEXIBLE PAVING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install flexible, hot-mix, hot-laid, asphalt concrete pavement.
   2. The Work includes:
      a. Preparation such as sawcutting, milling where shown or indicated, cleaning, and other preparation for installing flexible pavements.
      b. Providing asphalt concrete paving materials.
      c. Providing tack coat material.
      d. Providing pavement markings where shown or indicated.
      e. Providing quality controls and testing.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before flexible paving Work.

C. Related Sections:
   1. Section 31 05 19 - Geosynthetics.
   2. Section 31 23 00 - Excavation and Dewatering.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. AASHTO M320, Specification for Performance-Graded Asphalt Binder.
   2. AASHTO MP1a, Specification for Performance-Graded Asphalt Binder.
   3. AI MS-2, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
   4. ASTM C1371, Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
   5. ASTM C1549, Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
   6. ASTM D242/D242M, Specification for Mineral Filler For Bituminous Paving Mixtures.
   7. ASTM D692/D692M, Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.

8. ASTM D946/D946M, Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
9. ASTM D977, Specification for Emulsified Asphalt.
10. ASTM D1073, Specification for Fine Aggregate for Bituminous Paving Mixtures.
11. ASTM D1188, Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
12. ASTM D2726, Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
13. ASTM D2950, Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
14. ASTM D3549, Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
15. ASTM D6690, Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
16. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.
17. ASTM E408, Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
18. ASTM E1918, Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
19. ASTM E1980, Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
20. FS TT-P-115, Paint, Traffic, Highway, White and Yellow.
21. USGBC LEED-NC, Reference Guide, For New Construction and Major Renovation.

1.3 QUALITY ASSURANCE

A. Qualifications:
   1. Asphalt Concrete Production Facility:
      a. Production facility for asphalt concrete, tack coat materials, and other bitumastic materials shall be certified by the current City Department of Public Works Standards and Specifications.
   2. Contractor’s Testing Laboratory:
      a. Retain the services of independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section.
      b. Testing laboratory shall comply with ASTM E329.
      c. Testing laboratory shall be experienced in the types of testing required.
      d. Selection of testing laboratory is subject to Oversight Engineer's acceptance.

B. Regulatory Requirements:
   1. Reference Specifications and Details:

a. Comply with applicable requirements of the New York State Department of Transportation (NYSDOT) standard specifications and standard details.

2. Obtain required highway and street rights-of-way work permits.
3. Jurisdiction:
   a. Paved areas to be constructed are jurisdiction of Owner.

C. Quality Assurance Testing:
   1. Quality assurance testing is in addition to source quality control testing, when required, and field quality control testing required under Article 3.4 of this Section.
   2. Materials used in the Work may require testing and retesting, as directed by Oversight Engineer, during the Project. Allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be performed at Owner's expense, including retesting of rejected materials and installed Work, shall be performed at Contractor's expense.
   3. Contractor's Quality Assurance Testing Laboratory Scope:
      a. Use of testing laboratory shall not relieve Contractor of responsibility for providing materials and the Work in compliance with the Contract Documents.
      b. Quality assurance testing laboratory shall perform the following, unless evidence of material compliance with reference specifications indicated in Paragraph 1.3.B of this Section, is submitted to Oversight Engineer by Contractor and asphalt concrete production facility:
         1) Test in accordance with reference specifications indicated in Article 1.3 of this Section. In lieu of quality assurance testing, submit evidence and certification of material compliance with reference specifications. When evidence of conformance submitted is not acceptable to Oversight Engineer, perform quality assurance testing.
         2) Test in accordance with AI MS-2.
      c. To facilitate testing services, Contractor shall:
         1) Secure and deliver to testing laboratory and Oversight Engineer (when requested) representative Samples of materials that Contractor proposes to furnish and that are required to be tested.
         2) Furnish such labor as is necessary to obtain and handle Samples at the Site or at asphalt concrete production facility and other material sources.
         3) Advise testing laboratory and Oversight Engineer sufficiently in advance of operations to allow for completion of quality assurance tests and for the assignment of personnel.

1.4 SUBMITTALS

A. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section, providing complete data on materials, including location in the Work, source, material content and percentages, temperatures and all other pertinent data. Indicate proportion of bituminous material from reclaimed asphalt pavement.

B. Proposed gradation for each aggregate to be used in flexible paving. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.

C. In lieu of the information required under Paragraphs 1.4.A.1.a and 1.4.A.1.b, above, submit certificates of compliance with the reference specifications indicated in Article 1.3 of this Section, for each for the following:
   1. Each mix design required.
   2. Bituminous materials required.
   3. Aggregates to be used in flexible paving, from each material source and each required gradation.
   4. Density of uncompacted asphalt concrete material.
   5. Density of previously-compacted, previously-tested asphalt concrete material.
   6. Density and voids analysis for each asphalt concrete material test specimen.
   7. Evidence of asphalt concrete plant inspection and compliance with the reference specifications indicated in Article 1.3 of this Section.
   8. Proportion of reclaimed asphalt pavement in bituminous materials and aggregate.

D. Quality Assurance Test Data Submittals and Source Quality Control Submittals:
   1. Submit for quality assurance tests and source quality control tests required.

E. Delivery Tickets:
   1. Submit copy of delivery ticket for each load of asphalt concrete, tack coat materials, and other materials obtained from asphalt concrete production facility, signed by Contractor

F. Field Quality Control Submittals:
   1. Submit results of required field quality control testing.

G. Qualifications:
   1. Asphalt concrete production facility, when required by Design Engineer.
   2. Contractor's testing laboratory, when required by Design Engineer.

1.5 SITE CONDITIONS

A. Weather Limitations:
   1. Temperature:
      a. For base course and binder course paving lifts equal to or greater than two inches thickness, atmospheric temperature shall be 40 degrees F and rising.

b. For surface course paving or other pavement courses in lifts less than two inches thick, temperature of surface on which pavement is to be placed shall be 50 degrees F or greater.

2. Prohibitions:
   a. Do not place flexible paving materials when weather is foggy or during precipitation.
   b. Do not place flexible paving materials when the base on which the material will be placed contains moisture in excess of optimum.
   c. Place flexible paving materials only when Oversight Engineer concurs that weather conditions are suitable.

PART 2 – PRODUCTS

2.1 SYSTEM PERFORMANCE

A. System Description:
   1. Provide subbase course of the thickness shown or indicated, in accordance with Section 31 03 10 – Fill Materials.
   2. Flexible Pavement Courses:
      a. Provide the flexible pavement courses indicated below.
      b. All Pavement:
         1) Base Course.
         2) Binder Course.
         3) Surface Course (Wearing Course or Top Course).

2.2 ASPHALT CONCRETE MIXES

A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with reference specifications indicated in Article 1.2 of this Section:
   1. Base Course: NYSDOT Item No. 403.118902, Asphalt Concrete – Type 1 Base Course.
   2. Binder Course: NYSDOT Item No. 403.138902, Asphalt Concrete – Type 3 Binder Course.
   3. Surface Course (Wearing Course, Top Course): NYSDOT Item No. 403.198202, Asphalt Concrete – Type 7 F2 Top Course.

2.3 BITUMINOUS MATERIALS

A. Bituminous Materials for Asphalt Concrete:
   1. Bituminous materials for asphalt concrete shall comply with the reference specifications indicated in Article 1.3 of this Section, for the asphalt concrete mixes specified.

2. Bituminous Materials from Reclaimed Asphalt Pavement (RAP): When use of RAP in bituminous materials is acceptable, comply with requirements for RAP in Article 2.4 of this Section.

B. Tack Coat:
   1. Tack coat shall be emulsified asphalt.
   2. Provide NYSDOT Item. No. 407.0101, Tack Coat, in accordance with reference specifications indicated in Article 1.2 of this Section.

C. Crack Sealant:
   1. Provide sealant complying with ASTM D6690, hot-applied type.

2.4 AGGREGATES IN FLEXIBLE PAVEMENTS

A. Aggregates for Asphalt Concrete – General:
   1. Aggregate materials used in flexible pavement shall be in accordance with the reference specifications indicated in Article 1.2 of this Section, for the asphalt concrete mix designs indicated.

B. Reclaimed Asphalt Pavement (RAP):
   1. Processed material obtained by milling or full depth removal of existing asphalt concrete pavement may be used as aggregate in asphalt concrete base course and binder course.
   2. Maximum proportion of RAP in the asphalt concrete provided shall comply with requirements of the reference specifications indicated in Article 1.2 of this Section.
   3. When RAP is used, comply with Contract Documents requirements for the applicable asphalt concrete course mix design, bituminous materials, and aggregates.

2.5 PAVEMENT MARKING MATERIALS

A. Material:
   1. Pavement marking paint shall have chlorinated rubber base.
   2. Factory-mixed, quick-drying and non-bleeding, complying with FS TT-P-115, Type III.

B. Colors:
   1. Parking Areas: Yellow.
   2. No-Parking Areas: Yellow.
   3. Handicap Parking Spaces: Unless otherwise indicated with signs, provide handicap symbol on pavement with white paint on blue background.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine the subbase and base on which flexible paving will be installed. Notify Oversight Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

B. Do not place materials on subgrades, or subbase that is muddy or has water thereon.

3.2 PREPARATION

A. Preparation: Before starting installation of flexible paving, perform the following:
   1 Grade Control: Establish and maintain throughout flexible paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.
   2. Prepare subgrade and provide subbase for flexible pavement in accordance with Division 31. Before installing flexible pavement, obtain Oversight Engineer's concurrence that subgrade and subbase are suitable for installing flexible pavement.
   3. Provide appropriate maintenance and protection of traffic measures during placement of pavement.

B. Milling:
   1 Perform milling of existing pavement where shown or indicated.
   2. "Milling" consists of the milling, shaping, and removing portions of existing surfaces by cold milling process and subsequent cleaning.
   3. Milling Equipment:
      a. Milling machines shall be power-operated, self-propelled machines capable of removing the desired thickness of existing surfaces. Machines shall have sufficient power, traction, and stability to accurately maintain depth of cut and slope. Machines shall produce a finished profile and cross slope to within 1/4 inch of that required and shall produce uniform surface texture free of gouges and ridges greater than 3/8-inch deep.
      b. Machines shall be equipped with a means to control dust and other particulate matter created by the cutting action.
      c. Provide equipment that removes milled material as quickly as the rate of milling.
      d. Use vacuum trucks, street sweepers or power brooms to clean milled surfaces.

4. Milling Operations:
    a. Perform milling to so that, when final course of pavement is placed, required elevations and grades are provided. Where required, establish a taut reference string line to control line and grade of milling.
    b. Minimize the time between milling and placement of pavement over milled surface.
    c. Areas not accessible to the milling machine, such as around or adjacent to drainage structures, manholes, curbs, and transverse joints on structures, may be removed by a small milling machine, handwork or other method acceptable to Oversight Engineer.
    d. Remove milled material as soon as it is milled. Remove fines and other material prior to opening milled area to traffic. Control objectionable dust emissions. When traffic has been allowed into milled area or when more than 48 hours have elapsed since milling, clean the milled area again prior to applying tack coat.
    e. Maintain drainage to drainage inlets and other drainage structures in a manner acceptable to Oversight Engineer.
    f. Properly dispose of milled material at a location away from the Site.

C. Surface Preparation:
1. Repair surface defects in existing pavement to provide uniform surface to receive new pavement.
2. Provide crack sealant to completely fill cracks more than 1/16-inch wide in areas shown or indicated on the Drawings.
3. Clean existing surfaces over which asphalt concrete pavement will be installed, by removing from the surface foreign material, excess asphalt concrete, excess joint sealant, and crack filler, and other undesirable matter.
4. Provide tack coat as indicated in Article 3.3 of this Section.

3.3 INSTALLATION OF FLEXIBLE PAVING

A. General:
1. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.
2. Construct roadways to the lines, grades, and typical sections shown or indicated.

B. Installation of Asphalt Concrete:
1. Asphalt concrete mixture shall be transported to the site of paving and placed as soon as possible after mixing.
2. Placement of each asphalt concrete course shall be completed over the full width of the section under construction during each day's paving operations.
3. Spread and finish asphalt concrete courses by means of self-propelled mechanical spreading and finishing equipment. Compacted thickness of layers

placed shall not exceed 150 percent of specified thickness unless approved in writing by Design Engineer.

4. Compaction:
    a. Rollers:
        1) Use sufficient rolling equipment to satisfactorily compact and finish the quantity of asphalt concrete placed. There shall be not less than two rollers on the Project at all times. When acceptable to Oversight Engineer, one of the rollers may be a pneumatic-tire roller.
        2) During rolling operations, roller speed shall not exceed three miles per hour. When sufficient number of rollers is not available, reduce the quantity of asphalt concrete placed to accommodate the available rollers' speed.
        3) Required rollers shall be at the Site, in acceptable operating condition, prior to placing of asphalt concrete.
        4) Use of vibratory rollers in lieu of steel-wheeled rollers is acceptable, however when thickness of asphalt concrete is one-inch or less, rolling shall be in the static mode.
    b. Rolling of initially-placed asphalt concrete material, or breakdown rolling, shall begin as soon as the asphalt concrete mixture will bear the roller without undue displacement.
    c. Rolling shall be longitudinal, overlapping on successive trips by not less than one-half roller rear wheel width, and not more than three-quarters of roller rear wheel width. Alternate trips of the roller shall be of slightly different lengths.
    d. At all times, roller motion shall be slow enough to avoid displacing the asphalt concrete.
    e. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.
    f. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.
    g. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
    h. At each location not accessible to roller, thoroughly compact asphalt concrete with tampers and finish, where necessary, with a hot smoothing iron to provide uniform, smooth layer over the entire area so compacted.
5. Each compacted asphalt concrete course shall be within plus or minus 1/4-inch of the indicated thickness.
6. Placement of Adjacent Strips of New Asphalt Concrete:
    a. When more than one width of asphalt concrete material will be placed, a six-inch wide strip of asphalt concrete adjacent to the area on which the future material is to be placed shall not be rolled until such future material is placed.
    b. Do not leave the unrolled strip unrolled for more than two hours after placement, unless the six-inch unrolled strip is first heated with a joint heater.

c. After the first strip or width of asphalt concrete is compacted, place, finish, and compact the second width or strip as required for the first width, except that rolling shall be extended to include the six-inch strip of the first width not previously compacted.

C. Construction Joints:
1. Construction joints shall be made in such a manner as to ensure a neat junction, thorough compaction, and bond throughout.
2. Provide a transverse joint extending over the full width of the strip being laid and at right angles to its centerline at end of each workday and at other times when the placement of hot-mix asphalt concrete will be suspended for a period of time that will allow asphalt concrete mixture to chill.
3. Thoroughly compact by rolling the forward end of a freshly laid strip of asphalt concrete before the asphalt concrete mixture becomes chilled. When the Work is resumed, the end shall be cut vertically for the full depth of the layer.

D. Joining of Pavements:
1. When pavement is to join existing or previously-laid pavement, the existing or previously-laid pavement shall be neatly and carefully edged to allow for overlapping and feathering of the subsequent course of asphalt concrete material.
2. Where new pavement is to meet existing pavement, the existing pavement shall be sawcut and notched.
3. Where new pavement will meet existing asphalt pavement, remove existing pavement 12 inches onto undisturbed existing pavement course at edges where new pavement will meet existing pavement.
4. Tack Coat:
a. Provide tack coat material at the following locations:
1) At edges where new pavement will connect to existing or previously-installed pavement.
2) On surface of existing or previously-installed pavement course over which new pavement will be installed, prior to placement of the subsequent pavement course. Tack coat may be deleted when a succeeding layer of asphalt pavement is being applied over a freshly-placed asphalt pavement course that has been subjected to very little or no traffic, with approval of Oversight Engineer
3) Where new pavement will abut curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.
b. Tack Coat Installation: Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with reference specification indicated in Article 1.3 of this Section.

E. Curing:

1. Do not allow traffic onto pavement until directed by Oversight Engineer. Traffic will not be allowed on new asphalt concrete pavement until surface temperature is less than 140 degrees F.
2. Hold construction traffic on new pavement to a minimum as acceptable to Oversight Engineer.

F. Concrete Curbs: Provide extruded asphalt curbs of the height and profile indicated on the Drawings. Curbs shall be in accordance with Section 03 00 05 – Concrete.

G. Defective Pavement Work:
1. When directed by Oversight Engineer, remove and replace defective flexible paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

3.4 FIELD QUALITY CONTROL

A. Site Tests:
1. Responsibility:
a. Contractor's field quality control testing laboratory will:
1) Perform field density tests to verify that required compaction of asphalt materials has been obtained.
2) Test the proposed materials for compliance with the Contract Documents, as directed by Oversight Engineer.
3) Submit reports of all test results to Oversight Engineer and Contractor.
b. Authority Field Quality Control Testing Laboratory:
1) Technicians representing the testing laboratory will inspect materials at the Site and perform required testing. When the materials furnished or Work performed do not comply with the Contract Documents, field quality control testing laboratory technician shall direct the attention of Oversight Engineer and Contractor to such non-compliance.
2) Testing laboratory personnel shall not act as foreman or perform other duties for Contractor. The Work will be checked as it progresses, but failure to detect defective Work shall not in any way prevent the later rejection of such defective Work when defect is discovered. Failure to detect defective Work as it occurs does not obligate Oversight Engineer to final acceptance. Testing laboratory personnel are not authorized to revoke, alter, relax, enlarge, or release requirements of the Contract Documents, nor to approve or accept any portion of the Work.
2. Asphalt Concrete Mix Temperature: Measure temperature at time of placement, record, and submit to Oversight Engineer.
3. Surface Smoothness:
a. Test finished surface of each flexible paving course for smoothness, using a ten-foot straightedge applied parallel to and at right angles to centerline of paved areas.

b. Check surfaced areas at intervals as directed by Oversight Engineer.
c. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following:
1) Base Course: 3/8-inch vertical in ten feet horizontal.
2) Binder Course: 3/8-inch vertical in ten feet horizontal.
3) Surface Course (Wearing Course): 1/4-inch vertical in ten feet horizontal.
d. Elevation: Finished surface of pavement shall be within plus or minus 1/2-inch of elevations shown or indicated.

4. Density:
a. Test Method: ASTM D 2956 Nuclear Method; test one sample every 1,000 square yards of pavement. Test for each asphalt concrete course installed.
b. In addition, when directed by Oversight Engineer, compare density of in-place flexible paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.
c. Criteria for Acceptance: Density of in-place asphalt pavement material shall be not less than 90 percent of the recorded laboratory specimen or certificate density. Density shall be not greater than 98 percent.

5. Repair holes from test specimens in accordance with this Section's requirements for repairing defective Work.

3.5 ADJUSTING

A. Frames and Covers:
1. Set frames of drainage structures, manholes, valve boxes, and similar items to final grade. Adjust frames of existing structures and frames furnished under other Sections. Frames shall be substantially similar elevation to finished surface course of pavement.
2. Replace covers and gratings of existing structures immediately following adjusting associated frames. Install covers and gratings of structures provided under the Project as quickly as possible.
3. Where there is a delay between adjusting of frames and installation of surface course, provide temporary bituminous material around perimeter of each frame to smooth vehicle access over the frame. Maintain and repair temporary bituminous material as required until placement of surface course. Remove temporary bituminous material before installing surface course.

B. Pavement Adjustment:
1. Repair or replace in manner acceptable to Oversight Engineer areas of pavement that are observed to pond or collect water.

3.6 CLEANING

A. Cleaning: After completing the paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.7 PROTECTION

A. Protect finished pavement until pavement has become properly hardened and cool.

B. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

- END OF SECTION -

SECTION 33 05 05

BURIED PIPING INSTALLATION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to install and test all buried piping, fittings, and specials. The Work includes the following:
      a. All types and sizes of buried piping, except where buried piping installations are specified under other Sections or other contracts.
      b. Unless otherwise shown or specified, this Section includes all buried piping Work required, beginning at the outside face of structures or structure foundations, including piping beneath structures, and extending away from structures.
      c. Work on or affecting existing buried piping.
      d. Installation of all jointing and gasket materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, cathodic protection, and other Work required for a complete, buried piping installation.
      e. Supports, restraints, and thrust blocks.
      f. Field quality control, including testing.
      g. Cleaning.
      h. Incorporation of valves, meters, and special items shown or specified into piping systems in accordance with the Contract Documents and as required.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before buried piping Work.
   2. Coordinate with Section 40 05 33, High Density Polyethylene Pipe.

C. Related Sections:
   1. Section 31 23 10, Fill Materials.
   2. Section 03 00 05, Concrete.
   3. Section 40 05 33, High Density Polyethylene Pipe.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. ASTM D2321, Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications.
   2. ASTM D2774, Practice for Underground Installation of Thermoplastic Pressure Piping.
   3. ASTM D4174, Practice for Cleaning, Flushing and Purification of Petroleum Fluid Hydraulic Systems.
   4. ASTM F1417, Test Method for Installation Acceptance of Plastic Gravity Sewer Lines using Low-Pressure Air.
   5. ASTM F2164, Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.
   6. AWWA M55, PE Pipe - Design and Installation.
   7. ASCE 37, Design and Construction of Sanitary and Storm Sewers.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with requirements and recommendations of authorities having jurisdiction over the Work.
   2. Obtain required permits for Work in roads, right-of-way, railroads, and other areas of the Work.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Details of piping, specials, joints, harnessing and thrust blocks, and connections to piping, structures, equipment, and appurtenances.
   2. Product Data:
      a. Manufacturer’s literature and specifications, as applicable, for products specified in this Section.
   3. Testing Procedures:
      a. Proposed testing procedures, methods, apparatus, and sequencing.

B. Informational Submittals: Submit the following:
   1. Certificates:
      a. Certificate signed by manufacturer of each product certifying that product conforms to applicable referenced standards.
   2. Field Quality Control Submittals:
      a. Results of each specified field quality control test.

C. Closeout Submittals: Submit the following:
   1. Record Documentation:
      a. Maintain accurate and up-to-date construction documents showing

modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to buried piping Work. Submittal shall show actual location of all piping Work and appurtenances at same scale as the Drawings.

b. Show piping with elevations referenced to Project datum and dimensions from permanent structures. For each horizontal bend in piping, include dimensions to at least three permanent structures, when possible. For straight runs of piping provide offset dimensions as required to document piping location.

c. Include profile drawings with buried piping contract documents.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
   1. Deliver materials to the Site to ensure uninterrupted progress of the Work.
   2. Upon delivery, inspect pipe and appurtenances for cracking, gouging, chipping, denting, and other damage and immediately remove from Site and replace with acceptable material.

B. Storage:
   1. Store materials to allow convenient access for inspection and identification.
   2. Store material off ground using pallets, platforms, or other supports. Protect packaged materials from corrosion, deterioration, and deformation.

C. Handling:
   1. Handle pipe, fittings, specials, and accessories carefully in accordance with pipe manufacturer's recommendations. Do not drop or roll material off trucks. Do not drop, roll or skid piping.
   2. Avoid unnecessary handling of pipe.
   3. Keep pipe interiors free from dirt and foreign matter.
   4. Protect interior linings and exterior coatings of pipe and fittings from damage. Replace pipe and fittings with damaged lining regardless of cause of damage.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Piping materials are specified in the Buried Piping Schedule at end of this Section. Piping materials shall conform to Specifications for each type of pipe and piping appurtenances.

B. General:
   1. Pipe Markings:
      a. Factory-mark each length of pipe and each fitting with designation conforming to those on approved laying schedules.
      b. Manufacturer shall cast or paint on each length of pipe and each fitting pipe material, diameter, and pressure or thickness class.

2.2 BURIED PIPING IDENTIFICATION

A. Detectable Underground Warning Tape for Non-Metallic Pipelines:
   1. Tape shall be of inert, acid- and alkali-resistant, polyethylene, five mils thick, six inches wide, with aluminum backing, and have 15,000 psi tensile strength and 80 percent elongation capability. Tape shall be suitable for direct burial.
   2. Message shall read, "CAUTION [insert customized name of pipe service, i.e., "STORM SEWER", "SANITARY SEWER", "POTABLE WATER", or other appropriate service, as indicated in the Buried Pipe Schedule at the end of this Section] PIPE BURIED BELOW" with bold letters approximately two inches high. Messages shall be printed at maximum intervals of two feet.
   3. Manufacturer: Provide products of one of the following:
      a. Brady Corporation
      b. Seton Identification Products
      c. Marking Services, Inc.
      d. Or Design Engineer's Approved Equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Install piping as shown, specified, and as recommended by pipe and fittings manufacturer.
   2. In event of conflict between manufacturer's recommendations and the Contract Documents, request interpretation from Design Engineer before proceeding.
   3. Oversight Engineer will observe excavations and bedding prior to laying pipe by Contractor. Notify Oversight Engineer in advance of excavating, bedding, pipe laying, and backfilling operations.
   4. Minimum cover over buried piping shall be four feet, unless otherwise shown in Design Drawings or approved by Design Engineer.
   5. Excavation in excess of that required or shown, and that is not authorized by Oversight Engineer shall be filled at Contractor's expense with granular material furnished, placed, and compacted in accordance with Division 31.

6. Comply with NFPA 24 for "Outside Protection", where applicable to water piping systems used for fire protection.

B. Manufacturer's Installation Specialist:
   1. Provide services of competent installation specialist of pipe manufacturer when pipe installation commences for:
      a. HDPE pipe.
   2. Retain installation specialist at the Site for minimum of one day (eight hours per day at the Site) or until competency of pipe installation crew has been satisfactorily demonstrated.

C. Separation of Sewers and Potable Water Piping:
   1. Horizontal Separation:
      a. Where possible, existing and proposed potable water mains and service lines, and sanitary, combined, and storm sewers shall be separated horizontally by clear distance of at least ten feet.
      b. If local conditions preclude the specified clear horizontal separation, installation will be allowed if potable water main is in separate trench or on undistributed earth shelf on one side of sewer and with bottom of potable water main at least 18 inches above top of sewer.
      c. Exception:
         1) Where it is not possible to provide minimum horizontal separation described above, construct potable water main of cement-lined ductile iron pipe with restrained push-on joint or restrained mechanical joint pipe complying with public water supply design standards of authority having jurisdiction. Hydrostatically test water main and sewer as specified in this Section prior to backfilling. Hydrostatic test pressure at crossing shall be at least 150 psi.
   2. Vertical Separation:
      a. Provide minimum vertical distance of 18 inches between outside of potable water main and outside of sewer when sewer crosses over potable water main.
      b. Center a section of potable water main pipe at least 17.5 feet long over sewer so that sewer joints are equidistant from potable water main joints.
      c. Provide adequate structural support where potable water main crosses under sewer. At minimum, provide compacted select backfill for ten feet on each side of crossing.

D. Plugs:
   1. Temporarily plug installed pipe at end of each day of work or other interruption of pipe installation to prevent entry of animals, liquids, and persons into pipe, and entrance or insertion of deleterious materials into pipe.

2. Fully secure and block plugs, caps, and bulkheads installed for testing to withstand specified test pressure.
3. Where plugging is required for phasing of the Work or subsequent connection of piping, install watertight, permanent type plugs, caps, or bulkhead acceptable to Oversight Engineer.
4. Plug pipe, as appropriate, to prevent sediment laden water from entering the Bronx River.

E. Bedding Pipe: Bed pipe as specified and in accordance with details on the Drawings.
1. Trench excavation and backfill, and bedding materials shall conform to Division 31.
2. Excavate trenches below bottom of pipe by amount shown and indicated in the Contract Documents. Excavation shall be a minimum of two feet below the bottom of the pipe.
3. A minimum of two feet of Controlled Low Strength Material (CLSM) shall be placed below pipe as a mud mat in accordance with Section 31 23 10 - Fill Materials.
4. Do not lay pipe until Oversight Engineer approves bedding condition.
5. Do not install pipe bedding until all catch basins that connect to the length of the pipe have been installed.

F. Laying Pipe:
1. Conform to manufacturer's instructions and requirements of standards and manuals listed below, as applicable:
   a. HDPE Pipe: ASTM D2321, ASTM D2774, ANSI/AWWA C605, AWWA M23, AWWA M45, AWWA, M55.
2. Install pipe accurately to line and grade shown and indicated in the Contract Documents, unless otherwise approved by Design Engineer. Remove and reinstall pipes that are not installed correctly at no additional cost to Owner.
3. Slope piping uniformly between elevations shown.
4. Keep groundwater level in trench below bedding material. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete.
5. Deflections at joints shall not exceed 75 percent of amount allowed by pipe manufacturer.
6. Carefully examine pipe interior and completely remove all dirt, gravel, sand, debris, and other foreign material from pipe interior.
7. Pipe shall be laid on top of pre-formed blocks made from CLSM. Block dimensions shall be as needed to install pipe slope uniformly in trench.
8. Pipe shall be filled with water after installation to prevent floatation. Remove water after all applicable testing is approved, and backfill is placed or as approved by Oversight Engineer.

H. Jointing Pipe:
1. HDPE Pipe Joints:

a. Butt Fusion Welded Joints:

1) Install joints in accordance with manufacturer's instructions using hydraulic butt fusion machine or manual machine equipped with torque wrench. Equipment shall be able to achieve and maintain heating tool temperature range of 400 to 450 degrees F and an interface pressure of 60 to 90 psi.
2) Clean interior and exterior of pipe and fitting ends with clean, dry, lint-free cloth.
3) Align ends to be joined in the fusion machine without forcing ends into alignment. Adjust alignment as necessary and tighten clamps to prevent slippage.
4) Place facing tool between ends to be joined and face them to provide clean, smooth, parallel mating surface. If stops are present, face ends down to the stops. Remove all shavings after facing without touching ends.
5) Re-check alignment of ends and check for slippage against fusion pressure. There shall be no detectable gaps between ends. Align outside diameters.
6) Heating tool shall maintain pipe manufacture's recommended temperature range. Place the tool between ends to be joined. Move ends against heating tool to achieve full contact. Hold ends against heating tool without force until the following melt bead size is formed:

Pipe Diameter (inches)	Required Melt Bead Size (inches)
2 to 4	1/8 to 3/16
4 to 12	3/16 to 1/4
12 to 24	1/4 to 7/16
24 to 54	7/16 to 9/16
> 54	9/16 to 11/16

7) Upon forming proper melt bead size, quickly separate ends and remove heating tool. Quickly inspect melted ends and bring ends together applying joining force recommended by manufacturer, using 60 to 90 psi interfacial pressure to form double bead rolled over surface of pipe on both ends.
8) Hold joining force against ends until joint is cool to the touch. Cooling period shall be 30 to 90 seconds per inch of pipe diameter. Heavier wall thicknesses may require longer cooling times as recommended by pipe manufacturer.
9) Upon completing joint, inspect to verify double bead has been formed on both sides, uniformly rounded and consistent in size all around joint. Remove faulty joints and re-joint.

I. Backfilling:

1. Conform to applicable requirements of Division 31.

2. Place backfill after all testing has been completed and approved by Oversight Engineer.

J. Transitions from One Type of Pipe to Another:
1. Provide necessary adapters, specials, and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.

K. Closures:
1. Provide closure pieces shown or required to complete the Work.

3.2 TRACER TAPE INSTALLATION

A. Detectable Underground Warning Tape for Non-Metallic Pipelines:
1. Provide polyethylene tracer tape with aluminum backing for buried, non-metallic piping, which includes pipe that is HDPE.
2. Provide magnetic tracer tape 12 to 18 inches below finished grade, above and parallel to buried pipe.
3. For pipelines buried eight feet or greater below finished grade, provide second line of magnetic tracer tape 2.5 feet above crown of buried pipe, aligned along the pipe centerline.
4. Tape shall be spread flat with message side up before backfilling.

3.3 THRUST RESTRAINT

A. Provide thrust restraint on piping systems where shown or indicated in the Contract Documents.

B. Thrust restraint may be accomplished by using concrete thrust blocks. Thrust restraints shall be designed for axial thrust exerted by test pressure specified in the Buried Piping Schedule at the end of this Section.

C. Place concrete thrust blocks against undisturbed soil. Where undisturbed soil does not exist, or for projects where the Site consists of backfill material, thrust restraint shall be provided by restrained pipe joints.

D. Concrete Thrust Blocks:
1. Provide concrete thrust blocks on pressure piping at changes in alignment of 15 degrees or more, at tees, plugs and caps, and where shown or indicated in the Contract Documents. Construct thrust blocks of Class B concrete, conforming to Section 03 30 05 - Concrete.
2. Install thrust blocks against undisturbed soil. Place concrete so that pipe and fitting joints are accessible for repair.
3. Concrete thrust block size shall be as shown on the Design Drawings or as approved by Design Engineer.

3.4 WORK AFFECTING EXISTING PIPING

A. Location of Existing Underground Facilities:
   1. Locations of existing Underground Facilities shown on the Drawings should be considered approximate.
   2. Determine the true location of existing Underground Facilities to which connections are to be made, crossed, and that could be disturbed, and determine location of Underground Facilities that could be disturbed during excavation and backfilling operations, or that may be affected by the Work.

B. Taking Existing Pipelines and Underground Facilities Out of Service:
   1. Do not take pipelines or Underground Facilities out of service unless specifically approved by Owner's Representative.
   2. Notify Owner's Representative in writing prior to taking pipeline or Underground Facilities out of service. Shutdown notification shall be provided in advance of the shutdown.

C. Work on Existing Pipelines or Underground Facilities:
   1. Cut or tap piping or Underground Facilities as shown or required with machines specifically designed for cutting or tapping pipelines or Underground Facilities, as applicable.
   2. Install temporary plugs to prevent entry of mud, dirt, water, and debris into pipe.
   3. Provide necessary adapters, sleeves, fittings, pipe, and appurtenances required to complete the Work.

3.5 FIELD QUALITY CONTROL

A. General:
   1. Test all piping, except as exempted in the Buried Piping Schedule in this Section.
   2. When authorities having jurisdiction are to witness tests, notify Owner's Representative and authorities having jurisdiction in writing at least 48 hours in advance of testing.
   3. Conduct all tests in presence of Owner's Representative.
   4. Remove or protect pipeline-mounted devices that could be damaged by testing.
   5. Provide all apparatus and services required for testing, including:
      a. Test pumps, compressors, hoses, calibrated gages, meters, test containers, valves, fittings, and temporary pumping systems required to maintain Owner's operations.
      b. Temporary bulkheads, bracing, blocking, and thrust restraints.
   6. Provide air if an air test is required, power if pumping is required, and gases if gases are required.

7. Contractor shall provide means to convey fluid for hydrostatic testing into piping being tested. Contractor shall provide fluid for other types of testing required.
8. Repair observed leaks and repair pipe that fails to meet acceptance criteria. Retest after repair.
9. Unless otherwise specified, testing shall include existing piping systems that connect with new piping system. Test existing pipe to nearest valve. Piping not installed by Contractor and that fails the test shall be repaired upon authorization of Owner. Unless otherwise included in the Work, repair of existing piping or Underground Facilities will be paid as extra Work.

B. Test Schedule:
1. Refer to the Buried Piping Schedule in this Section for type of test required and required test pressure.
2. Unless otherwise specified, required test pressures are at lowest elevation of pipeline segment being tested.
3. For piping not listed in Buried Piping Schedule in this Section:
   a. Hydrostatically test pipe that will convey liquid at a pressure greater than five psig.
   b. Use exfiltration testing for other piping.
4. Test Pressure:
   a. Use test pressures listed in Buried Piping Schedule in this Section.
   b. If test pressure is not listed in Buried Piping Schedule, or if test is required for piping not listed in the Buried Piping Schedule, test pressure will be determined by Engineer based on maximum anticipated sustained operating pressure and methods described in applicable ANSI/AWWA manual or standard that applies to the piping system.

C. Hydrostatic Testing:
1. Preparation for Testing:
   a. For thermoplastic pipe and fiberglass pipe, follow procedures described in Section 7 of ANSI/AWWA Standard C605.
   b. For HDPE pipe, follow procedures described in ASTM F2164. Test duration, including time to pressurize, time for initial expansion, time at test pressure, and time to depressurize, shall not exceed eight hours. If re-testing of a test section or pipeline is required, at least eight hours shall elapse between tests.
   c. For steel pipe, follow procedures described in ANSI/AWWA Manual M11. Wetting period is not required for pipe that is not cement-lined.
   d. For other piping follow procedures described in ANSI/AWWA Manual M9, except that minimum wetting period required immediately prior to testing for asbestos cement pipe shall be 24 hours rather than the 48 hours prescribed for concrete pipe. Wetting period is not required for pipe that is not cement mortar-lined.

e. Prior to testing, ensure that adequate thrust protection is in place and joints are properly installed.

f. Piping for Hydraulic Fluid, Lube Oil, and Diesel Fuel: Hydrostatically test system using the fluid with which system will function permanently. Allowable leakage is zero. For fluid power systems, pipe manufacturer shall supervise installation and testing of system components, including field piping.

2. Test Procedure:

a. Fill pipeline slowly to minimize air entrapment and surge pressures. Fill rate shall not exceed one foot of pipe length per second in pipe being tested.

b. Expel air from pipe as required. Obtain approval of Design Engineer prior to tapping pipe for expelling air.

c. Examine exposed joints and valves, and make repairs to eliminate visible leakage.

d. After specified wetting period, add fluid as required to pressurize line to required test pressure. Maintain test pressure for a stabilization period of ten minutes before beginning test.

e. HDPE Pipe: After filling pipeline, gradually pressurize pipe to test pressure and maintain required test pressure for three hours for pipe to expand. During expansion, add fluid to maintain required test pressure. Begin timed test period after expansion period and other requirements are met.

f. Timed test period shall not begin until after pipe has been filled, exposed to required wetting period, air has been expelled, and pressure stabilized.

g. Timed Test Period: After stabilization period, maintain test pressure for at least two hours. During timed testing period, add fluid as required to maintain pressure within five psig of required test pressure. For HDPE pipe, after three hour expansion phase, reduce test pressure by ten psig and do not add liquid. Test pressure shall then remain steady for one hour, indicating no leakage.

h. Pump from test container to maintain test pressure. Measure volume of fluid pumped from test container and record on test report. Record pressure at test pump at 15 minute intervals for duration of test.

3. Allowable Leakage Rates: Leakage is defined as the quantity of fluid supplied to pipe segment being tested to maintain pressure within five psi of test pressure during timed test period. Allowable leakage rates for piping are:

a. No Leakage: Pipe with flanged, welded, fused, threaded, soldered, or brazed joints.

b. Rates based on formula or table in ANSI/AWWA Manual M41:

1) Metal and fiberglass pipe joined with rubber gaskets as sealing members, including the following joint types:

a) Bell and spigot and push-on joints.

b) Mechanical joints.

c) Bolted sleeve type couplings.
d) Grooved and shouldered couplings.

c. Rates based on make-up allowance in ANSI/AWWA Manual M9:
1) Prestressed concrete cylinder pipe and other types of concrete pipe joined with O-ring rubber gasket sealing members.

d. Rates based on formula or table in ANSI/AWWA C605:
1) Plastic pipe joined with O-ring gasket sealing members.

e. Rates based on formula or table in ANSI/AWWA C603:
1) Asbestos-cement pipe.

D. Exfiltration Testing:
1. Plug and bulkhead ends and lateral connections of pipe segment to be tested and admit fluid until the pipe is full. Admit fluid slowly to minimize air entrapment. Groundwater level shall be below the pipe during exfiltration test.
2. Before measuring leakage, allow fluid to wet pipe interior for the following period:
a. HDPE Pipe: Wetting period not required.
3. Maintain hydrostatic head during test to equal an elevation two feet above present and future maximum groundwater elevation at pipe segment tested. Design Engineer will determine test water surface elevation for each pipe segment.
4. Provide minimum hydrostatic head during test of two feet above crown of upstream end of pipe segment tested.
5. Add fluid from test container or from metered supply as required to maintain test water level within three inches of test head throughout the test.
6. Test duration shall be at least two hours.
7. Allowable Leakage Rates: Leakage is defined as the quantity of fluid that must be supplied to pipe segment tested to maintain hydrostatic head within three inches of test head during the test after pipe has been filled and exposed to required wetting period, plus quantity required to refill to original head at end of test. Allowable leakage rates for piping are:
a. No Leakage: Pipe with flanged, welded, fused, threaded, soldered, or brazed joints.

E. Vertical Deflection Test for HDPE Pipe:
1. Conduct vertical deflection test at least thirty days after backfill has been placed.
2. Manually pull pin-type vertical gauge mounted on sled through pipe. Gauge shall be manufactured by Quality Test Products, or equal. Set gauge so that sled will stop if vertical deflection of pipe exceeds five percent. Excavate and re-install piping that fails deflection test, and retest.
3. Contractor shall bypass storm sewer flows for duration of testing and inspection.

F. Examination of Welds:
   1. Visually examine all welds.
   2. If defect is detected, all welds shall be examined by liquid penetrant examination.
   3. At conclusion of liquid penetrant examination, remove penetrant test materials by flushing, washing, or wiping clean with applicable solvents.

3.6 CLEANING

A. Cleaning, General: Clean pipe systems as follows:
   1. Thoroughly clean all piping, including flushing with water, dry air, or inert gas as required, in manner approved by Design Engineer, prior to placing in service.
   2. For piping that requires disinfection, swab each section and joint individually before installation with five percent sodium hypochlorite solution.

B. Disinfection:
   1. Disinfect all potable and finished water piping including the fire line.

3.7 PERMITTING

A. Refer to the IRMWP section on Permitting for further details on how to obtain a permit for work on the site utilities.

B. Contractor shall coordinate utility permitting with Krasdale Foods Inc. building operations manager prior to contacting the New York City Buildings Department – Bronx Borough.

3.8 SCHEDULES

A. BURIED PIPING SCHEDULE

Service	Diameter (inch)	Material	Interior Lining	Exterior Coating	Pressure Class/ Thickness	Joint	Test
Storm Sewer	12, 20	High Density Polyethylene	N/A	N/A	DR 11	Butt Fusion Weld and Flanged	Exfiltration, Vertical Deflection Test, Examination of all Welds
Fire Line	12	Cast Iron	N/A	N/A	150	Mechanical Joint Cap at End and Install Thrust Block	Hydrostatic (150)

Note:
1. All tests shall be approved by Owner's Representative before backfill of trench except Vertical Deflection Testing.

MATERIALS AND PERFORMANCE – SECTION 330505

BURIED PIPING INSTALLATION

- END OF SECTION -

SECTION 33 05 14

HIGH DENSITY POLYETHYLENE (HDPE) CATCH BASINS

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Work Specified
   1. This section includes the material and quality requirements for HDPE catch basins.

B. Related Work Specified Elsewhere
   1. Section 03 00 05 - Concrete

1.2 QUALITY ASSURANCE

A. Applicable Codes, Standards, and Specifications
   1. American National Standards Institute (ANSI)
   2. American Society for Testing and Materials (ASTM)

B. Acceptable Manufacturers
   1. Performance Pipe, a division of Chevron Phillips Chemical Company, LLC.
   2. Or equal

1.3 SUBMITTALS

A. Shop drawings and design calculations for all HDPE catch basins shall be signed and stamped by a Professional Engineer licensed in New York State and submitted to the Design Engineer.

B. Submit shop drawings of catch basin structures showing dimensioning, inlets, and outlets showing compliance with the Contract Documents.

C. Submit a Manufacturer's Performance Affidavit for the equipment and appurtenances to be furnished under this section.
   1. The catch basin fabricator shall submit drawings showing the position of the inlets/outlets and the overall dimensions along with any other special features such as manways, ladders, etc.
   2. The fabricator shall submit data that the catch basins have been fabricated using the pipe wall thickness (SDR or RSC) and thickness of the bottom designed in accordance with ASTM F1759.

3. The catch basins shall be shop tested with water. The structure shall be determined to be leak free prior to shipping. The test results shall become part of the submittals. Identification indicating the job number, testing data, and when built and by whom shall be attached to the catch basin. The catch basin shall be filled with water and checked for leaks. The minimum duration of the test shall be 1 hour. Engineer may request to observe the test.

1.4 DESIGN REQUIREMENTS

A. Catch basins shall be watertight.

B. Catch basins shall be designed for H-20 loading.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

A. All polyethylene catch basins shall be produced by the same manufacturer.

B. Pipes and fittings for penetrations or for use within the structure shall be manufactured from virgin polyethylene resin (PE 3408) and shall have a minimum cell classification of 345464C in accordance with ASTM D3350. SDR for all penetrations shall be SDR 11.

C. Backup rings shall be epoxy coated ductile iron (installed on flanges by manufacturer), and bolting hardware shall be type 304 stainless steel. Gaskets shall be EPDM.

D. Supports shall be type 304 stainless steel and shall be attached by means of HDPE brackets extrusion-welded to the structure wall. All hardware shall be type 304 stainless steel.

E. Concrete top slab and concrete base shall be as shown on the Design Drawings and as specified in Section 03 00 05 - Concrete.

2.2 MATERIALS

A. The catch basin shall be made from high density polyethylene pipe and components meeting all the requirements of polyethylene pipe as specified in Section 40 05 33 - High Density Polyethylene Pipe.

B. All HDPE structures shall be hydrostatically shop tested to ensure a leak-free structure.

2.3 HDPE CATCH BASIN CONSTRUCTION

A. Catch basin ends shall be reinforced between the 2 walls to prevent flexing of the walls causing damage to extrusion welds.

B. The bottom shall be V-grooved and welded on both the top and the bottom of the sheet to make the required size. Bottom shall have reinforcing gussets extrusion welded at the corners. Bottom shall be extrusion welded to the catch basin barrel both inside and outside of the catch basin barrel. Additionally the bottom shall have a plate liner inside the catch basin barrel. Type 316 stainless steel hardware shall be used to attach the liner to the bottom plate and the liner shall be extrusion welded to the inside wall of the catch basin barrel.

C. Inlets and outlets shall be HDPE solid wall pipe with an SDR of 11. Inlets and outlets shall be flanged. The inlets and outlets shall be extrusion welded inside and outside the catch basin barrel. Reinforcing gussets shall be extrusion welded to the catch basin OD and to the inlets and outlets using shop controlled welding practice.

D. Top shall be built according to the requirement of the Design Drawings. Top shall be V-grooved and welded on both the top and the bottom of the sheet to make the required size. Top shall have reinforcing gussets extrusion welded inside the catch basin barrel. Top shall be extrusion welded to the catch basin barrel both inside and outside. Top shall have a 6-inch tall – 24 inch ID HDPE riser with a cast iron catch basin frame and grate above (min. 3” air gap). The Contractor shall place a reinforced concrete slab over the top as shown on the Design Drawings.

2.4 DRAINAGE FRAME AND GRATE

A. Drainage frame and gate shall be cast ductile iron, ASTM A536. Drainage frame and grate shall be heavy duty rated Model R-2565-G as manufactured by Neenah Foundry or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Handling of catch basins. HDPE catch basins shall be stored on a clean, level, dry ground to prevent undue scratching or gouging of the pipe. Handling of HDPE catch basins shall be done in such a manner that there is no damage to the catch basin or the inlets/outlets. Nylon slings are preferred to handle catch basins.

B. Flanged connections shall be used with an epoxy coated ductile iron backup bolt ring. Backup rings shall use a standard ANSI 150# bolt pattern. Hardware shall be type 304 stainless steel. Bolts shall be tightened in a star pattern to the recommended torque values. Bolts are to be tightened a second time after 24 hours to insure a positive seal.

C. Limit bending of pipe joined to catch basins.

D. HDPE catch basins shall be handled and stored in accordance with the manufacturer's recommendations. Installation should be consistent with manufacturer's printed installation procedures.

E. Manhole shall be carefully lowered into place. Integral lifting lugs should be used to prevent chain slipping.

F. The Contractor shall provide all necessary adapters and/or connection pieces required to connect the pipe penetrations with the external piping. The pieces shall form a completely connected operating system.

G. The pipe penetrations shall be factory installed with the necessary HDPE piping stubs as shown on the Design Drawings. No installations of field penetrations to the catch basin are permitted.

H. The Contractor shall provide the ¾" diameter stainless steel epoxy anchor bolts/dowels for the catch basin base as shown on the Design Drawings. Refer to Section 03 00 05 – Concrete for adhesive dowel requirements.

3.2 TESTING

A. Manhole structures shall be field tested by plugging the penetrations and filling with water. There shall be no appreciable drop in water level. Field test duration shall be two (2) hours. Testing shall be completed and approved by Oversight Engineer prior to backfill.

B. Examination of all welds:
   1. Oversight Engineer shall examine all welds.
   2. If defect is detected, all welds shall be examined by liquid penetrant examination. Flush, wash, or clean solvent after testing.

- END OF SECTION -

SECTION 40 05 33

HIGH DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope
   1. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish, test, and place in satisfactory service the High Density Polyethylene (HDPE) pipe and fittings as shown.
   2. The extent of HDPE pipe and fittings to be furnished is shown on the Design Drawings and presented in the piping schedules included in Section 33 05 05 - Buried Piping Installation.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with, or before, the HDPE pipe Work.

C. Related Sections:
   1. Section 31 23-10 – Fill Materials.
   2. Section 33 00 05 – Concrete.
   3. Section 33 05 05 – Buried Piping Installation.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:
   1. American Society for Testing and Materials (ASTM).
      a. ASTM D 638, Test Method for Tensile Properties of Plastics.
      b. ASTM D 696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics between - 30°C and 30°C with a Vitreous Silica Dilatometer.
      c. ASTM D 746, Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
      d. ASTM D 790, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
      e. ASTM D 1238, Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
      e. ASTM D 1248, Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
      f. ASTM D 1505, Test Method for Density of Plastics by the Density-Gradient Technique.

g. ASTM D 1525, Test Method for Vicat Softening Temperature of Plastics.
h. ASTM D 1598, Test Method for Time-to-Failure of Plastic Pipe under Constant Internal Pressure.
i. ASTM D 1693, Test Method for Environmental Stress-Cracking of Ethylene Plastics.
j. ASTM D 2240, Test Method for Rubber Property-Durometer Hardness.
k. ASTM D 2657, Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.
l. ASTM D 2837, Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.
m. ASTM D 3035, Specification for Polyethylene (PE) Plastic Pipe (DR-PR), Based on Controlled Outside Diameter.
n. ASTM D 3261, Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
o. ASTM D 3350, Specification for Polyethylene Plastics Pipe and Fittings Materials.
p. ASTM F 412, Terminology Relating to Plastic Piping Systems.
q. ASTM F 714, Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
r. ASTM F 1248, Test Method for Determination of Environmental Stress Crack Resistance (ESCR) of Polyethylene Pipe.

2. American Water Works Association, (AWWA).
   a. AWWA C906, Polyethylene (PE) Pressure Pipe and Fittings, 4-inch through 63-inch, for Water Distribution.
3. National Science Foundation, (NSF).
   a. NSF 14, Plastics Piping Components and Related Materials.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Manufacturer shall have a minimum of five years experience producing substantially similar type materials and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.
   2. HDPE pipe and fittings shall be the product of a single manufacturer.
   3. The HDPE pipe and fittings manufacturer shall have an established Quality Assurance Program responsible for inspecting incoming and outgoing materials.
   4. The HDPE pipe and fittings manufacturer shall have an established Quality Assurance program responsible for assuring the long-term performance of materials and products.
   5. The HDPE pipe and fitting manufacturer shall maintain permanent Quality Assurance/Quality Control (QA/QC) records.

B. Installer's Qualifications:
   1. Engage a single installer regularly engaged in HDPE piping installation and with experience in the installation of the types of materials required; and who agrees to employ only tradesmen with specific skill and experience in this type of Work. Submit name and qualifications to Design Engineer.
   2. Engage a single installer for the entire HDPE piping system with undivided responsibility for performance and other requirements.

C. Component Supply and Compatibility:
   1. The HDPE pipe and fittings manufacturer shall review and approve or prepare all Shop Drawings and other submittals for all components furnished under this Section.
   2. All components shall be specifically constructed for the specified service conditions and shall be integrated into the overall assembly by the HDPE pipe and fittings manufacturer.

D. Acceptable Manufacturers
   1. Performance Pipe, a division of Chevron Phillips Chemical Company, LLC.
   2. Or equal

1.4 SUBMITTALS

A. Submit these with Shop Drawings required under Section 33 05 05, Buried Piping Installation.

B. Action Submittals: Submit the following:
   1. Shop Drawings:
      a. Details of piping system including location of supports, restraints, fittings, anchors, vents, low-point drains, termination assemblies and all accessories necessary for piping system.
      b. Pipe laying schedules.
   2. Product Data:
      a. Details of construction, fabrication, and pipe materials.
      b. Detailed procedures to be used in joining and installing piping system, including manufacturer's recommendations.
   3. Testing Plans, Procedures, and Testing Limitations:
      a. Pipe testing procedures.

C. Informational Submittals:
   1. Certificates:
      a. Materials Certificates of Conformance: Submit certificates of conformance with Referenced Standards as required in Article 2.4, below.
      b. Upon shipment, Contractor shall furnish the HDPE pipe manufacturer's Quality Assurance/Quality Control (QA/QC) certifications to verify that the materials supplied for the Project are in accordance with the

requirements of this Section and a manufacturer's warranty covering materials and workmanship of the HDPE piping.

2. Suppliers Instructions:
   a. Detailed procedures to be used in joining and installing piping system, including manufacturer's recommendations.
3. Qualifications Statements:
   a. Installer's qualifications.

1.5 DELIVERY, STORAGE AND HANDLING

A. Refer to Section 33 05 05 - Buried Piping Installation.

PART 2 – PRODUCTS

2.1 SYSTEM PERFORMANCE

A. HDPE piping system shall be specifically designed, constructed, and installed for the service intended and shall comply with the following service conditions.

B. Design Criteria:

Location:	Storm Sewer	
Nominal Pipe Size (in.):	12	20
Pressure Rating, (psi):	200	200
Min. Wall Thickness (in.):	1.159	1.818
Dimension Ratio:	DR 11	DR 11

2.2 PHYSICAL PROPERTIES

A. Materials used for the manufacture of polyethylene pipe and fittings shall meet the following physical property requirements:

Property	Unit	Test Procedure	Value
Material Designation	-	PPI/ASTM	-
PPI Material Listing	-	PPI TR-4	PE 3408
Material Classification	-	ASTM D 1248	III C 5 P34
Cell Classification	-	ASTM D 3350	345434C or 355434C
Density	g/cm3	ASTM D 1505	>0.941
Melt Index (E)	g/10 min	ASTM D 1238	<0.15
Flexural Modulus	psi	ASTM D 790	>110,000
Tensile Strength	psi	ASTM D 638	<160,000
ESCR (C)	hours	ASTM D 1693	3,000 to 3,500
HDB	psi	ASTM D 2837	1,600 @ 23°C
UV Stabilizer (C)	percent carbon		
	Black	ASTM D 1603	2 to 3
Elastic Modulus	psi	ASTM D 638	110,000
Brittleness Temperature F		ASTM D 746	<-180

Property	Unit	Test Procedure	Value
Vicat Softening Temp F		ASTM D 1525	255
Thermal Expansion in/in/ F		ASTM D 696	8 x 10E-5
Hardness	Shore D	ASTM D 2240	64
Molecular Weight Category	-	-	Extra-High

B. There shall be no evidence of splitting, cracking or breaking when the pipe is tested in accordance with Article 2.4, below.

C. Ring Stiffness Constant (RSC) values for the pipe can be directly related to the pipe's class designation. (Nominal RSC of Class 40 pipe = 40, etc.). The minimum RSC is 90 percent of the nominal.

D. The HDPE pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.

E. Clean rework or recycled material generated by the manufacturer's own production may be used as long as the pipe or fittings produced meet all the requirements of this Section.

2.3 PIPE AND FITTINGS

A. Dimensions:

1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with AWWA C901 and AWWA C906. Standard laying lengths shall be 50 feet ± 2-inches.
2. Fitting Dimensions: Fittings such as couplings, wyes, tees, adapters, etc. for use in laying pipe shall have standard dimensions that conform to ASTM D 3261.

B. Pipe and fittings shall be produced from identical materials, meeting the requirements of this Section, by the same manufacturer. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified by Design Engineer. Whether molded or fabricated, fittings shall be fully pressure rated to at least the same service pressure rating as the pipe to which joining is intended.

D. Molded fittings shall meet the requirements of ASTM D 3261 and this Section. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code from which the location and date of manufacture can be determined. The manufacturer shall provide an explanation of the production codes used.

E. Flanged fittings shall be IPS molded flange adapters with ductile iron backer rings. Flange adapter shall match DR of connecting pipe. Hardware shall be type 304 stainless steel.

F. Marking:
1. Each standard and random length of pipe and fitting in compliance with this standard shall be clearly marked with the following information.
    a. ASTM or AWWA Standard Designation.
    b. Pipe Size.
    c. Class and Profile Number.
    d. Production Code.
    e. Standard Dimension Ratio (SDR).

2.4 SOURCE QUALITY CONTROL

A. At a minimum, incoming polyethylene materials shall be inspected for density in accordance with ASTM D 1505 and melt flow rate in accordance with ASTM D 1238. All incoming polyethylene materials shall be certified by the supplier. Certification shall be verified by Contractor and Oversight Engineer. Incoming materials shall be approved by Manufacturer's Quality Assurance Program before processing into finished goods.

B. Representative samples of polyethylene materials shall be tested against the physical property requirements required herein. Each extrusion line and molding machine shall be qualified to produce pressure rated products by taking representative production samples and performing sustained pressure tests in accordance with ASTM D 1598.

C. Quality Assurance test for representative pipe and fitting samples shall include:

Test	Standard	Pipe	Fittings
Sustained pressure at 176°F/725 psi hoop stress: (f_O>100 h)	ASTM D 1598	Yes	Yes
Sustained pressure at 73°F/1,600 psi hoop stress: (f_O>1000 h)	ASTM D 1598	Yes	Yes

D. Inspection Requirements:

1. Notification: The HDPE pipe and fitting manufacturer shall notify the Contractor in advance of the date, time, and place of testing of the pipe in order that Contractor may be represented at the test.
2. Access: The Oversight Engineer shall have free access to the Inspection area of the manufacturer's plant. The manufacturer shall make available to the Oversight Engineer, without charge, all reasonable facilities for determining whether the pipe meets the requirements of this Section.
3. Certification: As the basis of the acceptance of the material, the manufacturer will furnish a certificate of conformance of these Specifications upon request. When prior agreement is being made in writing between Design Engineer, Contractor and the manufacturer, the manufacturer will furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports.
4. All outgoing materials shall be inspected for diameter, wall thickness, length, straightness, out-of-roundness, concentricity, toe-in, inside and outside surface finish, markings, and end cut. Manufacturer's Quality Control Program shall perform tests of density; melt flow rate, carbon content, and carbon dispersion. In addition, samples of the pipe provided shall be tested for hoop tensile strength and ductility by either quick burst in accordance with ASTM D 1599 or ring tensile strength in accordance with ASTM D 2290. Molded fittings shall be subject to x-ray inspection for voids, and tests for knit line strength. All fabricated fittings shall be inspected for fusion quality and alignment.

E. Physical Test Requirements:

1. Sampling: The selection of the sample of pipe shall be as agreed upon by the Oversight Engineer, Contractor and the manufacturer. In case of no prior agreement, any sample selected by the manufacturer shall be deemed adequate.
2. Sample size for flattening test will be one sample for each size and class of pipe

for the Project.

3. Conditioning: Conditioning of samples prior to and during test shall be as agreed upon by the Oversight Engineer, Contractor and manufacturer. In case of no prior agreement, the conditioning procedure used by the manufacturer shall be deemed adequate.

F. Test Methods:

1. Flattening: Three specimens of pipe, a minimum of 12-inches long, shall be flattened between parallel plates in a suitable press until the distance between the plates is 40 percent of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within two to five minutes. Remove the load, and examine the specimens for splitting cracking or breaking.
2. Pipe Ring Stiffness Constant: The pipe ring stiffness constant shall be determined utilizing procedures similar to those outlined in ASTM D 2412. The stiffness of HDPE pipe is defined in terms of the load, applied between parallel plates, which causes one percent reduction of pipe diameter. Test specimens shall be a minimum of two pipe diameters or four feet in length, whichever is less.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Pipe may be rejected for failure to conform to these Specifications or following:

1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2-inches in length at either end of pipe which could be cut off and discarded. Pipes within one shipment shall be rejected if defects exist in more than five percent of shipment or delivery.
2. Cracks sufficient to impair strength, durability or serviceability of pipe.
3. Defects indicating improper proportioning, mixing, and molding.
4. Damaged ends, where such damage prevents making satisfactory joint.
5. Gouges or scrapes exceeding ten percent of the specified wall thickness.

B. Acceptance of fittings, stubs or other specifically fabricated pipe sections shall be based on visual inspection at Site and documentation of conformance to these Specifications.

C. Contractor to provide as-built of pipe end point and angle point coordinates and elevations prior to backfilling trench.

3.2 INSTALLATION

A. Refer to Section 33 05 05, Buried Piping Installation.

B. Butt Fusion Welded Joints:

1. HDPE pipe and fittings joints shall be heat fused by a qualified technician; trained by the manufacturer's representative in accordance with the manufacturer's recommended fusion procedures. Training must have occurred within the previous 12 months, or submittals verifying experience within the previous 12 months for all technicians performing heat fusion on polyethylene pipe and fittings.
2. Weld in accordance with manufacturer's recommendation for butt fusion methods. Personnel operating fusion equipment shall be certified by the HDPE pipe manufacturer.
3. The first butt fusion weld of each day's production welding and for each separate operator shall be tested by bent strap test method. No production welds shall be performed until successful completion of bent strap test. Refer to Part 3.4 of this section for testing requirements.
4. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by HDPE pipe manufacturer including, but not limited to, temperature requirements, alignment, and fusion pressures. The equipment used for the heat fusion joints shall be capable of recording the heating and fusion pressures used to join the HDPE pipe, recording heater temperature, and storing this information for future retrieval (data logger). Each field fusion shall be recorded by such equipment and this information shall be made compiled into daily log reports. Log reports shall be submitted to Contractor and Oversight Engineer daily. Reports shall also include the results of the bent strap tests.
5. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations.
6. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade. Shop Drawings shall address locations and deflections of required fittings to prevent installation that exceeds a greater degree of bending than the manufacturer's recommended minimum bending radius for each size and class of HDPE pipe.
7. Do not subject pipe to strains that will overstress or buckle piping or impose excessive stress on joints.
8. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of size to facilitate saddle fusion within trench.
9. Before butt fusing pipe, inspect each length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe.
10. Cover open ends of fused pipe at the end of each day's Work. Cap to prevent entry by animals or debris.

C. Flange Jointing:

1. Use on flanged pipe connection sections.
2. Connect slip-on epoxy coated ductile iron flanges with type 304 stainless steel hardware.

3. Butt fuse fabricated flange adapters to pipe.
4. Observe following precautions in connection of flange joints.
    a. Align flanges or flange/valve connections to provide tight seal. Require nitrile-butadiene gaskets if needed to achieve seal. Integral flange adapters and gaskets are required for flange/valve connections.
    b. Place U.S. Standard round washers as may be required on some flanges in accordance with manufacturer's recommendations. Bolts shall be lubricated in accordance with manufacturer's recommendations.
    c. Tighten flange bolts in sequence and accordance with manufacturer's recommendations. CAUTION: Do not over-torque bolts.
5. Pull bolt down by degrees to uniform torque in accordance with manufacturer's recommendation.
6. Install electrofusion couplers, where used, in accordance with manufacturer's specifications.

D. Pipe Placement:
1. Grade control equipment shall be of type to accurately maintain design grades and slopes during installation of pipe.
2. Dewatering: Remove standing water in trench before pipe installation.
3. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.
4. Maximum lengths of fused pipe to be handled as one section shall be placed according to manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion, but shall not exceed 400 feet.
5. Cap pipe sections longer than single joining (usually 50 feet) on both ends during placement, except during fusing operations.
6. Notify Oversight Engineer prior to installing pipe into trench and allow time for Oversight Engineer inspection.
    a. Correct irregularities found during inspection.
7. Complete tie-ins within trench whenever possible to prevent overstressed connections.
8. Allow pipe sufficient time to adjust to trench temperature prior to testing, segment tie-ins or backfilling activity.
9. Install reducers adjacent to laterals and tees.
10. To reduce branch saddle stress, install saddles at slope equal to and continuous with lateral piping.
11. Pipe shall be snaked in trench to allow a minimum of 12-inches/100 feet for thermal contraction and expansion.
12. Allow extra length at future connection points to be cut to fit after backfill and prior to tie-in.

3.3 LEAKAGE TESTS

A. Refer to Section 33 05 05 - Buried Piping Installation.

3.4 BENT STRAP TESTING

A. Prepare a sample joint. Sample lengths should be at least 6” or 15 times the minimum wall thickness.

B. Observe the fusion process and verify the recommended procedure for butt fusion is being followed.

C. Visually inspect the sample joint for quality.

D. Allow the joint to cool completely (minimum of one hour).

E. The sample should be cut lengthwise into at least three longitudinal straps with a minimum of 1” or 1.5 times the wall thickness in width.

F. Visually inspect the cut joint for any indications of voids, gaps, misalignment or surfaces that have not been properly bonded.

G. Bend each sample at the weld with the inside of the pipe facing out until the ends touch.

H. The inside bend radius should be less than the minimum wall thickness of the pipe. In order to successfully complete the bend back, a vise may be needed. For thick wall pipe, a hydraulic assist may be required.

I. The sample must be free of cracks and separations within the weld location. If failure does occur at the weld in any of the samples, then the fusion procedure should be reviewed and corrected. After correction, another sample weld should be made per the new procedure and re-tested.

- END OF SECTION -

ARCADIS

Appendix D

Stormwater Pollution Prevention Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Consolidated Edison Company of New York, Inc.

Stormwater Pollution Prevention Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

September 2014

Stormwater Pollution Prevention Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Manufactured Gas Plant
Bronx, New York

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.446.8053

Our Ref.:
B0043027.0009

Date:
September 2014

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

ARCADIS

Table of Contents

Acronyms and Abbreviations

BMP	Best Management Practice
CLSM	controlled low-strength material
Con Edison	Consolidated Edison Company of New York, Inc.
GP-0-10-001	General Permit for Stormwater Discharges from Construction Activity
Krasdale property	Krasdale Foods, Inc. portion of the Hunts Point former Manufactured Gas Plant
MGP	manufactured gas plant
NOI	Notice of Intent
NYSDEC	New York State Department of Environmental Conservation
OUs	operable units
IRMWP	Interim Remedial Measure Work Plan
SPDES	State Pollutant Discharge Elimination System
SWPPP	Stormwater Pollution Prevention Plan

1. Introduction and Purpose

This *Stormwater Pollution Prevention Plan* (SWPPP) presents the erosion and sedimentation control measures to be implemented during replacement of the storm sewer on the Krasdale Foods, Inc. portion (Krasdale property) of the Hunts Point former Manufactured Gas Plant (MGP) ("the site") as detailed in the Interim Remedial Measure Work Plan (IRMWP) which this document is appended to. The storm sewer replacement is being conducted to reduce the potential for discharge of MGP-impacted water from the storm sewer to the Bronx River. The SWPPP objectives for the site are to minimize: (1) the potential for erosion of soil/sediment; (2) the accumulation of sediment-laden stormwater within the work area and conveyance of sediment-laden surface runoff to downgradient off-site areas (e.g., Bronx River); (3) the potential for tracking of sediments onto off-site areas; (4) potential pollutant sources; (5) the potential for a release of vehicle and equipment fluids (e.g., gasoline, diesel, grease, oil, coolant); and (6) the potential post-construction impacts to stormwater runoff from the construction.

1.1 Site Description

1.1.1 Location

The Krasdale property is located on the northeastern portion of the Hunts Point former MGP in the Borough of Bronx, New York City, Bronx County, New York (Figure 1 of the IRMWP). The Krasdale leasehold property is an approximately 11-acre tract of land on the eastern portion of Hunts Point, a peninsula at the confluence of the Bronx and East Rivers. The Krasdale property is bounded by Food Center Drive to the west, Parcel D to the north, Parcel C to the south, and the Bronx River to the east, and includes Parcel F. As indicated below in subsection 1.1.2, the referred-to parcels were designated as part of the larger planned investigation and remediation of the Hunt's Point former MGP.

1.1.2 Site History

The Hunts Point former MGP was operated by the Consolidated Edison Company of New York, Inc. (Con Edison) from late 1926 to 1962. Demolition of the former MGP was completed in early 1968. That same year, Con Edison sold the majority of the 205-acre site to the City of New York for use as a wholesale cooperative food market. Portions of the former MGP have been divided into parcels (A through F) for purposes of investigation and remediation (to be completed by others).

For the remaining portions of the Hunts Point former MGP, for which Con Edison is responsible for the investigation and remediation (Voluntary Cleanup Program Site No. V00554), the New York State Department of Environmental Conservation (NYSDEC) divided these areas into the following operable units (OUs):

- OU-1 – Krasdale Property
- OU-1A – Discharge Pipe (located on the Krasdale property)
- OU-3 – Halleck Street
- OU-4 – National Foods Parcel
- OU-5 – Sediments
- OU-6 – Marine Transfer Station

OU-1A (Discharge Pipe) is the focus of this SWPPP.

1.1.3 Site Features

The Krasdale property is covered by impervious surfaces (generally asphalt and warehouse buildings). Based on survey information provided by New York City Economic Development Corporation, topography in the area of the subject storm sewer is relatively flat (less than 1 percent), and slopes east, towards the Bronx River. The site is surrounded by a chain-link fence and receives relatively heavy tractor trailer traffic throughout the day.

As shown on Design Drawing 2 – Existing Conditions of Appendix B of the IRMWP, OU-1A consists of the storm sewer located along the northern end of the asphalt parking lot that discharges to Outfall OF-1. Associated catch basins are bordered to the north by a stone curb, and the eastern two-thirds of the storm sewer is bordered to the north by an approximately six-foot wide asphalt walkway.

1.2 Project Description

Remedial activities at the site include: the establishment of construction support areas; installation of a sheet pile wall around the existing storm sewer to be replaced; excavation of the material within the limits of the sheet pile wall to a depth of two feet below the existing piping and inlet structures; installation of a two-foot-thick low permeability layer beneath the new storm sewer piping and inlet structures; installation of approximately 450 feet of new storm sewer; backfill to pre-construction grades; and site restoration.

The project work area is approximately 1.7 acres, which includes construction support areas. The design for the storm sewer replacement at the site is included in Appendix B of the IRMWP.

1.2.1 Post-Construction Site Condition

The post-construction surface will consist of new asphalt pavement of similar construction to the asphalt parking lot containing the existing storm sewer to be replaced. The final grading/restoration plan is presented in the Design Drawings provided in the IRMWP. The proposed topography will maintain a slope of 1 percent or less across the restored areas and runoff patterns within the parking lot will generally remain consistent with existing conditions (i.e., to the east and north).

1.3 Soil and Groundwater

A review of available soil information included in the Pre-Design Investigation Report – Krasdale Foods, Inc., Leasehold (Con Edison 2013), along the alignment of the existing storm sewer to Outfall OF-1, indicates a predominance of impervious surfaces (i.e., asphalt) over layers of fill; purifier waste; silt and clay with fine sand; sand and gravel fill (along the Bronx River); and sand and weathered bedrock (located beneath the other four layers).

Groundwater at the site, along the alignment of the existing storm sewer to Outfall OF-1, typically ranges from 5 to 9 feet below ground surface depending on tidal activity.

1.4 Stormwater Run-On and Runoff

Stormwater run-on to the property is negligible because run-on from upgradient area is diverted by the railroad tracks to the west. Pre-construction runoff from the site flows toward the existing storm sewer system to be replaced. The post-construction stormwater runoff will follow the same general pattern and direction as pre-construction runoff (trending to the east and north).

During construction, water that accumulates within the sheet pile wall will be collected, containerized and disposed of off-site at a Con Edison pre-approved facility following primary treatment (i.e., suspended solids removal) through an on-site temporary treatment system. Water outside of the sheet pile limits (i.e., storm water runoff) that would have otherwise been collected and conveyed by the subject

storm sewer will be diverted towards the Bronx River as overland flow. Sediment loading from the overland storm water flow will be managed via erosion and sedimentation controls.

1.5 Potential Pollution Sources

The following is a list of potential pollutants that may adversely affect stormwater quality during construction activities:

- Sediment
- Vehicle and equipment fluids (e.g., fuel, grease, coolant, oil)
- Concrete debris and/or wash water
- Miscellaneous debris from clearing and grubbing operations
- General litter or other project-derived waste

Best management practices (BMPs), as described below in the remaining sections of this SWPPP, will be utilized to reduce potential for the unwanted release of pollutants, including sources of sediment to stormwater.

1.6 State Pollution Discharge Elimination System General Permit

Remedial activities that are performed under a NYSDEC-approved remediation work plan, similar to this project, are not required to obtain coverage under the NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-10-001; referred to herein as SPDES General Permit), as long as a SWPPP has been prepared that meets the substantive requirements of the SPDES General Permit. SPDES General Permit exemption is identified in item number 20 on the SPDES General Permit Notice of Intent (NOI). The SPDES General Permit NOI will be filed for notification purposes only in accordance with the NOI instructions. The SPDES General Permit has been included as Appendix A for informational/reference purposes.

2. Construction Sequence

The purpose of this section is to outline the general sequence of activities that will take place prior to, during, and following construction at the Site with regard to the implementation of erosion and sedimentation control measures. The anticipated duration to complete the construction activities is approximately 20 weeks. Specific construction activity sequencing may change depending on field conditions. ARCADIS will work with Con Edison and the Contractor performing the work to ensure that any changes to the sequence will be protective of stormwater quality. The sequence of activities will include the following items described below.

- Obtain appropriate permits and approvals from regulatory agencies (i.e., NYSDEC).
- Conduct pre-remediation waste characterization sampling on soil to be excavated.
- Hold pre-construction meeting prior to mobilization.
- Begin Contractor mobilization.
- Establish work areas, stockpile/staging areas, and limits of clearing.
- Establish vehicle and equipment parking areas.
- Identify and mark all utilities and other critical site features to be protected.
- Install erosion and sedimentation controls per the requirements of this SWPPP (see Design Drawings included as Appendix B of the IRMWP). The primary controls to be installed first will include the reinforced silt fence along the northern and eastern portions of the contractor staging area and the temporary access road.
- Perform vegetative clearing and grubbing activities within the area designated for contractor use and install equipment and material laydown area, decontamination area; mobilize office trailers; establish electrical service; and mobilize portable sanitary facilities, etc. within the designated area.

- Perform pre-construction site assessment to confirm all appropriate erosion and sedimentation controls are in place and properly installed.
- Deploy work zone air monitoring equipment for monitoring.
- Install and operate temporary on-site water management system.
- Install excavation support system (i.e., steel sheet piling) and excavate a trench.
- Remove existing storm sewer system including catch basins and piping.
- Install new storm sewer piping and catch basins over minimum 2-foot thick controlled low-strength material (CLSM) mud mat.
- Backfill around piping, flanged connections, and portion of each catch basin with CLSM to an elevation of 2 feet above the top of the pipe.
- Backfill the remaining trench with general fill and restore surfaces to pre-construction conditions (i.e., asphalt).
- The Oversight Engineer will perform weekly inspections, in accordance with this SWPPP, to confirm erosion and sedimentation controls are installed, being maintained, and are suitable to meet the objectives of the SWPPP (refer to Section 3.2 for inspection requirements).
- Remove all construction equipment, materials, support facilities, temporary erosion and sedimentation controls, and project-derived waste from the site after final stabilization.
- Perform final site inspection in accordance with Section 3.4, and remove any remaining temporary erosion and sedimentation controls (e.g., reinforced silt fence).
- Complete Contractor demobilization.

3. Erosion and Sedimentation Control Plan

The Contractor will be responsible for installing and maintaining all temporary erosion and sedimentation control measures required during construction activities. All erosion and sedimentation controls will be installed and maintained in accordance with the latest edition of the New York Standards and Specifications for Erosion and Sediment Control prepared for the NYSDEC by the New York State Soil and Water Conservation Society (New York State Standards and Specifications; NYSDEC 2005) and in coordination with Con Edison's on-site representative. Temporary erosion and sedimentation control measures will be installed prior to initiation of soil disturbance activities. The Contractor will also be responsible for providing additional erosion and sedimentation control measures, as needed, to achieve the stormwater management objectives of this SWPPP.

3.1 Erosion and Sediment Control Measures

This section provides a brief description of the erosion and sedimentation control measures considered for implementation at the site. Installation locations for selected control measures and construction details are presented on the Design Drawings (Appendix B of the IRMWP).

3.1.1 Site Planning & Prevention Measures

This project will implement the following site planning and prevention measures for effective temporary and final erosion control during construction:

- The weather forecast will be monitored daily by the Oversight Engineer in an effort to anticipate significant rain events (i.e., a rain event that is capable of generating surface runoff at the site). The Contractor will plan to avoid performing ground disturbing activities during significant rain events to the extent practical.

- The area of ground disturbing operations will be controlled such that the Contractor is able to implement erosion and sedimentation control BMPs quickly and effectively.

- The Contractor and the Oversight Engineer will work together to properly plan and sequence construction events in an effort to minimize the time that imported

fill materials are exposed. For example, the site area may be partially restored as areas achieve final grade.

- Temporary stockpiles of imported fill material will typically be located in upland areas out of areas of significant runoff, including wetland regulated areas. Additional stormwater perimeter controls may be required at downgradient locations.

- Stockpiles of fill material left in place overnight or prior to a rain event must be placed on and covered with 9 mil plastic sheeting or a suitable binding agent to avoid becoming dislodged and entrained in stormwater runoff. Perimeter controls such as reinforced silt fence will be installed around stockpiles on a case-by-case basis to be determined by the Oversight Engineer.

- Restore the surface (i.e., achieve the design grade and restore the asphalt surface) as soon as possible per the Design Drawings and specifications provided as Appendix B of the IRMWP.

- During construction, the storm sewer pipe will be plugged using inflatable bladders to prevent water flow into the Bronx River. Any accumulated water will be managed on-site via the Water Management System.

3.1.2 Temporary Access Road

A temporary gravel access road will be constructed to provide a stabilized surface for construction vehicles crossing Parcel D and minimize disturbance of Parcel D soils.

3.1.3 Stabilized Construction Entrance

A stabilized construction entrance will be installed at all points of construction vehicle ingress and egress to Parcel D to minimize the potential for off-site tracking of sediments. It is the responsibility of the Contractor to inspect vehicles and equipment and confirm soil materials are not tracked onto any off-site areas as well as to maintain the construction entrance to manage/replace soil-laden stone with new clean stone.

3.1.4 Reinforced Silt Fence

Reinforced silt fence will be used to reduce the potential migration of suspended sediments from work areas to downgradient off-site areas. These are the primary sedimentation controls to be installed on this project. Reinforced silt fence will be installed along the northern and eastern (downgradient) edge of the work areas as shown on the Design Drawings (Appendix B of the IRMWP), and will be positioned parallel to the existing topography to the extent practical. Reinforced silt fence may also be installed around temporary stockpiles, construction staging areas, and as otherwise needed to control potential off-site migration of suspended sediments in sheet flow.

3.1.5 Dust Controls

Dust controls may include applying water to exposed soils, sweeping of roadways and other surfaces, covering excavation faces and material stockpiles with polyethylene sheeting, and minimizing excavation surface areas to be exposed at any one time during construction to reduce the potential for dust generation. Water for dust suppression will be applied such that runoff does not occur and excessive "water weight" is not added to the soil. The use of atomizing sprays is recommended so that excessively wet areas will not be created, while suppressing fugitive dust. Fugitive dust generated during construction activities will be monitored in accordance with the Community Air Monitoring Program and controlled on an as needed basis.

3.1.6 Good Housekeeping Practices

Good housekeeping will be implemented at the site to reduce the potential for construction materials entering stormwater from the site. During construction, the Contractor will be responsible for maintaining the site in a neat and orderly fashion. This will include, but not necessarily be limited to the following:

- Routine waste management activities, including the collection and disposal of trash, construction waste, and sanitary wastes;
- Prompt cleanup of spills of liquid or dry materials (if any); and
- Prompt cleanup of sediments (if any) inadvertently tracked by construction vehicles and/or transported by wind or stormwater from active work areas to other areas of the site or nearby off-site areas.

3.1.7 Vehicle Maintenance and Material Storage Area

The Contractor will perform vehicle/equipment maintenance activities and will store construction materials (such as fuels and BMP materials) in a designated area to prevent a potential release to stormwater. Construction materials (such as general fill, CLSM, asphalt concrete paving materials) and any fuel or fluids that could adversely impact stormwater must be properly covered, contained, or placed in a temporary shed or enclosure. In addition, any fluid-containing vehicles and equipment parked or left inactive for either (1) work shift, or longer (e.g., overnight), and/or (2) not used on a shift but still on-site will be staged on two layers of 6-mil polyethylene sheeting, minimum, and bermed on all four sides to prevent precipitation run-off from this containment. Additionally, precipitation within the containment area will be pumped-off and collected (if any evidence of sheen/contamination) so as to prevent overflow of liquids from these containment areas.

3.2 Inspection and Maintenance of Erosion and Sedimentation Controls

3.2.1 Inspection and Contractor Notification Requirements

Inspections of erosion and sedimentation controls will be performed as a quality control procedure to confirm that this SWPPP is being implemented properly and remains functional relative to site conditions. Prior to initiation of land disturbing activities, a qualified inspector to be identified by the Oversight Engineer (as defined in the SPDES General Permit) will perform a pre-construction site assessment to verify that erosion and sedimentation controls are properly installed and functional.

During construction activities, all erosion and sedimentation control measures will be inspected for deficiencies or required maintenance by the Oversight Engineer, a qualified inspector, at least once every seven calendar days (refer to Section 3.3 for information pertaining to the documentation of erosion and sedimentation controls inspections). The Oversight Engineer will notify Con Edison's representative(s) and appropriate Contractor (or subcontractors) of any corrective actions that need to be taken within one business day following completion of the inspection.

3.2.2 Inspections during Project Shutdown

If soil disturbance activities have been shut down with partial project completion, all areas disturbed (as of the project shutdown date) have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with this SWPPP and are operational, the qualified inspector can stop performing inspections. If soil disturbance activities are not resumed within two years from the date of shutdown, the qualified inspector will perform a final inspection to certify that all disturbed areas have achieved final stabilization; all temporary erosion and sedimentation control measures have been removed; and that all post-construction stormwater management practices have been completed in conformance with this SWPPP. The NYSDEC will be notified prior to terminating weekly inspections.

3.2.3 Maintenance Requirements

Maintenance or repair of installed erosion and sedimentation controls will be initiated within one business day following notification of deficiencies and completed no more than five calendar days following notification of required corrective actions. Erosion and sedimentation control measures will be maintained for the duration of the project until such time as all permanent stabilization measures have become fully established and a final site inspection (described below in Section 3.4) has been performed by a qualified inspector.

3.2.4 Contractor Training and Compliance Certification Requirements

The Contractor and subcontractors involved in soil-disturbing activities will identify at least one person from their company that is responsible for implementation of this SWPPP. This individual will have completed the requirements to be considered a “trained contractor” in accordance with the SPDES General Permit (Appendix A). At least one trained contractor must be on site on a daily basis when soil-disturbing activities are being performed. Note that the trained contractor cannot perform the duties of the qualified inspector, unless the trained contractor also meets the qualified inspector qualifications included in the SPDES General Permit. The Oversight Engineer will be responsible for perform the weekly inspections.

Contractors and subcontractors performing activities that could impact stormwater will be required to sign the contractor compliance form provided in Appendix B of this

SWPPP. The contractor compliance form, in summary, certifies that they have read, understand, and will adhere to this SWPPP.

3.3 Recordkeeping

The following reporting and recordkeeping requirements will be followed for the project:

- *SWPPP (and related documents)* – A copy of this SWPPP, Notice of Intent (NOI), inspection reports, contractor compliance certification, and any other relevant documents will be retained at the site (e.g., construction trailer or nearby office) from the date of initiation of construction activities to the date of final stabilization as described below in Section 3.4. These documents will be retained in a secured location readily available to individuals performing compliance inspections.

- *Weekly Inspections Reports* – In accordance with Section 3.2.1, erosion and sedimentation controls will be inspected, at a minimum of once every 7 calendar days. Inspection reports will be used to document the results of the inspections and will include the following:

  - Date and time of inspection

  - Name and title of person(s) performing the inspection

  - A description of the weather and soil conditions (e.g., dry, wet, saturated) at the time of the inspection

  - A description of the condition of the runoff at all points of discharge from the construction site, including any discharges of sediment and discharges from conveyance systems (i.e., pipes, culverts, and ditches) and over-land flow

  - A description of the condition of all natural surface water bodies located within or immediately adjacent to the property boundaries of the construction site, which receive runoff from disturbed areas

  - Identification of all erosion and sedimentation control measures that need repair or maintenance

- Identification of all erosion and sedimentation control measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced

- A description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection

- Current phase of construction of all post-construction stormwater management measure(s) (if applicable), and identification of all construction that is not in conformance with this SWPPP and IRMWP

- Corrective action(s) that must be taken to install, repair, replace, or maintain erosion and sedimentation control measures and correct deficiencies identified with the installation of the post-construction stormwater management measure(s) (if applicable)

- Digital photographs with date stamp that clearly show the condition of all measures that have been identified as needing corrective actions, as well as photographs showing the condition of the measure(s) after the corrective action has been completed.

All inspection reports will be signed by the Oversight Engineer and copies maintained on site as described above. An inspection report template is included in Appendix C.

· *Records Retention* – Copies of this SWPPP, NOI, and any reports submitted or prepared in conjunction with this SWPPP will be retained for a period of at least 5 years following completion of the work.

3.4 Site Restoration

At the completion of grading activities, the trench excavation will be restored with asphalt pavement. A final site inspection will be performed and documented to verify that all disturbed areas are suitably stabilized (i.e., with at least 85 percent perennial vegetative cover (if required) following removal of contractor equipment and material staging areas and temporary access road, rock riprap, or impervious cover [e.g., asphalt]). If disturbed areas are not sufficiently stabilized, then measures will be implemented to correct the substandard areas and a second final site inspection will

be performed. Following successful completion of the final site stabilization, the Contractor will remove any temporary erosion and sedimentation control features that are no longer needed (e.g., reinforced silt fencing), as appropriate.

4. Pollution Prevention Controls

4.1 General

In addition to the good housekeeping practices described above under Section 3.1.5, the Contractor will implement measures to prevent spills from occurring and to properly respond to spills/spill-related emergencies. The Contractor will also adhere to all applicable regulations for construction and Con Edison's site management procedures in the event of a spill. At a minimum, the following pollution prevention procedures will be implemented by the Contractor during construction.

4.2 Spill Prevention Plan

Prior to mobilization, each piece of equipment to be brought on site will be visually inspected by the Oversight Engineer for, but not limited to, potential sources of spills of hydraulic fluid, engine oil, transmission fluid, fuel, and grease (e.g., by inspecting the condition of hydraulic cylinders, hoses, gaskets, fuel tanks) as well as potential sources of off-site contamination (e.g. mud, vegetation). If a potential spill source is identified, the Contractor will make the necessary repairs or replace the piece of equipment prior to entering the Site. At a minimum, the construction site will be equipped with at least one spill kit consisting of sorbents, absorbent booms, and fire extinguishers.

The Contractor will take the following precautions to minimize potential spills of fuel during the construction activities:

- Place secondary containment measures under and around all fuel storage tanks.
- Perform refueling activities on level ground within vehicle/equipment maintenance and fueling area, which is away from steep slopes and runoff conveyance features (e.g., ditches, storm sewers).
- Do not leave equipment unattended during refueling.
- Smoking is not permitted at any location in the project area.
- Do not refill fuel tanks while the engine is running.
- Replace fuel caps before starting the engine.

- Secure fuel pump dispensers (i.e., lock) when not in use to avoid accidental fuel release.

- Perform inspections and tests of equipment and portable fuel tanks to check for leaks and evaluate the condition of hydraulic hoses and connections. If leaks are observed, transfer the contents to an alternate tank/storage unit and replace the equipment/tank or repair the leak, as appropriate.

- Maintain all equipment in accordance with the manufacturer's specifications.

- Operate all vehicles and equipment safely and park them a safe distance away from site hazards and sensitive resources.

4.3 Spill Response Plan

The Contractor will be responsible for implementing appropriate spill response procedures when responding to releases of, but not limited to, oil, products, and materials during the performance of construction activities. At a minimum, spills will be immediately reported to the personnel listed below:

- Contractor's Project Manager
- Oversight Engineer

Names and phone numbers of these personnel will be included in the phone number list described below. Reporting of spills to necessary agencies will be coordinated by the appropriate Con Edison representatives, in accordance with applicable regulations. The Contractor will be responsible for implementing appropriate spill response procedures, which may include the following:

1. *Ceasing Operation of the Affected Equipment*: This will consist of shutting off the equipment and/or closing any valves and stopping the leak, if possible.

2. *Containing the Spill*: If the spilled material is floating on a water surface, spill-absorbent pads/booms will be placed across the path of the floating spill. If the spilled material sinks below the water surface, a dam, weir, or other containment method will be used to stop the flow of the spilled material. If the spill occurs on land, a ditch, dam, or other containment unit will be constructed to stop the flow of the spilled material. Absorbent material will be applied as necessary.

3. *Cleaning Up the Spill*: Spills in water will be recovered using, but not limited to, pumps and sorbent material, as necessary, until the spilled material is recovered (and no sheen or other evidence of the spill is observed on the water surface). Spills on land will be recovered using pumps, sorbent material, hand tools, and/or heavy equipment, as necessary, until the spilled material is recovered. Other activities to be performed during spill cleanup activities include removing impacted soil/sorbent pads and using rags and cleaning solution to remove excess spilled material from equipment.

4. *Containerizing Spill Materials*: Spilled materials, including, but not limited to, impacted soil and sorbent pads will be containerized in United States Department of Transportation-approved containers. The containers will be labeled with the waste type and date of accumulation in accordance with applicable regulations. Samples will be collected to characterize the spilled materials for disposal, as required.

5. *Disposing Spill Materials*: Impacted materials and spill cleanup debris will be disposed at a facility permitted to accept such materials and who are Con Edison approved to accept waste from a Con Edison project. The Contractor will be responsible for coordination and costs associated with disposal activities in accordance with applicable regulations.

6. *Performing Post-Spill Maintenance*: Following cleanup of the spill, the Contractor's project manager will verify that all used spill cleanup material and equipment has been disposed or decontaminated, as appropriate. If the equipment that caused the spill cannot be properly repaired, replacement equipment will be obtained.

4.4 Emergency Coordination Plan

In the event of a spill and/or emergency, the Contractor's project manager will complete (at a minimum) the activities described below:

- Notify appropriate site security personnel of the nature of the emergency.

- Inform site personnel of any potential hazards and required levels of personal protective equipment to conduct the cleanup.

- Record the following information pertaining to the spill:

- Name of the person who identified the spill incident
- Date, time, and location (include address and appropriate phone number) of the spill incident
- Brief description and cause of the spill incident
- Estimated quantity and type of material spilled
- Extent and description of impacts to soil, sediment, and water from the spill
- Any damages or injuries caused by the spill
- Actions being used to stop, remove, and mitigate the effects of the discharge

If there is an immediate threat to human health and/or the environment (based on observations of the spill incident), Con Edison's representative will notify the appropriate authorities (i.e., local police, fire departments, hospitals, and state and local emergency response teams). As indicated above, Con Edison will also coordinate spill reporting to the appropriate agencies (e.g., NYSDEC). To facilitate the preparation of reporting documentation in a timely manner, the Contractor will provide a copy of the above-identified information to Con Edison's on-site representative.

4.5 Contact Personnel

The Contractor will prepare a list of contact names and phone numbers for the following personnel and/or organizations:

- Con Edison (primary contact)
- Oversight Engineer
- Contractor personnel
- Local hospital
- Local ambulance service
- Local fire department
- Local, county, and state police department

The list of project contacts will be posted in a common, readily accessible area (i.e., interior wall of the construction trailer).

5. Post-Construction Stormwater Management

5.1 Water Quality Controls

In accordance with Table 1 of the SPDES General Permit (Appendix A of this SWPPP), a SWPPP for this type project (i.e., underground utility replacement) does not need to include post-construction stormwater controls for water-quality or quantity (e.g., stormwater basins). However, as described above, temporary and permanent erosion and sedimentation control measures will be employed both during and following remedial activities to limit the potential for erosion and offsite migration of sediments. As discussed in the IRMWP, the project site will be restored to pre-construction conditions and no net increase in impervious surfaces will result. Pervious portions of the surface cover (i.e., geotextile overlain by stone) placed in the area for contractor use will remain in this area as they serve as a barrier to potential contact with impacted soils on that parcel.

6. References

Consolidated Edison Company of New York, Inc. 2013. Pre-Design Investigation Report – Krasdale Foods, Inc., Leasehold. June 28, 2013.

New York State Department of Environmental Conservation. 2005*. New York Standards and Specifications for Erosion and Sediment Control.* August 2005.

ARCADIS

Appendix A

NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-10-001)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010 Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

William R. Adriance — January 28, 2010
Authorized Signature — Date

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES

TABLE OF CONTENTS

Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application - This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and the *ECL* for any *discharge* to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

C. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects that:

    a. are tributary to waters of the state classified as AA or AA-s; and

(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

(Part II. A.2)

This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. <u>Permit Authorization</u>

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied <u>all</u> of the following criteria:

    a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

    b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Regional Office in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

    c. the final SWPPP has been prepared, and

    d. an NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (NOT) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

    a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

    b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

    d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

    e. The *owner or operator* shall include the requirements above in their SWPPP.

4. The Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4,* the *owner or operator* shall notify the *MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. Permit Coverage for Discharges Authorized Under GP-0-08-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1.. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

   Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*.

(Part III. A)

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

    a. whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater *discharges* from the site;

    b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP.

(Part III. A. 6)

The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

> "I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

(Part III. A. 8)

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project;

(Part III. B. 1)

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater discharge(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each construction activity that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of final stabilization;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

(Part III. B. 1)

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.

2. Post-construction stormwater management practice component - All construction projects identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, the post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project;

(Part III. B. 2)

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.g. above.

(Part III. C)

C. Required SWPPP Components by Project Type - Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Owner or Operator Maintenance Inspection Requirements

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

(Part IV. C)

C. <u>Qualified Inspector Inspection Requirements</u> - The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

    a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

    d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

    a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

    a. Date and time of inspection;

    b. Name and title of person(s) performing inspection;

    c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

    d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

    e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

    f. Identification of all erosion and sediment control practices that need repair or maintenance;

    g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

    h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

(Part V. A. 2)

a. Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT, certify that all disturbed areas have achieved *final stabilization;* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall also have the MS4 sign the "MS4 Acceptance" statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the "MS4 Acceptance" statement. The MS4 official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector's* final site inspection certification(s) required in Part V.3.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

(Part V. A. 5)

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention - The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

B. Addresses - With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply - The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied.

(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

B. Continuation of the Expired General Permit - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. Enforcement - Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense - It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate - The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information - The *owner or operator* shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation of this permit.

The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester's expense.

G. Other Information - When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any other report, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s)

changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or impervious area), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. <u>Signatory Requirements</u>

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        i. a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

        ii. the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

    b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

    c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

        i. the chief executive officer of the agency, or

(Part VII. H. 1. c)

ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.H.1.;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

   c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. <u>Property Rights</u> - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity.*

J. <u>Severability</u> - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, the Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger authorized to discharge under a general SPDES permit for the same discharge(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. <u>Proper Operation and Maintenance</u> - The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

(Part VII. M)

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. Permit Actions - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions - Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

R. Other Permits – Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "Construction Activity(ies)" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

Groundwater - means waters in the saturated zone. The saturated zone is a subsurface zone in

which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct construction activities are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
ii. Designed or used for collecting or conveying stormwater;
iii. Which is not a *combined sewer*; and
iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from construction activity.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in Parts 700 et seq of this Title.

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means construction activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* will be responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other agricultural building, silo, stock yard or pen.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Bike paths and trails
- Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* and *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4

Figure 1 - New York City Watershed East of the Hudson

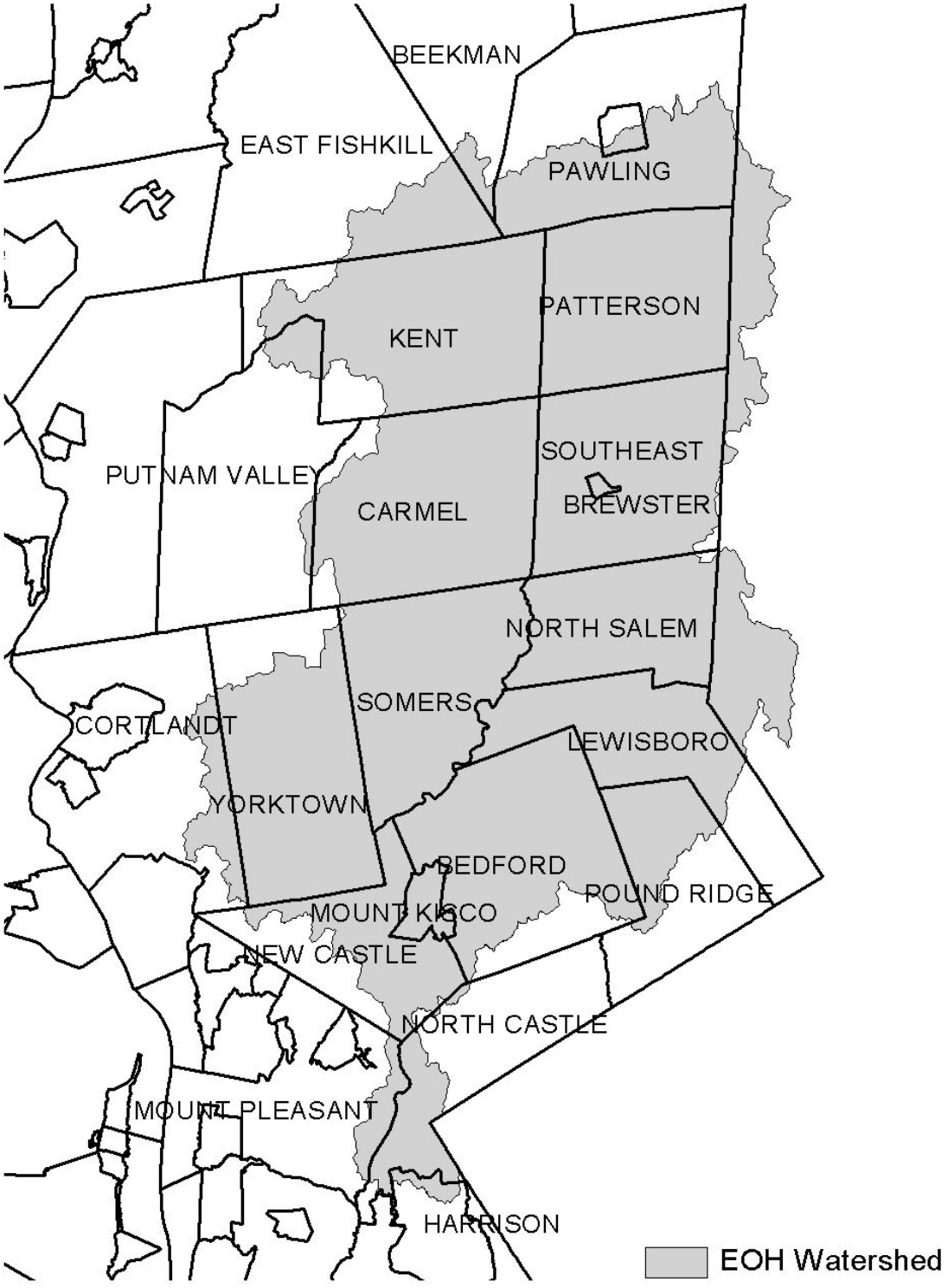
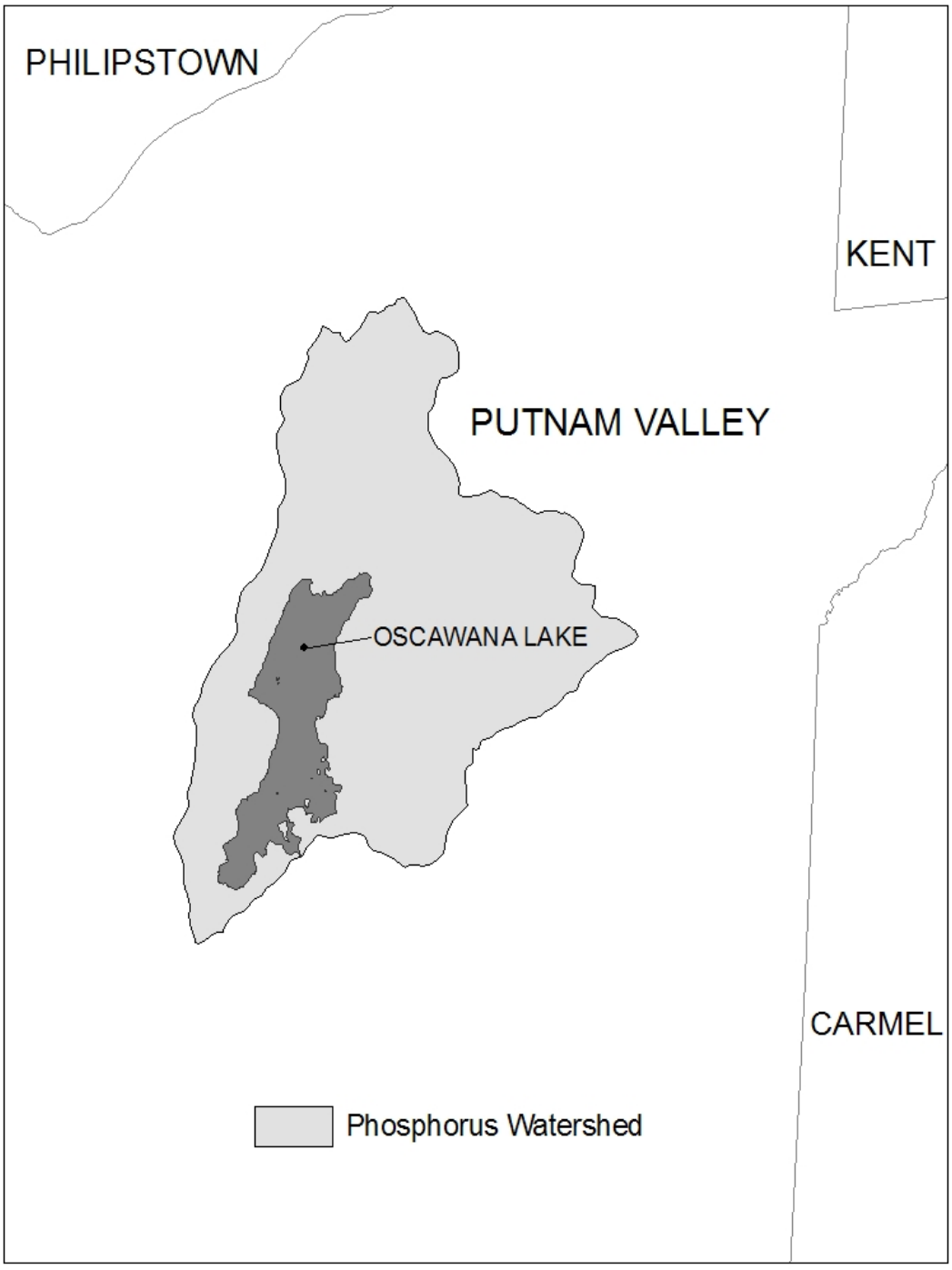


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed



APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Beaver Lake
Broome	White Birch Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Dutchess	Rudd Pond
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county listed as Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Tonawanda Creek, Upper, and minor tribs
Genesee	Little Tonawanda Creek, Lower, and tribs
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs
Onondaga	Onondaga creek, Middle and tribs
Onondaga	Onondaga Creek, Upper, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Saratoga	Schuyler Creek and tribs
Schenectady	Collins Lake

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or nutrients.

APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD, PO BOX 220 WARRENSBURG, NY 12885-0220 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

ARCADIS

Appendix B

Contractor Compliance Form

Contractor and Subcontractor Certification/Agreement

STORMWATER POLLUTION PREVENTION PLAN

Project Title: _____

Project Site Address: _____

Operator(s): _____

As a contractor/subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the construction site.

Each contractor/subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect, or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil, and/or administrative proceedings.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Elements of SWPPP for which my Company is responsible: _____

_____

_____

Name and Title of trained individual(s) responsible for SWPPP implementation:

Name: _____

Title: _____

Signature: _____

Title: _____

Date: _____

ARCADIS

Appendix C

Inspection Form

Erosion and Sediment Control Inspection Form

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

1) Date and time of inspection:

2) Name of Qualified Inspector(s):

3) Weather Conditions:

4) Soil Conditions (e.g., dry, wet, saturated):

5) Description of runoff at the time of inspection (e.g., clear, muddy):

6) Description of Receiving Water Body Conditions (e.g., clear, muddy):

7) Identify all erosion and sediment controls that need repair or maintenance. Describe below and/or attach a site plan indicating repair locations:

8) Identify all erosion and sediment controls not installed properly or are not functioning as designed that need to be repaired or replaced. Describe below and/or attach a site plan indicating repair locations:

9) Describe below and/or show on a site plan areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection:

Erosion and Sediment Control Inspection Form

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

10) Attach digital photographs, with date stamp, which clearly show the condition of all practices that have been identified as needing corrective actions. The qualified inspector shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The qualified inspector shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed.

ARCADIS

Appendix D

Notice of Intent

This page was intentionally left blank.

ARCADIS

Appendix E

Community Air Monitoring Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Consolidated Edison Company of New York, Inc.

Community Air Monitoring Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

September 2014

Community Air Monitoring Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former
Manufactured Gas Plant

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc
6723 Towpath Road
P O Box 66
Syracuse
New York 13214-0066
Tel 315 446 9120
Fax 315 449 0017

Our Ref.:
B0043027.0000

Date:
September 2014

ARCADIS

Table of Contents

ARCADIS

Community Air Monitoring Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Manufactured Gas Plant
Bronx, New York

1. Introduction

This *Community Air Monitoring Plan* (CAMP) has been prepared to support the implementation of a storm sewer replacement on the Krasdale Food Inc., Leasehold at the Consolidated Edison Company of New York, Inc.'s. (Con Edison's) Hunts Point Former Manufactured Gas Plant (MGP) Site located in Bronx, New York (site).

The purpose of this CAMP is to describe the monitoring activities that will be conducted by the Oversight Engineer to detect potential airborne releases of constituents of concern during the storm sewer replacement activities. This CAMP specifies the air emission action levels, air monitoring procedures, monitoring schedule and data collection and reporting to be performed during the implementation of remedial activities. As indicated in Specification Section 02 50 70 – Vapor, Odor and Dust Control, the Oversight Engineer is responsible for providing all labor, materials and equipment necessary to implement the community air monitoring program specified herein. Nevertheless, it is ultimately the Contractor's responsibility to confirm that all corrective measures associated with the community air monitoring program (including the control of dust, vapors and odors) are performed in accordance with this CAMP.

1.1 Site Location and Description

The site is located in the Borough of Bronx (Bronx), New York City, Bronx County, New York. The Krasdale leasehold property is an approximately 11-acre tract of land on the eastern portion of Hunts Point, a peninsula at the confluence of the Bronx and East Rivers. The Krasdale property is bounded by Food Center Drive to the west, Parcel D to the north, Parcel C to the south, and the Bronx River to the east, and includes Parcel F. As indicated above, the referred-to parcels were designated as part of the larger planned investigation and remediation of the Hunt's Point former MGP. The site formerly housed an MGP that manufactured gas from 1926 to approximately 1962.

The Krasdale property is currently zoned as manufacturing (M3-1). M3 zoning districts are designated for areas with heavy industries that generate noise, traffic or pollutants. Typical uses include power plants, solid waste transfer facilities and recycling plants, and fuel supply depots (2013 NYC Department of City Planning).

The Krasdale property is currently used as a warehouse facility for shipping and receiving of food products.

The Krasdale property is covered by impervious surfaces (generally asphalt and warehouse buildings). Based on survey information provided by New York City Economic Development Corporation (NYC EDC), topography in the area of the subject storm sewer is relatively flat

(less than 1 percent), and slopes east, towards the Bronx River. The site is surrounded by a chain link fence and receives relatively heavy tractor trailer traffic throughout the day.

The existing storm sewer consists of a buried 12- and 20--inch diameter reinforced concrete pipe (RCP) that conveys stormwater west to east across the western portion of the site. The storm sewer is approximately 400 feet long between upstream manhole (#113), located near the north boundary of the Krasdale property, and Outlet Fall 1 (OF-1) discharging into the Bronx River. This section of sewer conveys stormwater from the northern portion of the Krasdale property parking lot.

1.2 Summary of Storm Sewer Replacement

The storm sewer replacement primarily includes: (1) excavation of soils and removal of the existing storm sewer structures to facilitate installation of the new storm sewer; (2) off-site treatment/disposal of the excavated materials; (3) installation of new storm sewer; (4) backfilling of the excavated areas; and (5) performance of various restoration activities.

Additional details regarding the remedial activities are provided in the IRMWP.

1.3 Potential Air Emissions Related to Remedial Activities

As defined in the New York State Department of Health (NYSDOH) Generic CAMP (Exhibit I), intrusive remedial activities to be performed at the site have the potential to generate localized impacts to air quality. Remedial components that have the potential to generate air emissions include, but may not be limited to, the following:

- Installation of steel sheet piling for the excavation support system.
- Excavation to the limits shown in the Design Drawings.
- Material handling (e.g., separation of large debris from soils, manipulation of excavated materials to render them suitable for off-site treatment/disposal, loading materials for transport to the off-site treatment/disposal facility).
- Other ancillary intrusive activities.

1.4 Air/Odor Emissions and Control Measures

Air emissions control and fugitive dust suppression measures will be implemented by the Contractor concurrently with the activities identified above (as needed) to limit the potential for organic vapor and dust emissions from the site. Air emissions associated with excavation/backfilling, material handling and stockpiling, other intrusive activities, and certain non-intrusive activities, such as mobilization, transportation and restoration activities, will be controlled as described below. The following vapor and dust control measures may be used during these activities, depending upon specific circumstances, visual observations, and air monitoring results:

- Water/BioSolve® spray.
- Polyethylene sheeting (e.g., for covering excavation faces, material storage containers).
- Applying a water spray to suppress dust originating from excavation, fill material off-loading, and vehicle traffic.
- Minimizing excavation surface area to be exposed at any given time.
- Vapor suppression / Rusmar® foam.
- Limiting travel speed and applying water to gravel haul roads, if needed.

The Contractor is required to mobilize BioSolve® (or approved equivalent) and Rusmar® (or approved equivalent) vapor-suppressant foam (including application equipment) to the site prior to initiating intrusive activities. The Contractor shall maintain an adequate supply of such materials for the duration of intrusive activities. The Contractor shall apply the BioSolve® solution using a pressure washer. If required, a dedicated Contractor worker shall be available for application of BioSolve® solution.

2. Air Monitoring Procedures

The Community Air Monitoring Program is intended to be a discrete program that will be operated in conjunction with the Exclusion Zone air monitoring program. The Oversight Engineer will conduct real-time community air monitoring throughout the remedial construction. Monitoring will be conducted at representative locations at the perimeter of the exclusion zone (work area) for volatile organic compounds (VOCs), hydrogen cyanide and hydrogen sulfide gases, and total suspended particulates (particulates). However, particulate monitoring will not be performed during precipitation events. Additional information regarding the monitoring locations, equipment, and action levels is presented below.

The daily data will be submitted weekly in an electronic format to Stephanie Selmer, NYSDOH at beei@health.state.ny.us; Ronnie Lee, New York State Department of Environmental Conservation (NYSDEC) at rslee@gw.dec.state.ny.us; Tracey Bell, NYC EDC at tbell@nycedc.com; and Yelena Skorobogatov , Con Edison at SkorobogatovY@coned.com. A hard copy of the data will be maintained at the Oversight Engineer's field office trailer.

2.1 Monitoring Location Selection and Deployment

Monitoring station locations will be determined daily based on data from the on-site meteorological monitoring station and the nature of the anticipated remediation activities. An upwind location for monitoring will be selected at the start of each workday. Two downwind (based on predominant wind direction and nearest receptor) locations for monitoring will also be selected. The monitoring stations will be deployed each day before the start of work activities. If wind direction shifts radically during the workday and for an extended period of time, such that the upwind location and downwind locations no longer fall within acceptable guidelines (+/- 60° compass change from the original wind direction), the monitoring stations will be relocated so that the upwind and downwind locations are maintained. Air monitoring location changes will be documented in a field logbook.

2.2 Volatile Organic Compounds (VOCs) Monitoring

Real-time monitoring for VOCs will be conducted during remedial activities at the site. As required by the NYSDOH Generic CAMP (Exhibit I), VOCs will be monitored continuously during all intrusive and/or potential dust-generating activities (e.g., installation of erosion and sedimentation control measures, sheet pile installation, excavation, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging

capabilities. A real-time VOC monitor (RAE Systems SentryRAE [or equivalent]), equipped with either a photoionization detector, or flame ionization detector, calibrated to 100 parts per million (ppm). Isobutylene will be used to monitor for VOCs and polycyclic aromatic hydrocarbons. All average concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to facilitate activity decisions will be recorded by using an electronic data logger and/or in the field logbook.

2.3 Hydrogen Cyanide Monitoring

Real-time monitoring for hydrogen cyanide will be conducted during remedial activities at the site. Hydrogen cyanide will be monitored continuously during all intrusive and/or potential dust-generating activities (e.g., installation of erosion and sedimentation control measures, sheet pile installation, excavation, backfilling, and material handling activities) using a real-time cyanide monitor (RAE Systems MultiRAE Pro [or equivalent]).If, at any time, hydrogen cyanide levels at or above 5 mg/m^3 are detected, work must be halted immediately and the area evacuated. The Oversight Engineer and the Construction Manager shall be notified immediately to determine further actions.

2.4 Hydrogen Sulfide Monitoring

Real-time monitoring for hydrogen sulfide will be conducted during remedial activities at the site. Hydrogen sulfide will be monitored continuously during all intrusive and/or potential dust-generating activities (e.g., installation of erosion and sedimentation control measures, sheet pile installation, excavation, backfilling, and material handling activities) using a real-time hydrogen sulfide monitor (Jerome 631X [or equivalent]). If, at any time, hydrogen sulfide levels at or above 5 parts per million (ppm) are detected, additional measurements will be collected to evaluate a 1-hour average. Work will be modified, controlled, limited, and/or ceased if the 1-hour average concentration exceeds 1 ppm. The Oversight Engineer and the Construction Manager shall be notified immediately to determine further actions.

2.5 Total suspended Particulate (Particulate) Monitoring

Real-time monitoring for particulates will be conducted during remedial activities at the site. As required by the NYSDOH Generic CAMP (Exhibit I), real-time airborne particulate monitoring will be conducted continuously during all intrusive and/or potential dust generating activities (e.g., installation of erosion and sedimentation control measures, sheet

pile installation, excavation, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time particulate monitor (MIE DataRAM PDR1000 [or equivalent]) will be used for particulate monitoring. All average concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to facilitate activity decisions will be recorded using an electronic data logger and/or in the field logbook.

Fugitive dust migration will be visually assessed during all work activities, and reasonable dust suppression techniques will be used during any site activities that may generate fugitive dust.

2.6 Action Levels

The action levels provided below are to be used to initiate corrective actions, if necessary, based on real-time monitoring. Each piece of monitoring equipment will have alarm capabilities (audible and/or visual) to indicate exceedances of the action levels specified below.

2.6.1 Action Levels for VOCs

As outlined in the NYSDOH Generic CAMP (Exhibit I), if the ambient air concentration for total VOCs exceeds 5 ppm above background (i.e., upwind location) for the 15-minute average, work activities will be temporarily halted while monitoring continues. If the total VOCs concentrations readily decrease (through observation of instantaneous readings) below 5 ppm above background, then work activities can resume with continuous monitoring.

If the ambient air concentrations for total VOCs persist at levels in excess of 5 ppm above background but less than 25 ppm above background, work activities will be halted, the source of the elevated VOC concentrations identified, corrective actions to reduce or abate the emissions undertaken, and air monitoring will be continued. Once these actions have been implemented, work activities can resume provided the following two conditions are met:

- The 15-minute average VOC concentrations remain below 5 ppm above background.
- The VOC concentration 200 feet downwind of the monitoring location or half the distance to the nearest potential receptor or residential/commercial structure (whichever

is less but in no case less than 20 feet) is below 5 ppm over background for the 15-minute average.

If the ambient air concentrations for total VOCs exceed 25 ppm above background, the work activities must cease, and emissions control measures must be implemented.

2.6.2 Action Levels for Particulates

As required by the NYSDOH Generic CAMP (Exhibit I), if the average ambient air particulate concentration (calculated for continuous 15-minute increments as specified above) at any one (or more) of the downwind perimeter locations exceeds 100 micrograms per cubic meter (µg/m^3) above the average background concentration (calculated for continuous 15-minute increments as specified above), or if airborne dust is visually observed leaving the work area, then dust suppression measures will be implemented, and air monitoring will continue. Work activities may continue following the implementation of dust suppression measures provided that the average ambient air particulate concentration does not exceed 150 µg/m^3 above the average background concentration.

If, after implementation of dust suppression measures, the downwind average ambient air particulate concentration is greater than 150 µg/m^3 above the average background concentration, work activities must be stopped and re-evaluated. Work activities may resume only if dust suppression measures and other corrective actions are successful in reducing the downwind average ambient air particulate concentration to less than 150 µg/m^3 above the average background concentration and if no visible dust is observed leaving the site. The particulate concentrations will be recorded in accordance with Section 2.3 above.

2.7 Meteorological Monitoring

Meteorological monitoring will be conducted continuously at the site using a portable meteorological monitoring system. The meteorological monitoring system will be deployed at a location in accordance with siting criteria established by the United States Environmental Protection Agency and the NYSDEC for meteorological monitoring systems *(Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements*, as revised August 1989; and New York State Air Guide-19 – "Oversight of Private Air Monitoring Networks," dated June 1989). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. Security and accessibility to the meteorological monitoring system will also be considered during the selection of the meteorological monitoring system

location. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity and ambient temperature. The meteorological monitoring system will be equipped with electronic data-logging capabilities. A digital meteorological monitoring system (AutoMet or equivalent) will be used to collect the meteorological data.

2.8 Instrument Calibration

Calibration of the VOCs, particulate, and meteorological monitoring instrumentation will be conducted in accordance with each of the equipment manufacturer's calibration and quality assurance requirements. The VOC and particulate monitors will be calibrated daily (at a minimum), and calibrations will be recorded in the field logbook.

3. Vapor Emission Response Plan

The *Vapor Emission Response Plan* (see Exhibit II) will be triggered for contractor worker safety by an exceedance of the 15-minute average VOCs concentration of 1.5 ppm (above background) within the Exclusion Zone. The contractor will initiate engineering controls for employee safety.

If an exceedance of the 15-minute average VOCs concentration of 5.0 ppm (above background) measured at the perimeter of the Exclusion Zone all excavation activities will be stopped and the following action will be taken:

- Continue total VOCs monitoring within the Exclusion Zone and perimeter of the Exclusion Zone. If the total VOCs level drops below 5.0 ppm (above background) then excavation activities can resume with the addition of engineering controls or modifications to the excavation process to minimize VOCs emissions. However if the VOCs level persists above 5.0 ppm, based on continual observance of the total volatile organic analyzer, then the contractor will immediately implement engineering controls such as misting the area with a vapor suppression solution of BioSolve®, covering excavation, backfilling required to reduce emissions and at the same time notify the Oversight Engineer.

- If after the implementation of additional engineering controls the total VOCs levels drop below 5.0 ppm (above background) within the Exclusion Zone and at the perimeter of the Exclusion Zone, then the excavation activity can resume provided process and work activities were adjusted to reduce emission levels

- If the total VOCs levels continue to be greater than 5.0 ppm (above background) at the perimeter of the Exclusion Zone then all site activities must be discontinued. When the work is shut down, downwind air monitoring as directed by Oversight Engineer in consultation with the NYSDEC representative will be implemented to ensure that the emission does not impact the nearest residential of commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan (Section 4.0).

- Primary engineering controls that may be implemented to reduce emission levels include:

    - Adding a vapor suppression solution of BioSolve® to impacted media (application in excavated areas will be a light mist as to avoid increasing solubility of wastes leading to potential groundwater contamination).

    - Limiting excavation size and the surface area of exposed soil.

4. Major Vapor Emission Response Plan

If after the cessation of the work activities and implementation of engineering controls, total VOCs levels exceed 5.0 ppm (above background) at the perimeter of the Exclusion Zone, then the following action will be immediately taken:

- Cover the excavation with polyethylene sheeting or clean soil.
- Notify Yelena Skorobogatov with Con Edison 718.204.4205; Ronnie Lee with the NYSDEC at 518.402.9662; Stephanie Selmer with the NYSDOH at 518.402.7870; and Tracey Bell with the NYC EDC at 212.312.3752.
- Continue real-time VOCs monitoring at the upwind, downwind and nearest receptor until VOCs level drop below 2.5 ppm.
    - If total VOCs levels persist above the 2.5 ppm (above background), Oversight Engineer and NYSDEC on-site representative will consult with each other and the emergency response agencies to determine the appropriate actions to be implemented. The Owner/ Oversight Engineer have ultimate authority during major vapor emission emergencies. The NYSDEC must approve any action to continue work following such an event.

ARCADIS

Exhibits

Exhibit I

Generic Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

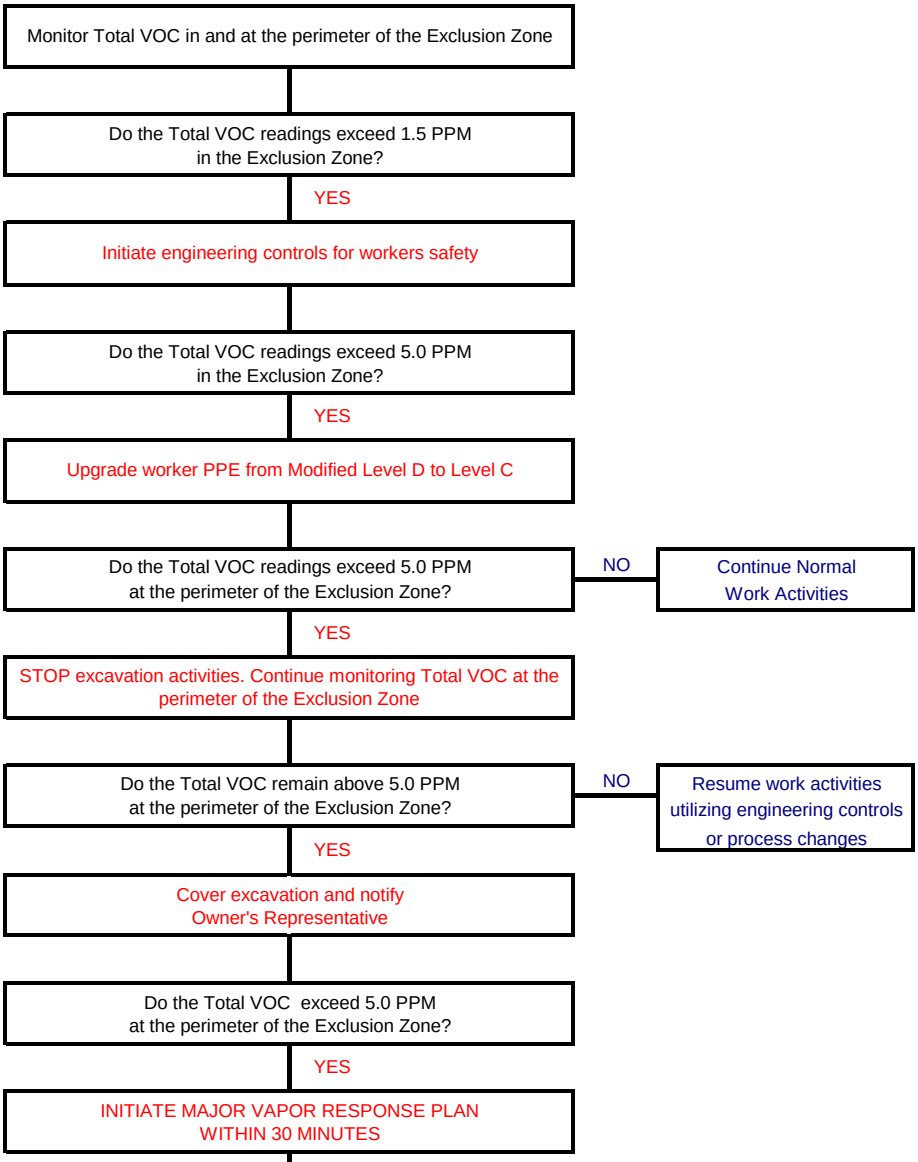
June 20, 2000

P:\Bureau\Common\CommunityAirMonitoringPlan (CAMP)\GCAMPR1.DOC

Exhibit II

Vapor Emission Response Plan
Flowchart

HUNTS POINT
FORMER MANUFACTURED GAS PLANT SITE
VAPOR EMISSION RESPONSE PLAN



1. Notify Con Edison Yelena Skorobogatov at (718) 204-4205, NYSDEC Ronnie Lee at (518) 402-9662, NYSDOH Stephanie Selmer at (518) 402-7870, and NYCEDC Tracey Bell at (212) 312-3752
2. Total VOC levels will be monitored within 20 feet of the nearest downwind residential or commercial structure. (20-foot zone)
3. Continue air monitoring 15-minute intervals in the 20- foot zone. If two successive readings below action levels are measured, air monitoring intervals may be halted or modified by the Owner's Representative, with approval of the NYSDEC and NYSDOH.
4. If the Total VOC levels persist above 5.0 PPM within the 20-foot zone, Con Edison/Owner's Representative will consult with the Emergency Response Agencies to determine appropriate actions to be implemented. Con Edison has the ultimate authority during major vapor emission emergencies

ARCADIS

Appendix F

Waste Management Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Consolidated Edison Company of New York, Inc.

Waste Management Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

September 2014

ARCADIS

Waste Management Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Manufactured Gas Plant
Bronx, New York

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017

Our Ref.:
B0043027.0005

Date:
September 2014

Table of Contents

1. Introduction

1.1 General

This Waste Management Plan (WMP) has been prepared to support the implementation of remedial activities at the Consolidated Edison Company of New York, Inc. (Con Edison) Krasdale Leasehold Property at Hunts Point Former Manufactured Gas Plant (MGP) site (site) located in Bronx, New York. This WMP describes the characterization, handling, treatment, and disposal requirements for various waste materials that are anticipated to be generated during the replacement of a storm sewer as described in the August 2014 Interim Remedial Measure Work Plan (ARCADIS, 2014).

The on-site management requirements for the anticipated waste streams to be generated during remedial construction activities are described in Section 2 of this WMP. Requirements for waste loading and off-site transportation are presented in Section 3. The references used to prepare this WMP are provided in Section 4.

Exhibit A provides a list of Con Edison's approved waste transportation and disposition vendors.

1.2 Applicable Codes, Standards, and Specifications

All waste management activities shall be conducted in accordance with all local, state and federal rules, laws and regulations, including:

- United States Environmental Protection Agency (USEPA), including Title 40, Code of Federal Regulations (CFR).
- Occupational Safety and Health Administration (OSHA), including Title 29 CFR, and Parts 1910 and 1926, OSHA, U.S. Department of Labor.
- State of New York Rules and Regulations, including Title 6 of the Official Compilation of Codes, Rules and Regulations (6 NYCRR) Parts 360, 364, 370, and 372 regarding treatment/disposal, transportation, and management of hazardous waste.
- New York State Department of Environmental Conservation (NYSDEC) Technical Administrative Guidance Memorandum (TAGM) 4061 – Management of Coal Tar

Wastes and Coal Tar Contaminated Soil and Sediment from Former Manufactured Gas Plants.

- Occupational Safety and Health Administration (OSHA) regulations contained in 29 CFR Part 1910.120 “Hazardous Waste Operations and Emergency Response”.
- Applicable guidelines of the New York State Department of Health (NYSDOH).
- Transportation regulations, including United States Department of Transportation (USDOT) regulations, including Title 29 Parts 171 and 172 and New York State Department of Transportation (NYSDOT) rules and regulations.
- Applicable federal, state, and local government regulations (including local flow control regulations).
- Con Edison waste management and recycling procedures for conducting work at company facilities.

Whenever there is a conflict or overlap of regulatory criteria, the most stringent provision shall apply.

2. Material Handling and Treatment/Disposal

2.1 General

Materials that are anticipated to be generated during the storm sewer replacement activities consist of:

- Excavated soil
- Controlled Low Strength Material (CLSM) spoils
- Construction and demolition debris (e.g., asphalt, concrete, storm sewer piping)
- Water (e.g., groundwater, stormwater that enters the storm sewer replacement trench, and decontamination water)
- Miscellaneous waste

The following subsections describe the material handling activities specific to each of the above-listed material type.

2.2 Excavated Soil

All excavated material shall be directly loaded into appropriate vehicles for off-site treatment and/or disposal. No excavated material shall be staged directly on the ground, or on plastic sheeting placed on the ground. All dewatering, stabilization, mixing, segregation, and/or downsizing of excavated materials shall be conducted within the limits of the excavation. Emission controls shall be employed, as necessary and to the satisfaction of the Oversight Engineer, during these activities. The Contractor may propose other structures, including means and methods, for conducting dewatering/stabilization of materials for review/approval by the Oversight Engineer. At a minimum, excavated soils must pass Paint Filter testing procedures prior to the transportation of such materials to the approved off-site treatment/disposal facility.

Contractor shall prepare and submit a waste profile to the approved treatment/disposal facility. Con Edison will review and approve waste profiles and draft manifests/bills of lading prior to off-site disposition of materials, and will sign waste manifests/bills of lading as the Generator. Documentation between the Contractor and the disposal

facility identifying the type of material to be disposed and indicating that the disposal facility will accept the waste material will be provided to NYSDEC prior to off-site disposal of material generated during the storm sewer replacement.

The Contractor shall appropriately containerize (including completely lining and covering bulk waste hauling vehicles), label, and transport the soils to the off-site treatment/disposal facility in accordance with applicable rules and regulations.

2.3 Debris

Debris generated during the remedial activities may include the former building foundations, former oil and tar separator materials of construction, brick, concrete, trees, stumps/root balls, and/or stone. Such materials will be segregated as appropriate from other excavated materials, downsized (as appropriate), and handled separately, where practicable. The Contractor shall mobilize debris crushing/downsizing equipment prior to initiating excavation activities to minimize potential work delays once/if materials requiring downsizing are encountered.

Debris will be stockpiled on-site by the Contractor within a fully lined roll-off container or direct loaded for off-site disposal at a Con Edison-approved facility. The Contractor will downsize (as required by the waste transportation and disposition vendors), appropriately containerize (i.e., completely line and cover waste hauling vehicles), label, and transport the debris to the off-site disposal facility consistent with the waste profile and in accordance with applicable rules and regulations (including local flow control regulations). The Contractor will be responsible for preparing all waste profiling and manifest forms. Con Edison will review and approve waste profiles and draft manifests/bills of lading prior to off-site disposition of materials, and will sign all waste manifests/bills of lading as the Generator.

2.4 Remediation-Related Water

Water generated during the remedial activities (i.e., remediation water) is anticipated to include surface water and groundwater that is extracted from and/or accumulated within the excavation areas, storm sewer, and equipment/personnel decontamination water. The Contractor shall collect, extract, and convey all remediation water to the water management system. Once properly characterized, remediation water will be transported off-site for treatment/ disposal at a Con Edison-approved facility. The Contractor will appropriately containerize, label, and transport the remediation water to the off-site treatment/disposal facility based on the waste profile and in accordance with

applicable rules and regulations. The Contractor will be responsible for scheduling and coordinating the off-site transportation of all remediation water. The Contractor will be responsible for preparing all waste profiling and manifest forms. Con Edison will review and approve waste profiles and draft manifests/bills of lading prior to off-site disposition of materials, and will sign all waste manifests/bills of lading as the Generator.

2.5 Miscellaneous Wastes

Miscellaneous wastes generated during the remedial activities may be classified as general refuse or remediation-related waste material. General refuse (that has not contacted any MGP-related waste materials) may be managed as a non-hazardous waste and disposed at a Con Edison-approved off-site non-hazardous solid waste disposal facility.

Remediation-related waste materials that are either in, or come in contact with, materials that contain MGP-related impacts during the remedial activities will be considered potentially impacted. These waste materials may include, but are not limited to, the following:

- Excess CLSM
- Ancillary wastes generated as a result of the remedial activities, including, but not limited to, materials used to construct the staging and decontamination areas
- Temporary erosion and sedimentation control measures (e.g., silt fencing, straw bales)
- Scrap geotextile
- Used disposable equipment
- Used personal protective equipment (PPE)
- Used sampling equipment

The miscellaneous wastes shall be containerized (e.g., in 55-gallon drums or roll-off container), stored on site, and characterized (as appropriate) by the Contractor. Following characterization, the Contractor will label, and arrange for the transportation and disposal of the collected and containerized miscellaneous waste based on the

characterization results and in accordance with applicable rules and regulations (including local flow control regulations). The Contactor, in consultation with Con Edison, shall determine if the miscellaneous waste can be transported/disposed under the existing waste profiles or if a new waste profile(s) is required. If a new waste profile(s) is required, the Contractor will be responsible for preparing new waste profiles and manifest forms. Con Edison will review, approve, and sign waste profiles and draft manifests/bills of lading prior to off-site disposition of materials as the Generator.

3. Waste Loading and Off-Site Transportation

3.1 General

This section presents minimum transporter requirements during loading and transportation of solid and liquid non-hazardous and hazardous wastes generated by the remedial activities at the site. In addition to the vehicle and driver requirements presented below.

3.2 Transporter Requirements

The use of the term “transporter” shall mean the transporter and the Contractor if/when the transporter is subcontracted to the Contractor.

The transporter shall provide all necessary supervision, labor, training, permits, hazardous waste manifests (when required), PPE, tools, equipment, materials, and all things incidental and necessary to transport solid and liquid waste from the site to the permitted disposal facilities.

The transporter shall comply with the following minimum requirements:

- Any truck found unacceptable by Con Edison (or the Oversight Engineer) will be rejected, and the cost for any rejected truck shall be incurred by the transporter. If NYSDEC on-site personnel find any trucks unacceptable, NYSDEC should notify Con Edison’s project manager who, in turn, shall notify the truck driver.

- The transporter shall adhere to the following rules while at the site, in transit from the site to the waste disposal facility, and at the waste disposal facility:

    - Prior to entry to the site, truck drivers shall stage trucks only in areas designated by Con Edison (or the Oversight Engineer). While staged, truck engines shall be shut off.

    - Truck drivers shall announce their arrival at the site to Con Edison (or the Oversight Engineer).

    - Truck drivers are generally restricted to the approved truck route (city-mapped truck routes; Exhibit B) and designated waiting areas. Drivers are not permitted access to the site without permission from Con Edison (or the Oversight

Engineer).Truck drivers must supply and wear HARD HATS, SAFETY GLASSES, SAFETY SHOES, and GLOVES, as a minimum, at all times when outside the truck cab for personal protection.

- Truck drivers shall line the entire waste transport container (dump truck box, dump trailer, roll-off waste container, etc.) that will be used to haul hazardous solid waste, conditionally exempt MGP site remediation waste, or non-hazardous waste (e.g., to top of the side boards) with 6-mil thick polyethylene sheeting. Certain waste transport containers used to haul construction and demolition (C&D) debris may also need to be lined as indicated above. All waste transport containers shall have a watertight tailgate with a gasket between the box and tailgate. If free liquids are observed leaking from the container of the truck once loaded, the truck cannot leave the loading area.

- All trucks shall be subject to inspection by the Oversight Engineer upon arrival at the site. If trucks are not clean (as determined by the Oversight Engineer), trucks will be rejected. Cleaning of trucks is not permitted at the site.

- All trucks shall be equipped with working audible and visual backup signals.

- When waste transport containers are being loaded, and when directed by Con Edison, the truck engine shall be shut off. The truck engine may be restarted and the truck driven away only after the “all clear” direction is provided to the driver by the loading equipment operator or by a site representative.

- No waste transport container shall be loaded above the sideboards and no waste shall be permitted to spill out of the waste transport container. Before trucks leave the loading areas, the exterior of the waste hauling portion of the vehicle and tires shall be cleaned (by the Contractor’s site workers) to remove any residual waste.

- The Contractor’s site workers shall reposition the cover bars over the waste material. DRIVERS SHALL NOT WALK OVER WASTE MATERIAL.

- Drivers shall cover loads before leaving the loading area with a solid fabric (i.e., vinyl, reinforced polyethylene) that extends over the entire load and is secured to resist wind forces at highway speeds.

- Drivers shall obey all traffic signs and notices (obey the posted speed limit) and comply with weight restrictions.

- Drivers shall obey rules posted on the site and contained in any of the site-specific HASPs used at the site by the Contractor and the Oversight Engineer.

- Drivers shall report any accidents to the Con Edison project manager and cooperate with any subsequent accident investigation.

- No children under 16 years of age shall be allowed at the site.

- No passengers are allowed in the Contamination Reduction Zone (i.e., loading area).

- Drivers shall slow down and use extra caution during inclement weather (i.e., rain, fog, snow).

- Drivers shall use extra caution around blind corners (watch for pedestrians and construction equipment).

- Smoking, eating, and/or drinking is not permitted within the work area.

- After disposal of waste, the transporter shall be responsible for properly decontaminating the waste hauling portion of the vehicle.

3.3 Truck Route

The transporter shall follow NYSDOT approved Local and Through Truck Route Network (truck transport route map; Exhibit B) while accessing the site and transporting the waste from the site to the off-site disposal facility.

- For trucks travelling from the south, the recommended local truck route to the site is Leggett Avenue. For trucks travelling from the north, the recommended truck route to the site is Tiffany Street.

- Truck drivers must limit transport through residential areas and sensitive receptors.

- Route 278 is the closest highway from the site. Truck drivers must limit the distance to local highways.

- Truck drivers must always have on hand a bill of lading, or similar document, showing the points of origin and destination of the trip.

- Contractor must prohibit off-site queuing of trucks entering the site and truck drivers shall stage trucks only in areas designated by Con Edison (or the Oversight Engineer).

- Only one truck loading or off-loading will be permitted on the site at one time unless authorized in writing by the Oversight Engineer and the NYSDEC.

4. References

ARCADIS. 2014. Interim Remedial Measure Work Plan, Hunts Point Former MGP Site, prepared for the Consolidated Edison Company of New York, Inc. August 2014.

NYSDEC. 2002. Technical and Administrative Guidance Memorandum (TAGM) 4061, Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants. Published January 11, 2002.

ARCADIS

Exhibits

ARCADIS

Exhibit A

Con Edison-Approved Waste
Disposal and Recycling Facilities

HAZARDOUS WASTE MANAGEMENT/RECYCLING FACILITIES

	Facility	Address	City	State	Zip	
1	American Lamp Recycling, Inc	26 Industrial Way	Wappingers Falls	NY		Closed
2	Astoria PCB Shed	30-01 20th Avenue	Astoria	NY	11105	
3	Astoria Waste Treatment Plant	30-01 20th Avenue	Astoria	NY	11105	
4	Bethlehem Apparatus	890 Front St.	Hellertown	PA	18055	
	Bethlehem Apparatus	935 Bethlehem Dr.	Bethlehem	PA	18017	
5	Tradebee Treatment and Recycling of Bridgeport, former Bridgeport United Recycling	50 Cross Street	Bridgeport	CT	06610	
6	Chemical Waste Management	36964 Highway 17	Emelle	AL	35459	
7	Chemical Waste Management	1550 Balmer Road	Model City	NY	14107	
8	Clean Earth of NJ (formerly know as S&W Cycle Chem	115 Jacobus Ave.	Kearny	NJ	07032	
9	Clean Harbor of Connecticut	761 Middle St.	Bristol	CT	06010	
10	Clean Harbors Aragonite, LLC formerly Sk	11600 North Aptus Road	Aragonite	UT	84029	
11	Clean Harbors Env. Services	2247 S. Highway 71	Kimball	NE	69145	
12	Clean Harbors Env. Services		Chicago	IL		Mothballed/Suspended Operations
13	Clean Harbors Env. Services former SK	1672 Highland Road	Twinsburgh	OH	44087	
14	Clean Harbors LLC,	Highway 169 North	Coffeyville	KS	67337	
15	Clean Harbors of Baltimore, Inc	1910 Russell Street	Baltimore	MD	21230	
16	Clean Harbors of Braintree, Inc.	One Hill Ave.	Braintree	MA	02184	
17	Clean Harbors PPM, former Safety Kleen	1875 Forge St.	Tucker	GA	30084	
18	Clean Harbors PPM, former Rollins		Bridgeport	NJ		Closed

	Facility	Address	City	State	Zip	
19	Clean Harbors, former Laidlaw		San Antonio	TX		Mothballed/Suspended Operations
20	Clean Harbors, former Safety Kleen		Ashtabula	OH		Closed
21	Clean Harbors, former Safety Kleen	2027 Battleground Road	Deer Park	TX	77536	
22	Clean Harbors, former Safety Kleen, PPM		Philadelphia	PA		Closed
23	Clean Harbors, former Spring Grove Res.	4879 Spring Grove Ave.	Cincinatti	OH	45232	
24	Cycle Chem	217 South First Street	Elizabeth	NJ	07206	
25	E.I. Dupont		Deepwater	NJ		Closed
26	Environmental Protection Services (EPS)	4 Industrial Park Dr.	Wheeling	WV	26003	
27	Exide Technology Inc.	P.O. Box 14294	Reading	PA	19612	Closing
28	G & S Technologies	1800 Harrison Ave.	Kearny	NJ	07032	
29	Keystone Cement Company	Route 329	Bath	PA	18014	
30	Mercury Refining Company, Inc		Albany	NY		Closed
31	Mercury Waste Solutions, Inc	212 Durand Ave.	Union Grove	WI	53182	
32	NSSI		Houston	TX		
33	Veolia, (formerly ONYX)	Highway 73	Port Arthur	TX	77640	
34	Phillips Serv. Corp. (Republic Env. Service)	2869 Sandstone Dr.	Harfield	PA	19440	
35	Pure Earth, former Casie Protank/Mid Atlantic Technologies	3209 N. Mill Road	Vineland	NJ		Closed
36	Revere Smelting& Refining, Inc.	65 BALLARD ROAD	Middletown	NY	10941	
37	Safety Kleen Corporation	1200 Sylvan Street	Linden	NJ	07036	
38	Safety Kleen Corporation	1722 Cooper Creek Road	Denton	TX	76208	
39	Veolia (formerly Salesco)	5735 West Jefferson St.	Phoenix	AZ	85043	
40	Clean Harbors (formerly ENSCO)	310 American Road	El Dorado	AR	71730	
41	The EQ Company-Wayne landfill/Mich. WDT	49350 North I-94	Wayne/Belleville	310	45111	
42	Trans-Cycle Industries	101 Parkway East	Pell City	AL	35125	
43	Triumvirate Env. (former Chem. Waste Mgmt)	42-14 19th Avenue	Astoria	NY	11105	
44	Veolia Env. Services former AETS (ONYX)	1 Eden Lane	Flanders	NJ	07836	

NON HAZARDOUS WASTE MANAGEMENT FACILITIES

	Facility	Address	City	State	Zip	Waste Type	
1	AB Oil		Bohemia			Used Oil	
2	Covanta, former American Ref-Fuel Co of Hempstead	600 Merchants Concourse	Westbury	NY	11590	Industrial and commercial wastes	
3	Covanta (formerly American Ref-Fuel)	100 Energy Blvd.	Niagara Falls	NY	14304	MGP wastes (non-haz), industrial	
4	Astoria WWTP	30-01 20th Avenue	Astoria	NY	11105	< 50 PPM Mostly Water	
5	Bayshore Soil Mgmt, former ESMI of NJ	75 Crows Mill Road	Keasbey	NJ	08832	MGP waste, petroleum contaminated soils	
6	Republic Waste - Conestoga	420 Quarry Road	Morgantown	PA	19543	Industrial	
7	Tradebee Treatment and Recycling of Bridgeport, former Bridgeport United Recycling	50 Cross Street	Bridgeport	CT	06610	>2 & <550 PPM Oil	
8	Casings, Inc.	Highway 9 West	Catskill	NY	12412	Tires	
9	Clean Earth Dredging Technologies (CEDTI)		Jersey City			Dredged material	
10	Clean Earth of Maryland	1469 Oak Ridge Place	Hagerstown	MD	21740	Industrial	
11	Clean Earth of NJ, formerly S&W	115 Jacous Ave.	Kearny	NJ	07032	Industrial & Haz	
12	Clean Earth of Philadelphia	3201 S. 61st Street	Philadelphia	PA	19153	Petroleum Contaminated soils including MGP wastes	
13	Clean Earth of Southeast Philadelphia	7 Steel Road East	Morrisville, PA	PA	19067	Petroleum Contaminated soils including MGP wastes	
	Clean Earth of Delaware	94 Pyles Lane	New Castle	DE	19720	Petroleum Contaminated soils including MGP wastes	
14	Clean Harbors - Rummery Road	37 Rumery Road	S. Portland	ME	04106	Waste/used Oil/wastewater (non-haz)	
15	Clean Harbors of Baltimore	1910 Russell Street	Baltimore	MD	21230	Oil/Oily Water < 2PPM	
16	Clean Harbors of Connecticut	761 Middle St.	Bristol	CT	06010	Used Oil	
17	Clean Water	3249 Richmond Terrace	SI	NY	10303	<2 PPM Oil/Water	
18	Con Edison	30-01 20th Avenue	Astoria	NY	11105	Industrial - solids	
19	Covanta Huntington, Inc	99 Town Line Road	E. Northport, LI	NY	11731	Industrial wastes-supplemental fuel	
20	Deep Green of NY former TPS Technologies	1106 River Road	New Windsor	NY	12553	Nonhazardous pet. Contaminated/ MGP soils on a case by case basis	
21	E.I. Dupont		Deepwater			<2 PPM Oil/Water	Closed
22	Environmental Soil Management (ESMI)	304 Towpath Road	Fort Edwards	NY	12828	MGP waste - pet. & non-petroleum wastes	
23	General Electric, Inc	405 School Road	East Hartford	CT	06108	Spent resins	
24	General Electric, Inc	4545 Patent Road	Norfolk	VA	23502	Spent resins	
25	WMI High Acres	425 Perintwon Parkway	Fairport	NY	14450		
26	Inmetco	843 Miller Picking Road	245 Portersville RD			Universal Waste & non-univers, batteries	
27	International Petroleum	505 South Market St.	Wilmington	DE	19801	< 2 PPM Oil/Water	
28	National Refrigerants, Inc.	661 Kenyon Ave.	Rosenhayn	NJ	08352	Used Refrigerants	
29	New CEI Inc. formerly Clean Earth, Inc		Philadelphia			Nonhazardous pet. Contaminated/ MGP soils	

	Facility	Address	City	State	Zip	Waste Type	
30	Norlite LLC, former Norlite	628 South Saratoga St.	Cohoes	NY	12047	< 2 < 25 PPM Oil	
31	Paradise Oil	Quimby Street	Ossining			Oil/Oily Water < 2PPM	
32	PASCAP	4250 Boston Road	Bronx	NY	10475	Ferrous and non-ferrous material	
33	Recycle Inc. East	20 A Harmich Road	South Plainfield	NY	10562	Steel, poly, fiber, composite, AL&C drums	
34	Siemens Water Technologies	88 Nutmeg Road South	South Windsor	CT	06074	Spent resins	
35	Siemens Water Technologies	95 Lower Morrisville Road	Fallsington	PA	19054	Spent resins	
36	The Environmental Quality (EQ)	49350 North I-95	Belleville	MI	48111	Industrial & Haz	
37	Tilcon, former Mt. Hope (closed)		Wharton			Industrial	Closed
38	Trans-Clean Corp	45 Mayfair Place	Stratford	CT	06615	Car Washing wastewater	
39	Tradebe Treatment and Recycling Northeast LLC, former United Oil Recovery of Meridan	136 Gracey Ave.	Meriden	CT	12047	Used oil/oily water	
40	Waste Management - GROWS	1400 Bordentown Road	Morrisville	PA	19067	Industrial - asbestos	
41	Waste Management	200 Bordentown Road	Tullytown	PA	19067	Industrial - asbestos	
42	Waste Management - High Acres	425 Perinton Parkway	Fairport	NY	14450	Non hazardous MGP waste/non PCB/pet. Hydr/asbestos	

C & D / STREET EXCAVATION WASTE MANAGEMENT / RECYCLING FACILITIES

	Facility	Address	City	State	Zip	
1	110 Sand Company Landfill	136 Bethpage/Spagnoli Road	Melville	NY	11747	
2	Alloco Recycling Corp.	540 Kingsland Avenue	Brooklyn	NY	11222	
3	Bria Carting Corp. /Somers Sanitation	241 Route 100	Somers	NY	10589	
4	NY Recycling LLC former Bronx County Recycling	475 Exterior Street	Bronx	NY	10451	
5	Cineli Iron & Metal Corp.	109 McKinley Street	Hackensack	NJ	07601	
6	Tilcon former Con Agg Recycling	980 East 149 Street	Bronx	NY	10455	
7	Dublin Scrap Metal Corp.	489 Frelinghuysen Avenue	Newark	NJ	07114	
8	Durante Brothers	31-40 123rd Street	Queens	NY	11354	
9	Evergreen Recycling	Willets Point Blvd	Corona	NY	11368	
10	Filco Carting Corp.	111 Gardner Avenue	Brooklyn	NY	11237	
11	Gershow Recycling Center	71 Peconic Avenue	Medford	NY	11763	
12	Jamaica Recycler	9429 165th Street	Jamaica - (Q)	NY	11432	
13	Justus Recycler	3300 Provost Avenue	Bronx	NY	10466	
14	Maspeth Recycler	58-08 48th Street	Maspeth	NY	11378	
15	National Refrigerants, Inc.	661 Kenyon Ave.	Rosenhayn	NJ	08352	
16	New York Paving	37-18 Railroad Ave	Long Island City	NY	11101	
17	Pallets -R - Us	1150 Motor Pkwy	Wyandanch, LI	NY	11722	
18	Peckham Material Corp.	Route 117 By-pass	Bedford Hills	NY	10507	
19	Peckham Material Corp.	1 Purdy Avenue	Portchester	NY	10573	
20	Per Scholas	1575 Bronx River Avenue	Bronx	NY	10460	
21	Raines & Welsh & Sons Contractors, Inc.	102 E. Railroad Avenue	West Haverstraw	NY	10984	
22	South Island industries, inc.	2 Rason Rd	Inwood	NY	11096	
23	Tri-State Transfer Associates, Inc.	1199 Randall Avenue	Bronx	NY	10474	
24	Vanbro Corporation	1900 South Avenue	Staten Island	NY	10314	
25	Waste Management of Yonkers	325 Yonkers Avenue	Yonkers	NY	10701	
26	Waste Mgmt.	123 Varick Avenue	Brooklyn	NY	11237	
27	Waste Mgmt. of LI		New York	NY		Closed

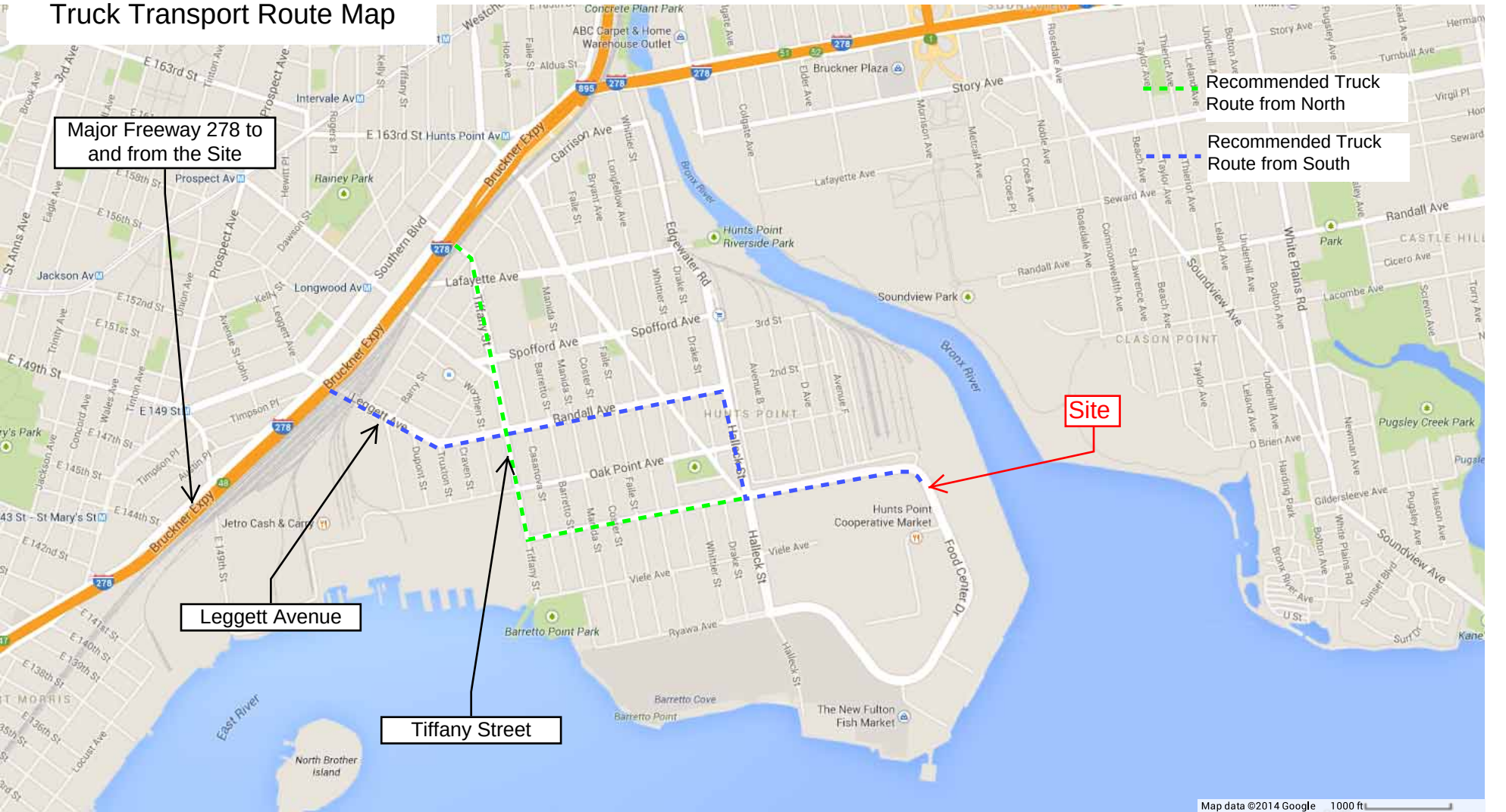
ASBESTOS LANDFILLS

	Facility	Address	City	State	Zip	
1	110 Sand Company Landfill	136 Bethpage/Spagnoli Road	Melville	NY	11747	
2	Chem Nuclear System		Barnwell	SC		mothballed
3	Chemical Waste Mgmt.	1550 Balmer Road	Model City	NY	14107	
4	Envirocare of Utah Inc.	Highway 80	Clive	UT	84029	
5	GTS Duratek Inc.		Oak Ridge	TN		mothballed
6	WMI High Acres	425 Perinton Parkway	Fairport	NY	14450	
7	WMI Kelly Run Landfill	1500 Hayden Blvd.	Elizabeth	PA	15037	
8	WMI Meadowfill	RT 2 Box 68	Bridgeport	WV	26330	
9	Minerva Enterprises	9000 Minerva Road	Waynesburg	OH	44688	
10	WMI Southern Alleghenies	843 Miller Picking Road	Davidsville	PA	15928	
11	The EQ Company-Wayne landfill/Mich. WDT	49350 North I-94	Wayne/Belleville	MI	45111	
12	Waste Management - GROWS	1400 Bordentown Road	Morrisville	PA	19067	
13	Waste Management - Tullytown	200 Bordentown Road	Tullytown	PA	19067	
14	Chemical Waste Management	36964 Highway 17	Emelle	AL	35459	
15	Chemical Waste Management	1550 Balmer Road	Model City	NY	14107	

EXHIBIT B

Truck Transport Route Map

Truck Transport Route Map



Additional Truck and Commercial Vehicle Resources

New York City Resources

NYCDOT Truck and Commercial Vehicle Information
www.nyc.gov/trucks

NYCDOT Truck Permit Unit 212-839-6341

Commercial Motor Vehicle Tax (CMVT)
www.nyc.gov/finance 212-361-1210

NYCDOT Office of Freight Mobility 212-839-6670

NYSDOT Long Island
(in Nassau and Suffolk Counties) 631-952-6022

State and Regional Information and Resources

NYSDOT Truck Information
www.nysdot.gov/portal/page/portal/modal/truck

New York State Permitting
www.nypermits.org

New York State –
One Stop Credentialing and Registration (OSCAR)
www.oscar.state.ny.us/OSCR/OSCRCarrierHome

Port Authority of New York and New Jersey
www.panynj.gov 212-435-7000/1-800-221-9903

MTA Bridges and Tunnels
www.mtainfo/bandt

Need more info or maps?
Call **311** or
(212) NEW-YORK
from outside NYC

Or Visit **www.nyc.gov/trucks**

NYC 311 your city, your needs, your number.

2011-2012 New York City Truck Route Map

Five Boroughs, One Map.

Free
Updated 2011

Typical Truck Route Signs

These signs are used to indicate the Truck Route System. They are posted at intersecting truck routes and along the routes themselves.

Negative signs, as depicted above, restrict trucks only to local deliveries. However, as per Section 4-13 of the Traffic Rules, all trucks must utilize the intersection closest to their destination in order to access a destination. Signage is not required to be posted to enforce the truck route regulations.

All commercial vehicles and trucks are prohibited from utilizing the Parkway system in New York City. These signs are posted on roadways and parkways which restrict travel by these types of vehicles.

Lower Manhattan & Downtown Brooklyn

Trans-Manhattan Expressway George Washington Bridge

Greenpoint, Brooklyn

Long Island City/Hunters Point, Queens

Lincoln Tunnel, Manhattan

Trucks Traveling Westbound to New Jersey:
Use W 40 St or W 41 St to enter Lincoln Tunnel

East Williamsburg, Brooklyn

LIMITED TRUCK ZONES

- Zone A - Chelsea
- Zone B - Chinatown
- Zone C - Greenwich Village
- Zone D - Little Italy
- Zone E - Lower East Side
- Garment District

No operator of a truck shall operate, enter, stop, stand or park his/her vehicle upon any of the streets designated within these Limited Truck Zones except for the purpose of making a delivery, loading or servicing within said zone and traveling on the respective routes as designated in Sections 4-13 (d)(13) and 4-13 (d)(18) of the NYC Traffic Rules.

- Financial District
- Midtown Core

No operator of a vehicle having an overall length of 35 feet or more shall enter his/her vehicle upon any of the streets as listed within these Limited Truck Zones as designated in Section 4-13 (d)(18) of the NYC Traffic Rules.

IMPORTANT ADVISORY

Please be advised that commercial vehicles cannot travel on most Parkways.

All trucks must travel on designated Local and Through Truck Routes to the intersection nearest their destination. All posted restrictions must be obeyed.

LEGEND

- Local Truck Routes
- Limited Local Truck Routes
- Through Truck Routes
- Through Truck Routes on Expressway
- COMMERCIAL VEHICLES PROHIBITED on Parkways and Other Highways
- Principal Streets
- Parks
- Open Space or Cemeteries
- Industrial or Institutional Areas
- Airports
- Interstate Route
- Interstate and Highway Exits
- MTA Bridges and Tunnels
- Port Authority of NY & NJ
- Transportation Facilty Operator*

* Truck restrictions vary by facility. For more information, refer to the Resource section of this map.

Hunts Point, Bronx

Port Morris, Bronx

College Point, Queens

Trucks Traveling Southbound to College Point from Bronx-Whitestone Bridge: Use 20th Avenue

Astoria, Queens

N

0 1/2 1 MILES
0 1 2 KILOMETERS

Staten Island Inset

INFORMATION FOR OVERWEIGHT/OVERDIMENSIONAL PERMITS

Each of the transportation providers in New York City has special requirements regarding the movement of Oversized or Overweight Vehicles over their facilities. These include the New York City Department of Transportation, the MTA Bridges and Tunnels, and the Port Authority of New York and New Jersey.

Within New York City Overdimensional Permits are issued by:

DOT-Bridges Truck Unit
55 Water Street,
New York NY 10041
Tel: (212) 839-6341

LEGEND

- Local Truck Routes
- Limited Local Truck Routes
- Through Truck Routes
- Through Truck Routes on Expressway
- Parkways (NO COMMERCIAL VEHICLES)
- Principal Streets
- MTA Bridges and Tunnels / Port Authority of NY & NJ — Transportation Facility Operator*
- Parks
- Open Space or Cemeteries
- Industrial or Institutional Areas
- Airports
- 278 Interstate Route
- 1 Interstate and Highway Exits

0 1/2 1 MILES
0 1 2 KILOMETERS

* Truck restrictions vary by facility. For more information, refer to the Resource section of this map.

This map is to be used for reference purposes only. Please refer to the New York City Traffic Rules for the most current traffic regulations governing truck routes as well as permissible truck weights and dimensions. Information on this map is subject to change without notice. Always observe all posted restrictions as limitations may apply to designated truck routes.

Revised by NYCDOT, February 2010

UNLOADING TRUCKS NEAR CURBSIDE BIKE PATHS

See a mistake? Please help us make the next edition of this map more accurate. Inform the New York City Department of Transportation about any inaccuracies or omissions you may notice by emailing truckroute@dot.nyc.gov or calling 212-839-6670.

IMPORTANT ADVISORY

Please be advised that commercial vehicles cannot travel on most Parkways.

All trucks must travel on designated Local and Through Truck Routes to the intersection nearest their destination. All posted restrictions must be obeyed.

TRUCK RELATED VIOLATIONS CODES AND DEFINITIONS

Truck Route Definitions

TRUCK

Pursuant to 34 RCNY §4-13, a truck is defined as any vehicle or combination of vehicles designed for the transportation of property, which has either of the following characteristics: two axles, six tires; or three or more axles.

LOCAL TRUCK ROUTE

Trucks with an origin or destination for the purpose of delivery, loading or servicing within the respective Borough, shall only operate on designated local routes, except that an operator may operate on a non-designated street for the purpose of arriving at his/her destination. This shall be accomplished by leaving a designated truck route at the intersection that is nearest to their destination, proceeding by the most direct route, and then returning to the nearest designated truck route by the most direct route. If the operator has additional destinations in the same general area, he/she may proceed by the most direct route to his/her next destination without returning to a designated truck route, provided that the operator's next destination does not require that he/she cross a designated truck route.

THROUGH TRUCK ROUTE

Trucks having neither an origin nor a destination within the respective Borough shall restrict the operation of such vehicles to those street segments designated as Through Truck Routes.

LIMITED LOCAL TRUCK ROUTE

Some of the roadways in Staten Island are designated as Limited Local Truck Routes. These roadways serve as Local Truck Routes but are limited to trucks with two axles and six tires.

Off-Truck Route Violations

New York City Truck Routes are designated in Section 4-13 of the New York City Traffic Rules.

Queens	4-13(b)
Staten Island	4-13(c)
Manhattan	4-13(d)
Brooklyn	4-13(e)
Bronx	4-13(f)

INFORMATION CONCERNING OVERSIZED/OVERWEIGHT VEHICLES

Maximum Dimensions of Vehicles and Combinations in New York City

Width: 96 inches (for school buses and fire vehicles, 98 inches, buses having a carrying capacity of more than seven passengers shall not exceed 102 inches). [34 RCNY §4-15(b)(1)]

Height: 13 1/2 feet. [34 RCNY §4-15(b)(2)]

Length: Articulated buses - 65 feet. [34 RCNY §4-15(b)(3)]
Semi-trailer - 55 feet. [34 RCNY §4-15(b)(4)]
Single vehicles (except articulated buses and semi-trailers) - 35 feet. [34 RCNY §4-15(b)(3)]

The New York City interstate routes approved for 53 foot trailers are: I-95 between the Bronx-Westchester County line and I-295, and I-295 to I-495 via the Throgs Neck Bridge and I-495 between I-295 and the Queens-Nassau County line.

On I-95 between I-287 and I-295, on I-295 between I-295 and I-495, and on I-495 between I-95 and the Nassau-Queens county line, a semi-trailer over 48 feet (but not over 53 feet) may be operated if the distance between the kingpin of the semi-trailer and the centerline of the rear axle or rear axle group does not exceed 43 feet, and if the semi-trailer is equipped with a rear-end protective device of substantial construction consisting of a continuous lateral beam extending to within 4 inches of the lateral extremities of the semi-trailer and located not more than 22 inches from the surface as measured with the vehicle empty and on a level surface. [NY Vehicle and Traffic Law §385(3)(e)]

In double bottom operation, a semi-trailer or trailer may not exceed 28 1/2 feet. [NY Vehicle and Traffic Law §385(3)(b)]

Combination of Vehicles - 55 feet except that on qualifying highways and access highways there is no limit on length. [34 RCNY §4-15(b)(4), NY Vehicle and Traffic Law §385(4)(b)(1)]

NOTE: The provisions of Section 4-15 shall not apply to any vehicle authorized by the Federal Surface Transportation Assistance Act of 1982, as amended, when such vehicle is operating pursuant to the provisions of such Act.

Permissible Gross Weight of Vehicles And Combinations With Pneumatic Tires

Weight per inch width of tire on one wheel - 800 pounds. [34 RCNY §4-15(b)(6)]

Weight on any one wheel - 11,200 pounds. [34 RCNY §4-15(b)(7)]

Weight on any one axle - 22,400 pounds. [34 RCNY §4-15(b)(8)]

Weight on any two consecutive axles less than 10 feet apart - 36,000 pounds. [34 RCNY §4-15(b)(9)]

Weight on any three axles (34,000 lb. Plus 1,000 lb. Per foot and major fraction of a foot between first and last axles, (center to center). However, total weight should not exceed 80,000 lb. [34 RCNY §4-15(b)(10)]

Weight And Height Restrictions On Bridges, Viaducts And Other Structures

No vehicle or combination of vehicles may be operated over, on or through any bridge, viaduct or other structures on any highway if the weight of such vehicle or combination of vehicles and load is greater than the posted capacity of the structure or exceeds the height of the posted clearance as shown by an official sign or other marking or device. [34 RCNY §4-15(b)(13)]

Printed on 50% recycled paper.

ARCADIS

Appendix G

2013 Pre-Design Investigation Report

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

June 28, 2013

Mr. Ronnie Lee, PE
NYSDEC
Division of Environmental Remediation
Remedial Bureau B
625 Broadway
Albany, New York 12233-7017

Subject:
Pre-Design Investigation Report
Krasdale Foods, Inc. Property
Former Hunts Point MGP
Bronx, New York
NYSDEC Site #V00554

Dear Mr. Lee:

This letter report summarizes the activities conducted and results obtained for a pre-design investigation (PDI) conducted within Operable Unit-2 (OU-2) at the Krasdale Foods, Inc. property (Krasdale property) at the Hunts Point former manufactured gas plant (MGP) site (the site). The PDI was conducted in support of designing the rehabilitation/replacement for a storm sewer pipe (i.e., the Dry Weather Discharge Pipe) located on the northern portion of the Krasdale property.

In addition to summarizing the PDI activities, this report also presents a conceptual design for the rehabilitation/replacement of the storm sewer pipe consistent with the *Dry Weather Discharge Evaluation Work Plan* (ARCADIS January 2011[revised August 2012]), which evaluated the alternatives and presented a recommended approach to prevent discharge of MGP-impacted water from the storm sewer pipe into the adjacent Bronx River. Based on correspondence with the New York State Department of Environmental Conservation (NYSDEC) during the preparation of the Dry Weather Discharge Evaluation Work Plan, NYSDEC noted a preference for proposed remedy Remedial Measure #3 – Full Subject Storm Sewer Replacement in the Same Alignment. As part of this remedy, material would be excavated to a depth sufficient to remove the existing pipe, associated catch basins, and soils to facilitate placement of bedding material and a new pipe. The NYSDEC indicated that no additional excavation of purifier waste below the water table may be required provided the groundwater near the pipe was shown not to be significantly impacted by the purifier waste, and the remaining purifier waste was covered with a layer of controlled low-strength material (CLSM) and clean fill. Therefore, an additional objective of the PDI activities was to evaluate whether purifier waste that may remain beneath the storm sewer pipe following the implementation of the pipe rehabilitation/replacement activities would serve as a significant source to groundwater impacts.

The PDI activities described in this letter were conducted to support the further development of a conceptual storm sewer pipe rehabilitation/replacement, which is presented as a conclusion to this letter report.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Background

The Krasdale property is located at 400 Food Center Drive, Bronx, New York. The storm sewer pipe is located along the northern boundary of the Krasdale property, as shown on Figures 2 and 3. The storm sewer is approximately 420 feet along and includes four catch basins (Inlet #113, #112, #111, and #120) along its length, which drain surface run-off from the asphalt parking area (catch shed of approximately 1.9 acres). The storm sewer is constructed of a combination of vitrified clay pipe and reinforced concrete pipe. The diameter of the pipe ranges from approximately 12 to 16 inches. The storm sewer drains at outfall OF-1 into the Bronx River. The depth of the pipe ranges from approximately 3 to 7 feet below grade and is generally at or just below the water table.

PDI activities consisted of the following:

- Completing soil borings in the vicinity of OU-2 to characterize subsurface materials along the storm sewer pipeline.

- Installing monitoring wells and collecting groundwater samples to evaluate groundwater conditions near the storm sewer pipeline.

- Collecting surface water samples from the storm sewer to evaluate dry-weather discharge characteristics.

- Completing geotechnical borings to evaluate soil conditions in support of completing the storm sewer pipe rehabilitation/replacement design.

- Conducting a compatibility evaluation between materials that may be used during the pipe rehabilitation/replacement (i.e., pipe materials and CLSM) and the current subsurface conditions (i.e., low pH).

PDI activities were conducted during June 2012 and were completed in accordance with the following NYSDEC-approved documents:

- *Off-Site Characterization Work Plan* (ARCADIS, November 2010)

  Site Characterization Work Plan – Krasdale Foods Inc., Leasehold (ARCADIS, February 2011) (SC Work Plan)

- *Pre-Design Investigation Work Plan* – Krasdale Foods Inc., Leasehold (Consolidated Edison Company of New York, September 2011) (PDI Work Plan)

- *Dry Weather Discharge Evaluation Work Plan* (ARCADIS January 2011[revised August 2012])

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

- Supporting documents consisting of *Field Sampling Plan* (FSP), *Quality Assurance Project Plan* (QAPP), *Health and Safety Plan* (HASP), and *Community Air Monitoring Plan* (CAMP) included as appendices to the above documents

The following sections present descriptions of the PDI activities, PDI results, and a conceptual design for the proposed storm sewer rehabilitation/replacement.

PDI Field Activities

For the purposes of this letter report, the PDI activities are organized under the following tasks:

- PDI Task 1 – Soil Investigation
- PDI Task 2 – Groundwater Investigation
- PDI Task 3 – Storm Sewer Water Investigation
- PDI Task 4 – Geotechnical Investigation

Deviations from the PDI Work Plan and supporting plans were communicated to Con Edison's Project Manager and the NYSDEC's Project Manager for the site, and were documented in the field notes. Summaries of the investigation activities conducted under these PDI tasks are presented in the following subsections.

PDI Task 1 – Soil Investigation

Prior to conducting any invasive activities, an on-site meeting was conducted with Con Edison and ARCADIS to mark-out the proposed PDI sampling locations to minimize disruption to site operations and identify the locations to be cleared by the utility locator. ARCADIS' utility locating subcontractor Naeva Geophysics, Inc. and Hager-Richter Geoscience, Inc. cleared each boring locations using magnetometers and ground-penetrating radar.

Between June 11 and 25, 2012, ARCADIS' drilling subcontractor (NYEG Drilling, LLC [NYEG]) installed a total of 11 soil borings (SB-01 through SB-10, and SB-16) by initially hand clearing (using a hand auger) to a depth of approximately 5 feet below grade and then completing the borings using direct push technology. Each soil boring was advanced to a confining layer, determined to be either a clay/silt, or refusal. SB-16 was installed as a contingency boring to delineate potential impacts from Parcel D due to surface tar boils observed near soil boring SB-09. Soil boring logs are presented in Appendix A and soil boring locations are shown on Figure 2.

Soil samples were collected continuously from each boring using 5-foot long, 2-inch diameter Macro-Core® tubes with Lexan liners. An ARCADIS geologist photographed, visually characterized, and screened each soil sample in the field for volatile organic compounds (VOCs) using a photoionization detector (PID). Upon completion, the soil borings were tremie-grouted to grade using a cement/bentonite grout if visual impacts were observed or backfilled with soil cuttings if no visual impacts were observed.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Consistent with the protocols presented in the SC Work Plan, soil samples were selected for laboratory analysis based on the following rationale:

- A sample was collected where observations of purifier wastes, non-aqueous phase liquids (NAPLs), other visual impacts, or elevated PID readings were observed.

- An additional sample was collected from a 1-foot interval below the observed impacted zone (if an impact was observed), at or near the base of the boring, or above the confining unit to define the vertical extent of impacts.

- Where no NAPL, purifier waste, other visual impacts, or elevated PID readings were observed, a sample was collected from the 1-foot interval directly above the water table.

Based on the criteria above, 25 soil samples collected from 11 soil borings were submitted to TestAmerica Laboratories (TestAmerica) for the following analyses:

- Target Compound List (TCL) VOCs (United States Environmental Protection Agency [USEPA] SW-846 Method 8260)

- TCL semivolatile organic compounds (SVOCs) (USEPA SW-846 Method 8270)

- Target Analyte List (TAL) metals (USEPA SW-846 Methods 6010/7470/7471)

- Cyanide, total and free (USEPA SW-846 Methods 9010/9016)

- PCBs (USEPA Method 8082)

- pH (USEPA SW-846 Method 9040B).

Additionally, select samples were submitted for the following additional analyses to support the bench scale evaluation of material (piping and/or grout material) compatibility (PDI Task 5) and establish baseline geochemical characteristics.

- Total petroleum hydrocarbons (TPH) (USEPA SW-846 Method 8015B)

- Inorganics, including ammonia, nitrate, nitrite, sulfate, sulfide, chloride, phosphate, fluoride and carbonate/bicarbonate (Methods SW-846 9056, SM4500S2-E, SM4500P-E, and SM-2320B)

Amenable cyanide was not analyzed as proposed in the SC Work Plan due to a shortage of reagent at the time of sampling. Additionally, two soil samples were not analyzed for pH due to limited sample volume.

Table 1 presents a PDI sample analyses summary.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

PDI Task 2 – Groundwater Investigation

NYEG installed four monitoring wells (MW-K1 through MW-K3, and MW-K6) during the site characterization activities conducted in June 2012. The PDI Work Plan specified the locations of monitoring wells MW-K1, MW-K2, and MW-K3 to evaluate groundwater quality along the storm sewer pipe. Monitoring well MW-K6 was installed west of the storm sewer pipe, in an area where saturated coal tar and tar boils were observed. Monitoring well completion logs are presented in Appendix A and monitoring well locations are shown on Figure 2.

Each monitoring well was installed and constructed to the following specifications:

- Wells were constructed with 2-inch inner diameter, threaded, flush-joint, Schedule 40 polyvinyl chloride (PVC) casing and screen.
- Screen lengths were between 9 and 16 feet with 20-slot (0.02 inch) openings.
- The annulus around the screens was backfilled with Morie No. 2 clean silica sand to a height of approximately 2 feet above the top of the screen.
- A bentonite seal with a minimum thickness of 1 foot was placed above the sand pack. The bentonite seal (chips) was allowed to hydrate before placement of grout above the seal.
- The remainder of the annular space was filled with a cement-bentonite grout to near the ground surface. The grout was pumped from the bottom up, and was allowed to set for a minimum of 24 hours prior to developing the well.
- Each monitoring well was closed with a sealed cap (J-plug) and was contained in a flush-mounted vault secured in an approximately 1 foot thick concrete pad. The concrete pad was sloped slightly to channel water away from the well.
- The vaults and concrete pads were completed flush to the surface.
- Monitoring wells were developed per the SC Work Plan.

ARCADIS collected groundwater samples from monitoring wells MW-K1 through MW-K3, and MW-K6 on November 14 and 15, 2012. Sampling activities were completed in accordance with the PDI Work Plan and the associated FSP. In accordance with the PDI Work Plan, prior to sampling groundwater, ARCADIS field personnel gauged each of the site wells for depth to water and depth to the bottom of the well. Groundwater samples were collected using low-flow sampling procedures. Samples were collected using low-flow purging and sampling with bladder pumps.

Groundwater sampling was conducted in accordance with the PDI Work Plan and the associated FSP. In accordance with the PDI Work Plan, prior to collecting groundwater samples, ARCADIS

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

field personnel gauged each well to measure and record the static groundwater level and to determine the presence or absence of NAPL, if any. Per the FSP, prior to collecting groundwater samples, ARCADIS field personnel monitored groundwater field parameters (consisting of conductivity, dissolved oxygen, oxidation-reduction potential, pH, temperature, and turbidity) until they stabilized.

A total of four groundwater samples were collected and submitted to TestAmerica for the following analyses:

- TCL VOCs (USEPA SW-846 Method 8260)
- TCL SVOCs (USEPA SW-846 Method 8270)
- TAL metals (USEPA SW-846 Methods 6010/7470/7471)
- Cyanide, total, amenable, and free (USEPA SW-846 Methods 9010/9012B/9016)
- pH (USEPA SW-846 Method 9040B)

Samples collected from MW-K1, MW-K2, and MW-K3 were also analyzed for the following to support the evaluation of material compatibility for piping and grout as well as the bench scale evaluation of material (piping and/or grout material) compatibility and establish baseline geochemical characteristics.

- TPH (USEPA SW-846 Method 8015B)
- Inorganics, including ammonia, nitrate, nitrite, sulfate, sulfide, chloride, phosphate, fluoride and carbonate/bicarbonate (Methods SW-846 9056, SM4500S2-E, SM4500P-E, SM-2320B)

Table 1 presents a PDI sample analyses summary. In addition to groundwater sampling, *in-situ* pH readings were collected from groundwater in borings SB-01, SB-02, SB-03, and SB-05 at multiple depths using discrete groundwater sampling methods. Results of the in-situ pH readings are discussed in the PDI results section below.

PDI Task 3 – Storm Sewer Water Investigation

Results of video inspections (conducted previously by others) indicate erosion of the concrete material and separation at the pipe joints within the storm sewer structures (catch basins and piping). This deterioration provides a means for groundwater infiltration into the storm sewer pipe

ARCADIS collected storm sewer water samples from three catch basins (Inlets #111, #112, and #120) and the storm water outfall (OF-1) along the storm sewer pipe on June 20, 2012 during dry weather conditions. Storm sewer water was not observed in catch basin #113 and thus no sample was collected from this catch basin.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Storm sewer water quality field parameters were measured prior to sampling, including conductivity, dissolved oxygen, oxidation-reduction potential, pH, temperature, and turbidity.

Storm sewer water samples were collected directly into the sample bottle from outfall OF-1. Storm sewer water samples were collected with dedicated tubing and a peristaltic pump from catch basins (Inlets #111, #112, and #120). Storm sewer samples were submitted to TestAmerica for the following analyses:

- TCL VOCs (USEPA SW-846 Method 8260)
- TCL SVOCs (USEPA SW-846 Method 8270)
- TAL metals (USEPA SW-846 Methods 6010/7470/7471)
- Cyanide, total and free (USEPA SW-846 Methods 9010/9016)
- pH (USEPA SW-846 Method 9040B)
- TPH (USEPA SW-846 Method 8015B)
- Inorganics, including ammonia, nitrate, nitrite, sulfate, sulfide, chloride, phosphate, fluoride and carbonate/bicarbonate (Methods SW-846 9056, SM4500S2-E, SM4500P-E, and SM-2320B)

Amenable cyanide was not analyzed due to a shortage of reagent at the laboratory at the time of sampling.

PDI Task 4 – Geotechnical Investigation

NYEG drilled two geotechnical borings (GB-01 and GB-02) between October 11 and November 20, 2012 to support the design of the dry weather discharge pipe rehabilitation/replacement. Prior to drilling, each location was hand-cleared to a depth of 5 feet below ground surface (bgs) using a hand auger. The soil borings were drilled using 4.25-inch hollow-stem auger (HSA) to depths of 45 feet and 47 feet bgs, respectively. Due to shallow HSA refusal (28 feet bgs) during the installation of GB-01, alternative drilling methods, consisting of mud-rotary and HQ rock coring, were required to reach the target depth of the boring. Soil samples were collected continuously from each boring using a 2-foot long, 2-inch diameter split-spoon sampling device from the ground surface to the confining unit (12.6 feet bgs in GB-01 and 24.7 feet bgs in GB-02) and then standard sampling thereafter (i.e., one sample every 5 feet). An ARCADIS field geologist photographed, visually characterized, and screened each sample in the field for VOCs using a PID. Upon completion, borings were tremie-grouted to grade using a cement/bentonite grout. Soil boring logs are provided in Appendix A and locations of the geotechnical soil borings are shown on Figure 2.

Six geotechnical soil samples were submitted to Geotesting Express for analysis of the following geotechnical parameters:

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

- Grain size (American Society of Testing and Materials [ASTM] D422)
- Atterberg limits (ASTM D4318)
- Moisture content (ASTM D2216)
- Specific gravity (ASTM D854)

A geotechnical testing summary is presented as part of Table 1.

PDI Results

This section presents the results of the soil, groundwater, and storm sewer water PDI activities. More detailed results for the investigation activities conducted near the storm sewer and across the Krasdale property are presented in the Site Characterization Report (ARCADIS 2013).

Soil Investigation Results

Lithology

The subsurface lithology near the storm sewer pipe is depicted on the cross-section presented on Figure 3 (cross-section location shown on Figure 2). As indicated on the cross-section, the area surrounding the storm sewer pipe is composed of five distinct units: two fill units, a silt-clay unit, a deeper sand unit, and bedrock. The shallowest units are the fill units. The first fill unit lies within the western portion of the site. This fill is composed of sand, gravel, cobbles, purifier wastes (wood chips and wood pulp), and other debris such as brick, ash, coal, slag, fabric/geotextile, and wood. The second fill unit is located adjacent to the river within the area that was filled in between 1947 to 1975 and is composed of fine to medium sands and silty sands with occasional coarser sands and gravels. This fill unit does not contain significant debris or purifier waste. Both fill units are underlain by a silt-clay unit described as a silty clay to clay with occasional fine sand lenses and peat. The silt-clay unit is considered to be a confining layer at the site. Below the silt-clay unit is a sand unit composed of silty fine to medium sand and weathered bedrock. A layer of schist bedrock serves as the lowermost unit for the site.

Visual Observations

ARCADIS's field geologist noted visual observations of soil impacts as recorded on boring logs (Appendix A) and shown on Figure 4. In addition to the visual impacts identified in soil samples, field personnel noted the presence of tar boils at the surface in several locations near SB-09, SB-10, and SB-16 as well as blue staining on a rock near outfall OF-1.

An area of purifier waste is located in the center of the northern portion of the site. The top of the purifier waste material in this area is encountered between approximately 1 and 4 feet bgs in this area and is present at thicknesses between 0.1 and 8.5 feet. Based on the configuration of the purifier waste delineated by others on Parcel D (which is located immediately north of the storm

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

sewer pipe), the purifier wastes observed in the northern portion of the site are likely a continuation of the purifier wastes on Parcel D. Along the northern site boundary, the purifier waste extends from between soil borings SB-10 and SB-01 to between soil borings SB-03 and SB-04 (an approximate 300 foot long area along the length of the storm sewer pipe). Green staining observed at SB-04 and SB-07 may also indicate the periphery of purifier waste impacts. Although a significant amount of the purifier waste encountered in this area is located above the water table (approximately 6 to 10 feet bgs), between 3 to 6 feet of the purifier waste material extends below the water table in the area of the storm sewer pipe.

MGP-like odors were noted throughout the fill ranging from faint to strong and described as MGP-like, tar-like, and petroleum-like. In addition to purifier waste, soils saturated with viscous tar were observed at depths above the water table in two borings: SB-10 (5 to 5.9 feet bgs) and SB-16 (1 to 1.3 feet bgs) in the northwest corner of the site (west of the storm sewer pipe). Sheen was observed at borings SB-07 (10 to 12 feet bgs) and SB-09 (4 to 5 feet bgs).

Vertical delineation of visual and olfactory impacts was obtained at each of the soil borings located near the storm sewer through the visual characterization of deeper soil with no impacts in all borings in the northern portion of the site. All visual indications of purifier waste were encountered above the silt-clay unit.

Analytical Results

ARCADIS submitted a total of 25 soil samples (excluding duplicates) collected from the 11 borings (SB-01 through SB-10, SB-16) to TestAmerica for laboratory analysis. Analytical results are summarized below and presented in Table 2. The primary constituents of concern (or groups of constituents) based on the results obtained from the laboratory analyses consist of VOCs (primarily benzene, toluene, ethyl benzene and xylenes [BTEX] and carbon disulfide); polycyclic aromatic hydrocarbons (PAHs); and cyanide. Although not a constituent, pH is also discussed below as an indicator of impacts for the constituents detected in soil. A detailed discussion of all constituents is included with the Site Characterization Report (ARCADIS 2013).

Figures 5 through 9 depict analytical results of the primary constituents identified above. Two panels are presented on each figure, with the left panel depicting sample results from samples collected within the interval where visual or olfactory impacts were observed and the right panel depicting sample results from samples collected below where impacts where observed or immediately above the water table at locations where no visual impacts were observed.

Results obtained for the laboratory analysis of the soil samples were compared to NYSDEC Subpart 375 Remedial Program Soil Clean-up Objectives (SCOs) for restricted (commercial) and unrestricted uses and NYSDEC CP-51 Soil Cleanup Guidance – Residential Supplemental Soil Cleanup Objective (SSCO) when SCOs were not available.

VOCs

BTEX were detected at relatively low concentrations compared to the SCOs (i.e., total BTEX less than 5 milligrams per kilogram [mg/kg]) in all but three samples: SB-09 (4-5 feet bgs); SB-10 (5-6 feet bgs); and SB-16 (1-1.3 feet bgs). These three samples were collected north of the storm

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

sewer pipe in an area where tar was encountered. BTEX does not appear to be associated with the purifier waste.

Carbon disulfide was detected at concentrations exceeding the SSCO of 100 mg/kg in two soil samples SB-03 (10-10.9 feet bgs) and SB-06 (4-5 feet bgs). Carbon disulfide was also detected at concentrations exceeding the CP-51 protection of groundwater soil cleanup objective of 2.7 mg/kg in six additional soil samples (sample locations SB-01, SB-02, SB-03, SB-04, SB-07 and SB-10) at concentrations ranging from 16 to 54 mg/kg. These borings generally were located in the area of the purifier waste and the samples were generally collected from depths below the water table.

Total BTEX and carbon disulfide concentrations in soil are depicted on Figures 5 and 6, respectively.

PAHs

Individual PAHs were detected in several soil samples at concentrations greater than SCOs. However, elevated concentrations of total PAHs (i.e., greater than 500 mg/kg) were only detected in two soil samples SB-10 (5-6 feet bgs) and SB-16 (1-1.3 feet bgs). As indicated above, these two samples were collected west of the storm sewer pipe in an area where tar was observed. Significant concentrations of PAHs do not appear to be associated with the purifier waste.

Total PAH concentrations in soil are depicted on Figure 7.

Cyanide

Total cyanide was detected at concentrations greater than the SCO of 27 mg/kg in seven soil samples collected from six soil boring locations at concentrations ranging from 32.7 to 2,080 mg/kg. The highest concentration of total cyanide was detected in soil sample SB-03 (10-10.9 feet bgs). However, a duplicate sample collected at the same location only contained total cyanide at a concentration of 149 mg/kg. In general, the locations where total cyanide was detected at elevated concentrations were collected from areas and depth intervals within the purifier waste. As would be expected, cyanide appears to be associated with the purifier waste.

Total cyanide concentrations in soil are depicted on Figure 8.

TPH

Seven soil samples collected from soil borings SB-01, SB-02, and SB-03 were analyzed for TPH. TPH was detected in four of the seven samples at concentrations ranging from 190 mg/kg to 1,000 mg/kg. TPH results were collected to evaluate compatibility for pipe materials.

pH

Lower soil pH values (less than 6 standard units [SU]) were measured in soil samples collected from the purifier waste area. In contrast, along the northwestern corner of the northern portion of the site and within the filled area adjacent to the Bronx River, pH values are generally higher than

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

7 except near borings SB-05 and SB-08. Where low pH values are observed in the fill, the pH values of native soils below the fill are also generally low. The soil pH distribution is depicted on Figure 9.

Groundwater Investigation Results

ARCADIS sampled the four new groundwater monitoring wells (MW-K1 through MW-K3, MW-K6) as part of the PDI activities. Groundwater samples were submitted to TestAmerica for laboratory analysis. An analytical sample summary table is presented as Table 1 and groundwater analytical results are summarized below and presented in Table 3. Similar to soil, the primary constituents of concern (or groups of constituents) based on results obtained from the laboratory analyses consist of VOCs (BTEX and carbon disulfide); PAHs; and cyanide. Groundwater pH is also discussed in this section. Additionally, sulfate results are also presented based on their detected concentrations. Results are screened against the New York State Part 703.5 Water Quality Standards for Groundwater.

Groundwater monitoring forms are included as Appendix B.

VOCs

Total BTEX was detected in the groundwater samples collected from monitoring wells MW-K1 (estimated concentration of 95 micrograms per liter [µg/L]) and MW-K6 (1,683 µg/L) at concentration exceeding laboratory detection limits. BTEX exceeded their respective groundwater standards in the sample collected from monitoring well MW-K6 and benzene (95 µg/L) exceeded the groundwater standard of 1 µg/L in the sample collected from monitoring well MW-K1. These wells are located west of the storm sewer pipe or toward the western end of the storm sewer. Based on the soil analytical results, the dissolved phase concentrations of BTEX at these locations are most likely associated with the tar encountered in the northwest corner of the site as well as impacts associated with Parcel D to the north of the storm sewer pipe. The purifier waste is not associated with the dissolved-phase BTEX concentrations.

Carbon disulfide was detected at concentrations above the groundwater standard (60 µg/L) in 3 of the 4 samples collected from the monitoring wells at concentrations ranging from 14,000 µg/L to 100,000 µg/L. Carbon disulfide exceeded the groundwater standard in monitoring wells MW-K1 through MW-K3. The highest concentrations of carbon disulfide (16,000 to 100,000 µg/L) were observed at monitoring wells MW-K1 and MW-K2, which were screened within purifier wastes located in the central section of the northern portion of the site. Carbon disulfide was also detected at monitoring well MW-K3, which was not screened in purifier wastes but is located hydraulically downgradient of the aforementioned wells.

Analytical results for VOCs in groundwater are presented on Figure 10.

PAHs

Individual PAHs were detected in each of the groundwater samples at concentrations exceeding the groundwater standards. The highest concentrations of PAHs were detected in the groundwater samples collected from MW-K6 (3,540 µg/L) and MW-K2 (1,970 µg/L). MW-K6 is located to

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

the west of the storm sewer pipe in the area where tar was observed. Groundwater samples collected from monitoring wells MW-K1 and MW-K3 contained total PAHs at estimated concentrations of 624 µg/L and 389.2 µg/L, respectively. Naphthalene was the primary PAH that was detected in the groundwater samples and accounted for more than 80% of the total PAH concentration (more than 90% in all except for one sample). The dissolved phase concentrations of PAHs, primarily naphthalene, are likely associated with the tar observed in the northwestern corner of the site and possibly with the MGP-residuals located on Parcel D.

Analytical results for PAHs are presented on Figure 11.

Cyanide

Total cyanide was detected in each of the groundwater samples collected from each of the monitoring wells at concentrations exceeding the groundwater standard of 200 µg/L. Detected concentrations ranged from 240 µg/L to 1,400 µg/L (in the groundwater sample collected from monitoring well MW-K2).

Amenable cyanide was detected in each of the groundwater samples at concentrations ranging from 93 µg/L to 1,100 µg/L (also in the sample collected from MW-K2). Free cyanide was detected in 3 of the 4 groundwater samples collected at concentrations ranging from 14.8 µg/L to 211 µg/L. The percent (%) free cyanide ranged from 6.2% to 15.1%. The distribution of cyanide in groundwater is depicted on Figure 12.

Sulfate

Sulfate was detected in the three groundwater samples collected from the wells within the purifier waste area at concentrations ranging from 5.6% to 12.4% (i.e., more than 5,600,000 µg/L).

pH

In-situ pH readings were collected from groundwater in borings SB-01, SB-02, SB-03, and SB-05 at multiple depths in each boring to evaluate the vertical pH profile. *In-situ* measurements of pH are presented below in standard units (SU):

Boring	**pH Range (SU)**	**Depth (feet bgs)**
SB-01	3.48	10
SB-01	4.4	15
SB-02	2.63	10
SB-02	2.94	13
SB-03	1.52 to 1.79	15
SB-03	3.28	20
SB-05	5.7	15
SB-05	5.52	20

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Lower pH values are observed in the borings with purifier wastes (SB-01 to SB-03) compared to boring SB-05, where purifier wastes were not observed.

Low pH levels (between 1.18 and 2.7 SU were also measured in groundwater samples collected from monitoring wells MW-K1 through MW-K3. The lower pH values were observed in the wells screened within purifier wastes (MW-K1, MW-K2) and the well downgradient of these wells (MW-K3). In contrast, the pH measured in the groundwater sample collected from monitoring well MW-K6 was 7.06 SU. Figure 13 depicts the pH distribution in groundwater at the site.

Storm Sewer Water Investigation Results

Storm sewer water samples were collected from three catch basins (Inlets #111, #112, and #120) and the storm water drain outfall (OF-1). Analytical results are discussed below and provided in Table 4. Screening criteria are not available for the storm sewer water samples.

VOCs

Benzene was only detected in one of the four samples at a concentration of 130 µg/L.

Carbon disulfide was detected in each water sample at concentrations ranging from 33,000 µg/L to 45,500 µg/L (detected in the water sample collected from Inlet #111).

Although other VOCs were detected in the storm sewer water samples, carbon disulfide was the primary compound detected (i.e., greater than 94% of the total VOC concentration detected in each sample).

PAHs

PAHs were detected in each of the water samples. Total PAHs were detected at concentrations ranging from 754 µg/L to 1,856 µg/L with the highest concentration detected in the water sample collected from Inlet #112. Similar to the groundwater, naphthalene was the primary PAH that was detected in the water samples accounting for between 87.5 and 91.6% of the total detected PAHs in the water samples.

Cyanide

Total cyanide was detected in each of the storm sewer water samples at concentrations ranging from 590 µg/L to 770 µg/L. Free cyanide was detected in each storm sewer water sample at concentrations ranging from 480 µg/L to 961 µg/L. Free cyanide was detected at higher proportions of the total cyanide concentrations in the storm sewer water samples than those in the groundwater samples, ranging from 81.3% to 100%. *Sulfate*

Sulfate was detected in each of the storm sewer water samples at percentage concentrations ranging from 7.1% to 7.6% (i.e, more than 7,000,000 µg/L).

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

pH

Measured pH in the storm sewer water samples ranged from 1.38 to 1.44 SU.

Geotechnical Investigation Results

Geotechnical samples were submitted to Geotesting Express for geotechnical testing to support the design of the storm sewer pipe rehabilitation/replacement. Geotechnical testing reports are included in Appendix C

Conceptual Model for the Storm Sewer Pipe Area

The overall conceptual model for the storm sewer pipe area was formed based on the observations and analytical results obtained for the PDI.

- Purifier media (likely iron oxide impregnated wood chips) used to remove hydrogen sulfide, hydrogen cyanide and organic sulfur (e.g. carbon disulfide) from manufactured gas became spent from the sulfur accumulation and was disposed, resulting in the purifier waste areas observed in the northern portion of the site. The wastes contain metals, ammonia (ammonium compounds), sulfur (elemental, sulfate, and carbon disulfide), and cyanide (simple and complexed) compounds, organic matter, as well as tars not captured in preceding manufactured gas cleanup steps.

- Elemental and reduced sulfur present in the purifier wastes when in contact with oxygenated water, for example, that are present in near surface aquifers can oxidize to sulfate ions and form a sulfuric acid bearing groundwater resulting in low pH conditions in the groundwater as observed at wells MW-K1 through MW-K3 (1.18 SU to 2.7 SU) and within the groundwater infiltrating into and within the storm sewer (<2 SU). The pH conditions less than 2.0 SU and the sulfate levels in the groundwater indicate the presence of sulfuric acid - a comparatively strong acid. When sulfuric acid solutions have pH values less than about 2.0, pH is no longer a full measure of the solution's degree of acidity. At pH values less than 2.0, the hydrogen ion reacts with sulfate ion forming the bisulfate ion. The bisulfate ion forms an additional "repository of acidity". Consequently, the groundwater may be more acidic than represented by the pH measurements alone.

- The low pH (<2 S.U.) conditions result in the dissolution of metal/ ammonium cyanide compounds including certain complex metal cyanide compounds (e.g., ferric ferrocyanides, ferrous ferrocyanides) typically not dissociable under higher pH conditions; these compounds are known as strong-acid dissociable cyanide compounds. At pH conditions between 3 and 6, certain complex transition metal cyanide compounds (e.g., copper, nickel cyanide complexes) are also dissociable; these compounds are known as weak-acid dissociable cyanide compounds. Both the strong and weak acid conditions at the site result in the presence of

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

metals, ammonium, as well as cyanides and free cyanides (as hydrogen cyanide) in the groundwater including the groundwater infiltrating into the storm sewer.

- Based on the investigation activities conducted across the Krasdale property (Site Characterization Report [ARCADIS 2013]), for the most part, the constituents related to the MGP residuals have impacted the groundwater within and near the residuals but not further hydraulically downgradient along the river due to the fate and transport properties of these constituents in addition to the presence of the filled area acting as a buffer zone. However, groundwater samples collected from monitoring well MW-K3, located adjacent to the river (i.e., outside the observed limits of the purifier waste residuals), contained constituents at concentrations consistent with groundwater samples collected from monitoring wells located within the limits of the purifier waste residuals. The presence of dissolved phase constituents at these concentrations outside the limits of the residuals may be indicative of transport via groundwater flow and/or preferential transport within the storm sewer. The planned storm sewer replacement could beneficially affect the groundwater quality at this location by removing MGP residuals.

Conceptual Design for Dry Weather Discharge Pipe Replacement

As presented in a July 12, 2011 letter from the New York State Department of Environmental Conservation (NYSDEC) to Con Edison, NYSDEC identified the following remedial action objectives (RAOs) for OU-2:

- Preventing the continuing discharge of contaminants to surface water (i.e., the Bronx River).
- Removing the source of groundwater or surface water contamination, to the extent feasible.
- Preventing migration of contaminants that would result in groundwater or surface contamination.

The recommended rehabilitation measure consists of replacing the existing subject storm sewer pipe in the same alignment, including the replacement of existing catch basins. A conceptual design for the installation of the new storm sewer consists of:

- Installing a bypass pumping and treatment system for storm water and groundwater (i.e., for bypassing potential storm water and dry weather discharge that may enter the storm sewer during construction.
- Saw-cutting the asphalt pavement along the storm sewer pipe limits.
- Excavating asphalt pavement and gravel pipe bedding, stockpiling separately and managing as dictated by the results of the PDI soil boring program.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

- Excavating subsurface soils and any potential MGP source materials to a depth of approximately two feet below the invert of the existing storm sewer pipe and associated catch basins (i.e., anticipated excavation depths ranging from approximately 6.5 to 10 feet bgs) to facilitate removal of the existing pipe and catch basins and install the new storm sewer pipe, catch basins and low permeability CLSM layer. The proposed pipe replacement would remove MGP residuals along the pipe alignment. Although some MGP residuals would remain below the CLSM layer, this remaining material: 1) is considered minimal relative to the amount of material located on Parcel D (which is anticipated to be remediated in the future) and 2) will be isolated by the low permeability CLSM layer, which would cut off the storm sewer as a potential migration pathway for impacted groundwater to the river. The proposed pipe replacement and removal of residuals is expected to improve groundwater quality within OU-2.

- Installing new catch basins using an appropriate material to be compatible with the low pH/corrosive conditions that exist near the existing storm sewer.

- Backfilling the trench with a layer of CLSM, which will act as a solid, low permeability layer that will limit the conveyance of contaminated groundwater along the pipe alignment. The CLSM will be designed and further tested using site groundwater to be less susceptible to the corrosive conditions that currently exist around the storm sewer pipe.

- Installing a new zero-leakage storm drainage pipe (made of similar or equally compatible materials as the catch basins) on the CLSM followed by the placement of additional CLSM to the spring line (half the height) of the pipe.

- Installing trench collars to further reduce the potential for the pipe bedding/trench to serve as a preferential pathway for impacted groundwater.

- Backfilling the remaining area with structural fill up to near the top of trench.

- Restoring the surface of the backfilled trench to match pre-construction conditions (i.e., asphalt pavement).

- Sidewall excavation support may be needed (such as trench boxes or other type of engineered support system).

The excavated materials and debris generated during pipe replacement activities will be managed and transported off-site for treatment and disposal. Temporary disruption to certain operations at the Krasdale property may occur in the form of reduced parking area for the trucks on site, as a portion of the property will be occupied by pipe and catch basin materials, as well as excavated soil stockpiles, backfill materials, and shoring equipment

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Similar to the Iroquois Pipeline replacement, which occurred within Food Center Drive the excavation activities near the storm sewer pipe would remove a significant amount of purifier waste. However, some purifier waste would remain in place below the pipe. Remaining material would be capped under a low permeability CLSM layer that would serve to limit the amount and conveyance of water along the pipe line and within the pipe bedding material.

Pipe materials would be selected to be leak proof (i.e., allow zero infiltration of groundwater) and would be compatible with the existing surrounding conditions as characterized by the PDI activities. Additionally, the CLSM would be designed to be resistant to the surrounding conditions. However, it should be noted that the CLSM placed around the pipes will be susceptible to degradation over time due to the corrosive groundwater conditions. Field testing and design modifications will be made to the CLSM to increase its durability.

Desk Top Compatibility Evaluations

Analytical results for soil, groundwater, and surface water samples collected during the PDI were used to conduct a desk top compatibility evaluation for CLSM and pipe materials. As indicated in the conceptual model, purifier wastes in the area of the storm sewer pipe have created a corrosive environment with pH in groundwater less than 2 SU in several locations. In order to mitigate the storm sewer pipe from serving as a conduit for the conveyance of dry weather discharge, appropriate materials must be selected that will be resistant to the current soil and groundwater chemistry near the pipe.

ARCADIS coordinated with concrete suppliers and reviewed industry standards/research to identify CLSM mix designs/additives that have been historically used in low pH conditions. Additionally, ARCADIS coordinated with pipe vendors/manufacturers to identify pipe materials that are compatible with the constituents in the site groundwater.

Summaries of the desk top evaluations for CLSM and pipe materials are presented below.

CLSM

CLSM is an inert material typically comprised of a mixture of sand, Portland cement, fine aggregate (e.g. sand, fly ash), and water. CLSM is similar to concrete, but has a lower compressive strength (e.g. less than 1200 pounds per square inch [psi]) (ACI 229R-99, 2005). The primary reagent found in CLSM, Portland cement, has been widely and successfully used in environmental applications for in-situ encapsulation of soils and groundwater impacted with VOCs and metals. In-situ encapsulation is commonly referred to as in-situ stabilization/solidification (ISSS). ISSS typically has lower or equal compressive strengths (typically 50 psi minimum required) when compared to CLSM and comparable results can be expected for durability and compatibility to VOCs and metals.

The soil and groundwater chemical environment has pH values below 2.0 SU and high sulfate concentrations, which can cause rapid deterioration of concrete. Therefore, using a CLSM

mixture which contains high amounts of Portland cement will result in decreased longevity of the CLSM mixture. In order to delay/slow degradation to the CLSM backfill material, the following constituents can be added to a CLSM mix:

- Class F fly ash
- Potassium silicate as a cementing agent (Grade N potassium silicate with 28% total dissolved silica)
- A water reducing agent such as lignosulfonate
- Ice as a hydrating agent to keep the fill material cool
- An acid and sulfate resistant cement type material

The following installation steps can also extend the longevity of the CLSM mixture:

- Neutralizing the site groundwater.
- Conducting the sewer pipe replacement during the winter months to keep the CLSM mix cold. The low pH of the groundwater can cause heat reactions when contacting water in the CLSM mix.
- Bench-scale testing of the CLSM design mix with site groundwater before the CLSM mix is used at the site.

Pipe Materials

The following available pipe materials were evaluated for use as the replacement sewer pipe at the site:

- Polyvinyl-chloride (PVC)
- High-density polyethylene (HDPE)
- Concrete
- Fiberglass
- Ductile Iron

Resistant coatings were also considered for each pipe material. PVC, fiberglass and concrete were eliminated as possible pipe materials, due to the incompatibility of these pipe materials with the constituents and conditions identified in the site soil and groundwater.

HDPE is a possible pipe material, because it is compatible with the site constituents and conditions. The only exception is xylenes, which were detected in select soil samples. Due to the concern of possible deformation of HDPE from the loads generated by high traffic trucks above,

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

the depth of cover and CLSM mix will need to be evaluated during the design phase before HDPE is selected as the pipe material.

Ductile iron pipe material is a possible pipe material, because it is compatible with the site constituents and conditions. The only exception is the low pH, which can corrode iron. However if the iron pipe is coated with polyethylene (PE) the PE coating would be resistant to low pH environments.

The use of bell/spigot push-on style ductile iron gaskets with an exterior asphaltic and PE coating are also possible pipe materials. Gaskets made of ethene propylene diene monomer (EPDM) or fluoroelastomer (FKM) would provide better chemical resistance.

The materials for the catch basins were evaluated as well. Due to the loading from the semi-trucks at the site, heavy duty precast concrete with a cast-iron gate is a possible catch basin material. Both concrete and iron are subject to corrosion in low pH environments, an interior and exterior coating of novolac vinyl ester on the precast concrete is a possible solution as the vinyl ester is resistant to low pH environments.

Finally, compatibility considerations were evaluated for the connections between the pipe and catch basins. Rubber will corrode in low pH environments. A non-shrink grout is a possible solution for joints between the pipe and catch basins.

Remedial Action Work Plan

Following approval of the conceptual design for the storm sewer replacement, Con Edison will prepare a Remedial Action Work Plan (RAWP). The RAWP will serve as the final design for the storm sewer replacement and will include sufficient detail including text, design drawings, technical specifications and associated construction plans (i.e., Community Air Monitoring Plan, Community Environmental Response Plan, if deemed necessary, Construction Quality Assurance Plan, and Contingency Plan) to implement the storm sewer replacement. Additionally, the selection of the new storm sewer pipe material and CLSM design mix will be finalized and presented in the RAWP. The RAWP will be prepared and submitted to the NYSDEC for review and approval prior to procurement of a construction contractor to implement the storm sewer replacement.

Remedial Action Work Plan Schedule

Upon NYSDEC's approval of the conceptual design for the storm sewer replacement, Con Edison will provide a schedule for submitting the RAWP.

Consolidated Edison Company
of New York, Inc.
31-01 20th Avenue
Long Island City NY 11105-2048
www.conEd.com

Please contact me at (718) 204-4205 or at skorobogatovy@coned.com if you have any comments or questions regarding this submittal.

Very truly yours,

Yelena Skorobogatov
Technical Specialist
MGP Remediation
Environment, Health and Safety

cc: J. Moras, NYSDEC – 1 electronic copy (via e-mail)
S. Selmer, NYSDOH – 1 hard copy
Dena Putnick , Esq., NYSDEC – 1 electronic copy (via e-mail)
T. Bell, EDC – 1 hard copy
K. Kasier, Con Edison– 1 electronic copy (via e-mail)
M. Miller, ARCADIS– 1 electronic copy (via e-mail)
J. Brien, ARCADIS– 1 electronic copy (via e-mail)
M. Hayes, ARCADIS -1 electronic copy (via e-mail)

References

ARCADIS. 2010. *Off-Site Characterization Work Plan, Hunts Point Former Manufactured Gas Plant*. November.

ARCADIS. 2011a. *Site Characterization Work Plan Krasdale Foods Inc. Leasehold, Hunts Point Former Manufactured Gas Plant*. February.

ARCADIS. 2011b. *Dry Weather Discharge Evaluation Work Plan, Krasdale Foods Inc. Leasehold, Hunts Point Former Manufactured Gas Plant*. January.

ARCADIS. 2012. *Pre-Design Investigation Work Plan for the Krasdale Foods, Inc. Property*.

American Concrete Institute (ACI). 2005. *Controlled Low Strength Materials,* ACI 229R-99. Farming Hills, MI.

RETEC. 2007. *Characterization of Soil Background PAH and Metal Concentrations. Manhattan, New York.* RETEC Project Number CECN3-19297-800. Prepared for Consolidated Edison Company of New York, Inc. March 24.

ARCADIS

Tables

Table 1
Sample Summary

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Location	Depth	Date	PCBs	VOCs/ BTEX	SVOCs/PAH	Total and Free Cyanide	Carbonate/Bicarbonate	Ammonia	Nitrate	Nitrite	Chloride	Corrosivity	Cyanide, Amenable	Fluoride	pH	Phosphate	Sulfate	Sulfide	TPH	Moisture Content	Atterberg Limits	Grain Size - Sieve and Hydrometer	Specific Gravity
Storm Water Samples																							
I-111	- -	6/20/2012		X	X	X		X	X	X	X				X	X	X	X	X				
I-112	- -	6/20/2012		X	X	X		X	X	X	X				X	X	X	X	X				
I-120	- -	6/20/2012		X	X	X		X	X	X	X				X	X	X	X	X				
OF-1	- -	6/20/2012		X	X	X		X	X	X	X				X	X	X	X	X				
Groundwater Samples																							
MW-K1	- -	11/14/2012		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X				
MW-K2	- -	11/15/2012		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X				
MW-K3	- -	11/15/2012		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X				
MW-K6	- -	11/14/2012		X	X	X	X	X	X	X			X		X	X		X					
Soil Samples																							
SB-01	10' - 10.8'	6/15/2012	X	X	X	X	X	X	X	X	X			X		X	X	X	X				
SB-01	12' - 13'	6/15/2012	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X				
SB-02	11.5' - 13.1'	6/15/2012	X	X	X	X	X				X	X		X	X		X		X				
SB-02	14' - 15'	6/15/2012	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X				
SB-03	4.5' - 5'	6/14/2012	X	X	X	X						X			X								
SB-03	10' - 10.9'	6/21/2012	X	X	X	X	X				X	X		X	X	X	X		X				
SB-03	10.9' - 11.7'	6/21/2012	X	X	X	X	X				X			X		X	X		X				
SB-04	0' - 1'	6/14/2012	X	X	X	X						X			X								
SB-04	10.2' - 11.4'	6/21/2012	X	X	X	X						X			X								
SB-04	17.2' - 18.2'	6/21/2012	X	X	X	X						X			X								
SB-05	10.9' - 11.9'	6/20/2012	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X				
SB-06	4' - 5'	6/14/2012	X	X	X	X						X			X								
SB-06	12.2' - 13.2'	6/19/2012	X	X	X	X						X			X								
SB-07	4.5' - 5'	6/14/2012	X	X	X	X						X			X								
SB-07	10.5' - 12.5'	6/19/2012	X	X	X	X						X			X								
SB-07	16.4' - 17.4'	6/19/2012	X	X	X	X						X			X								
SB-08	12.8' - 13.9'	6/19/2012	X	X	X	X						X			X								
SB-08	13.9' - 14.5'	6/19/2012	X	X	X	X						X			X								
SB-09	4' - 5'	6/18/2012	X	X	X	X						X			X								
SB-09	8' - 8.9'	6/22/2012	X	X	X	X						X			X								
SB-10	4.2' - 5'	6/19/2012	X	X	X	X						X			X								
SB-10	5' - 6'	6/22/2012	X	X	X	X						X			X								
SB-10	7.4' - 8.4'	6/22/2012	X	X	X	X						X			X								
SB-16	1' - 1.3'	6/18/2012	X	X	X	X						X			X								
SB-16	7.9' - 8.9'	6/22/2012	X	X	X	X						X			X								
Geotechnical Samples																							
GB-01	20' - 22'	10/19/2012																		X		X	X
GB-01	35' - 37'	11/20/2012																		X		X	
GB-02	5' - 7'	10/17/2012																		X		X	
GB-02	13' - 15'	10/17/2012																		X	X	X	X
GB-02	30' - 32'	10/18/2012																		X		X	X
GB-02	40' - 42'	10/18/2012																		X		X	

Notes:

	Analysis conducted by TestAmerica located in Burlington, Vermont.
	Analysis conducted by Geotesting Express located in Acton, Massachusetts.

BTEX = Benzene, toluene, etylbenzene, and xylenes
PCBs = Polychlorinated biphenyl
SVOCs = Semi-volatile organic compounds
VOCs = Volatile organic compounds

Table 2
Summary of Soil Sample Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Location ID:	Units	Unrestricted Use SCO	Restricted Use SCO - Public Health Commercial	CP-51 Guidance Values	SB-01	SB-01	SB-02	SB-02	SB-03	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-06	SB-06	SB-07	SB-07	SB-07	SB-08	SB-08	SB-09	SB-09	SB-10	SB-10	SB-10	SB-16	SB-16
Sample Depth(Feet):					10 - 10.8	12 - 13	11.5 - 13.1	14 - 15	4.5 - 5	10 - 10.9	10.9 - 11.7	0 - 1	10.2 - 11.4	17.2 - 18.2	10.9 - 11.9	4 - 5	12.2 - 13.2	4.5 - 5	10.5 - 12.5	16.4 - 17.4	12.8 - 13.9	13.9 - 14.5	4 - 5	8 - 8.9	4.2 - 5	5 - 6	7.4 - 8.4	1 - 1.3	7.9 - 8.9
Date Collected:					06/15/12	06/15/12	06/15/12	06/15/12	06/14/12	06/21/12	06/21/12	06/14/12	06/21/12	06/21/12	06/20/12	06/14/12	06/19/12	06/14/12	06/19/12	06/19/12	06/19/12	06/19/12	06/18/12	06/22/12	06/19/12	06/22/12	06/22/12	06/18/12	06/22/12
PCBs																													
Aroclor-1242	mg/kg	- -	- -	- -	0.011 U	0.0074 U	0.012 U	0.0084 U	0.011 U	0.011 U [0.012 U]	0.013 U	0.034	0.0084 U	0.012 U	0.0071 U	0.013 U	0.014 U	0.0076 U	0.0081 U	0.012 U	0.0078 U	0.0079 U	0.11 U	0.0072 U	0.0084 U	0.0073 U	0.0074 U	0.0077 U	0.0073 U
Aroclor-1254	mg/kg	- -	- -	- -	0.0047 U	0.0031 U	0.0051 U	0.0035 U	0.0046 U	0.0045 U [0.005 UJ]	0.0054 U	0.092	0.0035 U	0.0049 U	0.003 U	0.098	0.0059 U	0.0032 U	0.0034 U	0.0049 U	0.0033 U	0.0033 U	0.044 U	0.003 U	0.0035 U	0.0031 U	0.0031 U	0.0032 U	0.0031 U
Aroclor-1260	mg/kg	- -	- -	- -	0.004 U	0.0026 U	0.0043 U	0.003 U	0.0039 U	0.0038 U [0.0043 UJ]	0.0046 U	0.053	0.003 U	0.0042 U	0.0025 U	0.0047 U	0.005 U	0.0027 U	0.01 J	0.0042 U	0.0028 U	0.0028 U	0.038 U	0.0026 U	0.003 U	0.0026 U	0.0026 U	0.036	0.0026 U
Total PCBs	mg/kg	0.1	1	- -	ND	ND	ND	ND	ND	ND [ND]	ND	**0.179**	ND	ND	ND	0.098	ND	ND	0.01 J	ND	ND	ND	ND	ND	ND	ND	ND	0.036	ND
Volatile Organics																													
2-Butanone	mg/kg	0.12	500	- -	2 U	0.0015 UJ	1.5 U	0.021 J	0.44 U	2.5 U [2.6 U]	0.035 J	0.009 J	0.71 U	0.023 J	0.0016 UJ	1.5 U	0.033 J	0.0076 J	0.19 U	0.057	0.012 J	0.0097 J	1.2 U	0.0014 UJ	0.0014 UJ	39 U	0.0036 J	44 U	0.0034 J
4-Methyl-2-pentanone	mg/kg	- -	- -	- -	2.5 U	0.0006 U	1.9 U	0.0013 J	0.56 U	3.1 U [3.3 U]	0.0011 UJ	R	0.89 U	0.001 U	0.00062 U	1.8 U	0.0012 U	R	0.24 U	0.001 U	0.00063 U	0.00059 U	1.6 U	0.00055 U	0.00055 U	50 U	0.00058 U	55 U	0.00061 U
Acetone	mg/kg	0.05	500	- -	2 U	0.041	**3.9 J**	**0.24 J**	0.46 U	2.6 U [2.7 U]	**0.18 J**	0.031 J	0.73 U	**0.11 J**	0.0079 J	1.5 U	**0.14 J**	0.029 J	**0.36 J**	**0.22 J**	**0.087 J**	**0.059 J**	1.3 U	0.012 J	0.023 J	41 U	**0.054 J**	46 U	0.032
Benzene	mg/kg	0.06	44	- -	0.48 U	0.00071 U	0.36 U	0.0028 J	**0.28 J**	0.6 U [0.63 U]	**0.33 J**	0.00088 U	**0.39 J**	0.014	0.00074 U	**0.56 J**	**0.09 J**	0.00066 U	**0.073 J**	0.048 J	0.00075 U	0.0007 U	**49**	0.00069 J	0.00065 U	**65**	0.00069 U	**40 J**	0.00072 U
Carbon Disulfide	mg/kg	- -	- -	100	36	0.00031 UB	28	0.067	44	**160 [300]**	0.11 J	0.0021 J	54	0.00053 UB	0.00032 U	**130**	0.075 J	0.0031 J	16	0.00052 UB	0.05	0.0055	0.23 U	0.0014 J	0.00029 UB	45 J	0.0003 U	8.2 U	0.00032 U
Chloroform	mg/kg	0.37	350	- -	0.43 U	0.00032 U	0.33 U	0.00039 UB	**1.6**	0.55 U [0.57 U]	0.00059 UB	0.0004 U	0.16 U	0.00055 U	0.00033 UB	**5.5**	0.00065 UB	0.0003 U	0.042 U	0.00054 UB	0.00034 U	0.00032 U	0.27 U	0.00029 U	0.00029 UB	8.7 U	0.00031 U	9.8 U	0.00033 U
Ethylbenzene	mg/kg	1	390	- -	**1.5 J**	0.000056 U	0.7 J	0.000068 UB	0.1 U	0.58 U [0.6 U]	0.0001 UJ	0.000069 U	0.16 U	0.000095 U	0.000058 U	0.34 U	0.00011 UJ	0.00011 J	0.044 U	0.0018 J	0.000059 U	0.000055 U	**110**	0.0025 J	0.000051 UJ	**27 J**	0.00007 J	**150**	0.000057 U
Isopropylbenzene	mg/kg	- -	- -	100	0.43 U	0.000077 U	0.33 U	0.000093 U	0.098 U	0.55 U [0.57 U]	0.00014 UJ	0.000096 UJ	0.16 U	0.00035 J	0.00008 U	0.32 U	0.00016 UJ	0.000087 J	0.042 U	0.0014 J	0.000081 U	0.000076 U	6.5	0.00033 J	0.00057 J	8.7 U	0.000075 U	18 J	0.000078 U
Methyl acetate	mg/kg	- -	- -	- -	0.48 U	0.00063 U	0.36 U	0.00076 U	0.11 U	0.6 U [0.63 U]	0.0023 J	0.00078 U	0.17 U	0.0011 U	0.00065 U	0.36 U	0.0013 U	0.00059 U	0.046 U	0.0011 U	0.00067 U	0.00062 U	0.3 U	0.00058 U	0.00058 U	9.6 U	0.00061 U	11 U	0.00064 U
Methylcyclohexane	mg/kg	- -	- -	- -	0.41 U	0.00017 U	0.31 U	0.00021 U	0.093 U	0.52 U [0.54 U]	0.00031 UJ	0.00021 U	0.15 U	0.00029 U	0.00018 U	0.31 U	0.00035 U	0.00016 U	0.039 U	0.00049 J	0.00018 U	0.00017 U	0.26 U	0.00016 U	0.00016 U	8.3 U	0.00016 U	9.2 U	0.00017 U
Methylene Chloride	mg/kg	0.05	500	- -	0.62 U	0.00055 UB	0.47 U	0.0087	0.14 U	0.78 U [0.82 U]	0.001 UB	0.00068 UB	0.22 U	0.00094 UB	0.00057 UB	0.46 U	0.0032 J	0.00051 U	0.059 U	0.00093 U	0.00058 UB	0.00054 UB	0.39 U	0.00051 UB	0.00051 UB	12 U	0.00053 UB	14 U	0.00056 UB
Styrene	mg/kg	- -	- -	- -	0.39 U	0.0001 U	0.29 U	0.00012 U	0.087 U	0.49 U [0.51 U]	0.00018 UJ	0.00012 U	0.14 U	0.00017 U	0.0001 U	0.29 U	0.0002 UJ	0.000093 U	0.037 U	0.00017 UJ	0.00011 U	0.000099 U	15	0.000092 U	0.000092 UJ	19 J	0.000097 U	36 J	0.0001 U
Toluene	mg/kg	0.7	500	- -	0.46 U	0.0001 U	0.47 J	0.00012 UB	0.12 J	0.58 U [0.7 J]	0.00018 UB	0.00012 UB	0.38 J	0.00017 UB	0.0001 UB	0.53 J	0.0002 UB	0.000093 UB	0.063 J	0.0053 J	0.00011 U	0.000099 UB	**120**	0.0019 J	0.000092 UB	**76**	0.000097 UB	**150**	0.0001 U
Total BTEX	mg/kg	- -	- -	- -	3.3 J	ND	5.67 J	0.0088 J	0.57 J	0.92 J [2.7 J]	0.3314 J	ND	1.62 J	0.014	ND	2.59 J	0.09 J	0.00011 J	0.296 J	0.0635 J	ND	ND	469	0.00889 J	ND	250 J	0.00007 J	690 J	ND
Total VOCs	mg/kg	- -	- -	- -	39.3 J	0.041	37.57 J	0.3468 J	46.17 J	160.92 J [302.7 J]	0.6587 J	0.0421 J	55.62 J	0.14735 J	0.0079 J	138.09 J	0.3412 J	0.039897 J	16.656 J	0.34239 J	0.149 J	0.0742 J	490.5	0.02262 J	0.02357 J	314 J	0.05767 J	744 J	0.0354 J
Xylenes (total)	mg/kg	0.26	500	- -	**1.8 J**	0.00073 U	**4.5**	0.006	0.17 J	**0.92 J [2 J]**	0.0014 J	0.00091 U	**0.85**	0.0012 U	0.00076 U	**1.5 J**	0.0015 UJ	0.00068 U	0.16 J	0.0084 J	0.00077 U	0.00072 U	**190**	0.0038 J	0.00067 UJ	**82**	0.00071 U	**350**	0.00074 U
Semivolatile Organics																													
2,4-Dimethylphenol	mg/kg	- -	- -	- -	1.4 UJ	0.092 U	0.15 U	0.1 U	0.13 U	0.66 U [0.72 U]	0.31 J	0.11 U	0.1 U	0.17 J	0.087 U	0.82 U	0.17 U	0.094 U	0.099 U	0.14 U	0.096 U	0.1 U	2.6 UJ	0.09 U	0.1 U	67 UJ	0.092 U	9.4 UJ	0.091 U
2-Methylnaphthalene	mg/kg	- -	- -	0.41	**4.4 DJ**	0.048 U	**1.5**	0.061 J	**1.4**	**3 [3.4]**	0.082 U	0.22 J	0.14 J	0.073 U	0.045 U	**6.2**	0.091 U	0.049 U	**0.59**	0.4 J	0.05 U	0.052 U	**18 DJ**	0.047 U	0.054 U	**1,100 DJ**	0.048 U	**260 DJ**	0.047 U
3 & 4 Methylphenol	mg/kg	- -	- -	- -	0.96 UJ	0.063 U	0.1 U	0.07 U	0.13 J	0.46 U [0.5 U]	0.18 J	0.073 U	0.07 U	0.097 U	0.06 U	0.57 U	0.12 U	0.065 U	0.068 U	0.097 U	0.066 U	0.069 U	1.8 UJ	0.062 U	0.072 U	47 UJ	0.064 U	6.5 UJ	0.063 U
Acenaphthene	mg/kg	20	500	- -	0.82 UJ	0.054 U	0.17 J	0.06 U	0.33 J	0.43 J [0.43 U]	0.093 U	0.4 J	0.062 J	0.083 U	0.051 U	0.48 U	0.1 U	0.055 U	0.27 J	0.65	0.057 U	0.059 U	6.2 DJ	0.053 U	0.061 U	**100 DJ**	0.055 U	**58 DJ**	0.054 U
Acenaphthylene	mg/kg	100	500	- -	0.8 DJ	0.044 U	0.25 J	0.048 U	0.93	1.5 J [0.5 J]	0.075 U	0.32 J	0.048 U	0.068 U	0.042 U	1 J	0.084 U	0.045 U	0.13 J	0.58	0.046 U	0.048 U	9.9 DJ	0.043 U	0.05 U	**780 DJ**	0.044 U	29 DJ	0.044 U
Anthracene	mg/kg	100	500	- -	4.4 DJ	0.045 U	1.4	0.05 U	0.43 J	7.5 [2.3 J]	0.077 U	1	0.05 U	0.11 J	0.043 U	3 J	0.086 U	0.12 J	1.1	0.99	0.047 U	0.049 U	6.7 DJ	0.044 U	0.051 U	**820 DJ**	0.046 U	88 DJ	0.045 U
Benzo(a)anthracene	mg/kg	1	5.6	- -	**7.7 DJ**	0.0026 U	**3.7**	0.0029 U	**2**	**2.8 [2.8]**	0.051 J	**2**	0.15	0.37	0.0025 U	**6.8**	0.0049 U	0.37	1	**3**	0.0027 U	0.0028 U	**17 DJ**	0.0026 U	0.14	**680 DJ**	0.04	**120 DJ**	0.0026 U
Benzo(a)pyrene	mg/kg	1	1	- -	**6.5 DJ**	0.0026 U	**2.7**	0.0092 J	**1.5**	**2.4 [2.7]**	0.0045 U	**1.8 J**	0.19	0.35	0.0025 U	**4.7**	0.005 U	0.37	0.99	**3.5**	0.0028 U	0.0029 U	**17 DJ**	0.0026 U	0.17	**630 DJ**	0.031 J	**110 DJ**	0.0026 U
Benzo(b)fluoranthene	mg/kg	1	5.6	- -	**6.2 DJ**	0.0023 U	**2.1**	0.0026 U	**2.1**	**2.1 [1.9]**	0.004 U	**2.2 J**	0.19	0.32	0.0022 U	**5.9**	0.0045 U	0.4	0.92	**2.7**	0.0025 U	0.0026 U	**17 DJ**	0.0023 U	0.13	**470 DJ**	0.029 J	**94 DJ**	0.0023 U
Benzo(g,h,i)perylene	mg/kg	100	500	- -	6 DJ	0.028 U	2.4	0.03 U	1.4	1.6 J [1.8 J]	0.047 U	1.8 J	0.19 J	0.25 J	0.026 U	4.8	0.052 U	0.36 J	0.65	2.7	0.029 U	0.03 U	9.4 DJ	0.027 U	0.14 J	**280 DJ**	0.028 U	60 DJ	0.027 U
Benzo(k)fluoranthene	mg/kg	0.8	56	- -	**2.5 DJ**	0.0028 U	**0.93**	0.0031 U	0.76	**1.2 [0.76]**	0.0048 U	**0.94**	0.087	0.17	0.0027 U	**2.4**	0.0054 U	0.16	0.34	**1.1**	0.003 U	0.0031 U	**8.5 DJ**	0.0028 U	0.076	**150 DJ**	0.011 J	**31 DJ**	0.0028 U
bis(2-Ethylhexyl)phthalate	mg/kg	- -	- -	50	1.9 UJ	0.12 U	0.2 U	0.14 U	0.18 U	0.89 U [0.97 U]	0.21 U	0.14 U	0.14 U	0.19 U	0.12 U	1.1 U	0.23 U	0.13 U	0.13 U	0.19 U	0.13 U	0.14 U	3.5 UJ	0.12 U	0.14 U	91 UJ	0.12 J	13 UJ	0.12 U
Butylbenzylphthalate	mg/kg	- -	- -	- -	0.51 UJ	0.034 U	0.056 U	0.038 U	0.05 U	0.25 U [0.27 U]	0.058 U	0.039 U	0.038 U	0.052 U	0.032 U	0.3 U	0.16 J	0.035 U	0.037 U	0.052 U	0.036 U	0.037 U	0.96 UJ	0.033 U	0.039 U	25 UJ	0.034 U	3.5 UJ	0.034 U
Carbazole	mg/kg	- -	- -	- -	0.89 DJ	0.044 U	0.35 J	0.048 U	0.064 U	0.43 J [0.47 J]	0.075 U	0.39 J	0.048 U	0.068 U	0.042 U	0.5 J	0.084 U	0.045 U	0.28 J	0.1 J	0.046 U	0.048 U	12 DJ	0.043 U	0.05 U	170 DJ	0.044 U	15 DJ	0.044 U
Chrysene	mg/kg	1	56	- -	**9.2 DJ**	0.043 U	**3.9**	0.048 U	**2**	**2.5 J [2.8 J]**	0.074 U	**2.2**	0.17 J	0.27 J	0.041 U	**7.1**	0.082 U	0.41	**1.1**	**3.3**	0.045 U	0.047 U	**15 DJ**	0.043 U	0.12 J	**710 DJ**	0.044 U	**130 DJ**	0.043 U
Dibenzo(a,h)anthracene	mg/kg	0.33	0.56	- -	**1.2 DJ**	0.0047 U	**0.54**	0.0052 U	**0.35**	**0.034 U [0.61]**	0.008 U	**0.51 J**	0.051	0.082	0.0045 U	**0.93**	0.0089 U	0.078	0.13	**0.49**	0.0049 U	0.0051 U	**2.3 DJ**	0.0046 U	0.0053 U	**70 DJ**	0.0047 U	**13 DJ**	0.0046 U
Dibenzofuran	mg/kg	7	350	- -	**7.5 DJ**	0.044 U	1.8	0.048 U	4.7	6.9 [6]	0.075 U	0.4 J	0.071 J	0.067 U	0.041 U	3.4	0.083 U	0.045 U	0.37 J	0.067 U	0.046 U	0.048 U	**8.6 DJ**	0.043 U	0.049 U	**270 DJ**	0.044 U	**27 DJ**	0.043 U
Fluoranthene	mg/kg	100	500	- -	9.2 DJ	0.05 U	3.9	0.055 U	2.7	5.9 [2 J]	0.085 U	3.4 J	0.28 J	0.51 J	0.047 U	12	0.094 U	0.6	2	4.8	0.052 U	0.054 U	20 DJ	0.049 U	0.18 J	**1,200 DJ**	0.071 J	**190 DJ**	0.049 U
Fluorene	mg/kg	30	500	- -	11 DJ	0.048 U	2	0.052 U	3.2	11 [9.8]	0.11 J	0.57	0.08 J	0.073 U	0.045 U	2.8 J	0.09 U	0.085 J	1.1	0.43 J	0.05 U	0.052 U	11 DJ	0.047 U	0.054 U	**830 DJ**	0.048 U	**130 DJ**	0.047 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	5.6	- -	**4.7 DJ**	0.0069 UJ	**2**	0.011 J	**1.4**	**1.8 [1.7]**	0.012 U	**1.8**	0.2	0.26	0.0066 U	**4.5**	0.013 U	0.29	**0.57**	**2**	0.0072 U	0.0076 U	**10 DJ**	0.0068 U	0.11	**280 DJ**	0.012 J	**51 DJ**	0.0068 U
Naphthalene	mg/kg	12	500	- -	**68 DJ**	0.043 U	9.7	0.37 J	6	**28 [26]**	1.4	0.45	3.7	0.066 U	0.041 U	**45**	0.082 U	0.057 J	3.3	0.52 J	0.045 U	0.047 U	**120 DJ**	0.042 U	0.051 J	**2,500 DJ**	0.043 U	**770 DJ**	0.043 U
Phenanthrene	mg/kg	100	500	- -	24 DJ	0.047 U	5.4	0.055 J	9.5	32 [12]	0.26 J	2.9	0.37 J	0.2 J	0.045 U	24	0.09 U	0.27 J	2.9	2.4	0.05 U	0.052 J	27 DJ	0.047 U	0.1 J	**3,300 DJ**	0.14 J	**480 DJ**	0.047 U
Pyrene	mg/kg	100	500	- -	11 DJ	0.031 U	4.9	0.034 U	2.2	5.8 [3]	0.075 J	3.2	0.36 J	0.66	0.03 U	12	0.059 U	0.67	2.2	6.4	0.033 U	0.034 U	20 DJ	0.031 U	0.28 J	**1,500 DJ**	0.087 J	**270 DJ**	0.031 J
Total PAHs	mg/kg	- -	- -	- -	176.8 J	ND	47.49 J	0.5062 J	38.2 J	109.53 J [74.07 J]	1.896 J	25.71 J	6.22 J	3.552 J	ND	143.13 J	ND	4.24 J	19.29 J	35.96 J	ND	0.052 J	335 J	ND	1.497 J	15,400 J	0.421 J	2,884 J	0.031 J
Inorganics																													
Aluminum	mg/kg	- -	- -	- -	7,740	14,800	1,530 J	21,600 J	1,080	271 [450]	10,100	10,600	16,700	16,300	1,390	1,090	13,800 J	8,250	15,200 J	18,000 J	4,960	3,660	11,200 J	11,200	4,490 J	720	15,600	920 J	12,400
Antimony	mg/kg	- -	- -	- -	28.3	0.68 J	30.3 J	0.43 UJ	23.1	17.6 [12.8]	3.4 J	1.1 J	0.93 J	0.68 U	0.46 J	23.2	0.79 UJ	0.42 U	0.77 J	0.7 UJ	0.46 U	0.49 U	0.73 J	0.38 U	0.6 J	0.4 U	0.42 U	0.39 UJ	0.45 U
Arsenic	mg/kg	13	16	- -	**37.2 J**	0.74 J	**49.1 J**	12.6 J	**49.5 J**	**36.9 [33.8]**	**25.4**	5.8 J	2.7	13	1.6	**74 J**	7.8 J	2.8 J	3.1 J	10.5 J	1.6	1.8	**28.4 J**	1.2	**26.5 J**	1.9	1.5	1.9 J	1.5
Barium	mg/kg	350	400	- -	38.8 J	122 J	33.7 J	32.4 J	29.4 J	11.5 J [39.9]	51.2	116 J	61.3	64.5	9 J	29 J	28.1 J	52.3 J	95.4 J	63.8 J	6.7 J	9.5 J	58.1 J	102	71.5 J	16.8	139 J	20.6 J	102
Beryllium	mg/kg	7.2	590	- -	0.059 J	0.32 J	0.055 J	0.63	0.039 U	0.041 U [0.042 U]	0.54 J	0.42 J	0.39 J	0.78	0.064 J	0.051 U	0.72 J	0.35 J	0.096 J	0.87	0.18 J	0.25 J	0.83	0.29 J	0.55	0.33 J	0.49 J	0.38 J	0.3 J
Cadmium	mg/kg	2.5	9.3	- -	0.36 J	0.07 U	1.7	0.069 J	0.32 J	**2.8 [0.88]**	0.15 J	0.3 J	0.14 J	0.25 J	0.056 U	0.45 J	0.2 J	0.16 J	0.15 J	0.21 J	0.09 J	0.077 U	0.47 J	0.085 J	0.28 J	0.074 J	0.078 J	0.062 UJ	0.076 J
Calcium	mg/kg	- -	- -	- -	547 J	638	4,120 J	342 J	872	548 J [544 J]	2,790	11,700	3,830	2,010	184 J	1,080	1,480	10,400	6,820	2,240	375 J	1,780	110,000	1,610	9,850	1,570	1,430 J	352 J	1,790
Chromium	mg/kg	- -	- -	- -	220 J	26.9 J	122 J	39.5 J	44.5 J	81.8 [175]	103	29.3 J	111	44.8	6.9	84.3 J	25.7 J	29.2 J	62.3 J	42.1 J	21.8	13.2	16.9 J	29.5	34.1 J	1.7	29.2	2.9 J	27.8
Cobalt	mg/kg	- -	- -	30	29.3 J	8.7 J	**48.5 J**	9.2 J	14.7 J	26 [19.5]	17.6	8.6 J	13.8	9.9	1.2 J	15.2 J	7.9 J	7.3 J	10 J	10.9 J	2.7 J	3.8 J	4.8 J	7.7	5.6 J	3.7 J	7.5	3 J	12.4
Copper	mg/kg	50	270	- -	**452 J**	33.3 J	**1,520 J**	19.3 J	**480 J**	**591 [483]**	**314**	**72.3 J**	**60.3**	36.4	3.9	**436 J**	10.1 J	**53.6 J**	**67.9**	32.5 J	5.9	5.6	49.1 J	25.7	43 J	19.4	28.9	10.6 J	45.7
Cyanide	mg/kg	27	27	- -	**124**	0.56	**425**	1.2	**542**	**2,080 [149]**	21.5	**43.5**	0.067 U	0.46 J	5.3	**605**	6.3	1.5	0.065 U	0.52 J	0.25 J	0.32 J	19.2	0.79	3.2	5.2	0.3 J	**32.7**	2
Cyanide, Free	mg/kg	- -	- -	- -	9	0.12 UB	8.8	0.7	61.9	35.8 [11.4]	1.3	0.14 UB	3.5	1.1	0.49	122	3.8	0.12 UB	0.13 U	0.6 J	0.79	0.56	0.91	0.12 U	2.1	0.89	0.12 U	1.8	0.51
Iron	mg/kg	- -	- -	2,000	**136,000 J**	**24,800 J**	**131,000 J**	**18,200 J**	**25,100 J**	**49,400 [104,000]**	**129,000**	**25,000 J**	**17,700**	**34,900**	**42,000**	**56,900 J**	**44,000 J**	**13,700 J**	**28,700 J**	**42,500 J**	**7,920 J**	**14,900 J**	**11,700**	**17,200 J**	**19,300 J**	**2,220 J**	**18,800 J**	**2,920 J**	**20,300 J**
Lead	mg/kg	63	1,000	- -	**246**	6	**240 J**	10.8 J	**177**	**449 [173]**	**99.4**	**140**	**146**	**125**	3.9	**167**	10.7	43.8	21.9	**103**	2.8	5.4	33.2 J	4.4	59	10.7	5.7	22	5.6
Magnesium	mg/kg	- -	- -	- -	16.9 UB	5,150 J	2,430 J	3,950 J	697 J	166 J [91.4 J]	2,960	5,100 J	2,890	6,240	596	639 J	5,270 J	5,420 J	11,600 J	6,820 J	1,280	1,540	3,550 J	4,480	2,030 J	218 J	5,750	166 J	4,300
Manganese	mg/kg	1,600	10,000	- -	115 J	194 J	80.9 J	104 J	386 J	235 [212]	400	200 J	102	484	29.6	341 J	369 J	212 J	285 J	945 J	43.1	173	262 J	234	607 J	11.9	251	14.5 J	360
Mercury	mg/kg	0.18	2.8	- -	**1.8**	0.0033 J	**0.6**	0.023	**0.97 J**	**0.36 J [2.4 J]**	**0.52 J**	**0.5 J**	**0.2**	**1.4**	0.0028 J	**3**	0.0045 UB	0.067	**0.23 J**	**3.2**	0.0026 U	0.0025 U	**1.5**	0.0023 U	**0.6**	0.014 J	0.0024 U	**0.37**	0.0023 U
Nickel	mg/kg	30	310	- -	**351 J**	19.5 J	**631 J**	17.9 J	**72.7 J**	**165 [172]**	**151**	22.6 J	**129**	23.4	3.3	**77.6 J**	17.9 J	**56.4 J**	**41.7 J**	25.1 J	9.6	12.3	15.5 J	18.4	25.3 J	11.7	18.8	14.9 J	21.5
Potassium	mg/kg	- -	- -	- -	178 J	6,330 J	573 J	1,580 J	855 J	372 J [165 J]	1,900	3,420 J	1,600	3,390	2,120	762 J	2,960 J	1,420 J	14,100 J	3,530 J	510	628	1,600 J	4,340	715 J	89.8 J	4,570	219 J	3,530
Selenium	mg/kg	3.9	1,500	- -	2.8 J	0.78 UJ	1.8 J	0.97 J	2.3 J	1.1 U [1.1 UJ]	1.2 UJ	1.2 J	0.77 UJ	1.2 UJ	0.63 UJ	**4.4 J**	1.4 UJ	0.75 UJ	0.87 UJ	1.2 UJ	0.82 U	0.86 U	2.9 J	0.67 U	0.83 J	0.71 U	0.75 U	0.87 J	0.8 U
Silver	mg/kg	2	1,500	- -	0.16 U	0.12 U	0.19 U	0.11 U	0.16 U	0.16 U [0.21 J]	0.39 J	0.13 U	0.11 U	0.18 U	0.094 U	0.21 U	0.21 UJ	0.11 U	0.13 UJ	0.19 UJ	0.12 U	0.13 U	0.16 UJ	0.1 U	0.11 UJ	0.11 U	0.11 U	0.1 UJ	0.12 U
Sodium	mg/kg	- -	- -	- -	87.9 J	118 J	11.1 UB	6.6 UB	59.4 J	40.1 J [37.7 J]	203 J	186 J	122 J	329 J	156 J	256 J	12 UB	160 J	7.5 UB	10.8 UB	139 J	117 J	9.4 UB	89.4 J	6.6 UB	71.2 J	106 J	6 UB	130 J
Thallium	mg/kg	- -	- -	- -	0.49 U	0.89 J	1.6 J	0.56 J	0.49 U	0.52 UJ [0.53 U]	0.86 J	0.4 U	0.36 U	0.57 U	0.3 U	0.65 U	0.66 U	0.36 U	1.9 J	0.64 J	0.39 U	0.41 U	1.3 J	0.6 J	0.36 U	0.33 U	0.35 U	0.33 U	0.37 U
Vanadium	mg/kg	- -	- -	100	40.5 J	36.5 J	66.7 J	47.9 J	32.7 J	**90 [112]**	43.3	44.9 J	167	44	9.1	52.9 J	39.7 J	**101 J**	75.3 J	47.3 J	10.1	11.8	25.7 J	29.8	59 J	11.9	32.3	35.1 J	36.2
Zinc	mg/kg	109	10,000	- -	**470**	54.7	**770**	41.4 J	**184**	**99.5 [298]**	103	**177**	89.1	99	7.6	87.4	61 J	65.1	**115 J**	97.4 J	17.1	17.6	**152 J**	39.8	**118 J**	10.3	39.9	14.1 J	37
Miscellaneous																													
Alkalinity	mg/kg	- -	- -	- -	34 U	22.5 U	37.3 U	24.8 U	NA	32.4 U	38.4 U	NA	NA	NA	21.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia Nitrogen	ug/L	- -	- -	- -	5,700 J	2,100 J	NA	3,800 J	NA	NA	NA	NA	NA	NA	570	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	mg/kg	- -	- -	- -	39.7 J	22.1 U	37.3 U	24.4 U	NA	31.8 U [35.6 U]	171 J	NA	NA	NA	21.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Corrosivity	SU	- -	- -	- -	NA	4.14 J	5.17 J	3.88 J	4.22 J	4.96 J [2.43 J]	NA	4.4 J	5.44 J	4.27 J	3.8 J	5.1 J	3.75 J	6.86 J	6.41 J	3.88 J	4.18 J	6.21 J	7.65 J	7.8 J	7.62 J	7.47 J	7.72 J	7.32 J	7.35 J
Fluoride	mg/kg	- -	- -	- -	R	R	7.5 U	4.9 U	NA	12.7 U [7.1 U]	16.3 J	NA	NA	NA	4.3 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	- -	- -	- -	58.8	88.9	53.6	80.5	60.6	61.6 [56.6]	52.1	76.7	80.5	57.9	93.7	49.8	46.8	86.8	82.6	58.1	84.9	81.4	63.1	90.3	78.6	90.9	88.3	86.3	89.6
pH	SU	- -	- -	- -	NA	4.14 J	5.17 J	3.88 J	4.22 J	4.96 J [2.43 J]	NA	4.4 J	5.44 J	4.27 J	3.8 J	5.1 J	3.75 J	6.86 J	6.41 J	3.88 J	4.18 J	6.21 J	7.65 J	7.8 J	7.62 J	7.47 J	7.72 J	7.32 J	7.35 J
Phosphorous	mg/kg	- -	- -	- -	702	549	NA	373	NA	116 [274]	395	NA	NA	NA	98.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus as PO_4	mg/kg	- -	- -	- -	2,150	1,680	NA	1,140	NA	354 [840]	1,210	NA	NA	NA	302	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/kg	- -	- -	- -	2,450	1,030	8,700	2,980	NA	8,400 [6,470]	30,000	NA	NA	NA	699	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	mg/kg	- -	- -	- -	3,750	3.6 U	NA	R	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons																													
Diesel Range Organics [C10-C28]	mg/kg	- -	- -	- -	840 J	1.1 UB	1,000 J	1.2 UB	NA	870 J [620 J]	190	NA	NA	NA	1.1 UB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2
Summary of Soil Sample Analytical Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Notes:

Constituents detected above Unrestricted Use SCO or CP-51 guidance values are bolded.
Constituents detected above Restricted Use SCO are shaded and bolded.
Constituents that were not detected but the method detection limit exceeded the Restricted Use SCO/Unrestricted Use SCO/CP-51 guidance values are shaded.
1. Samples that were not detected are reported at the method detection limit.
2. Qualifiers are as follows:

J	=	Result is less than the reporting limit but greater than or equal to the method detection limit.
ND	=	None detected. This applies to summations where there were no detects for all individual constituents.
R	=	The value was rejected during data validation.
U	=	The compound was analyzed for but not detected. The associated value is the method detection limit.
D	=	Sample results are obtained from a dilution.
B	=	Compound was found in the blank and sample.
H	=	Sample was prepped or analyzed beyond the specified holding time.
HF	=	Field parameter with a holding time of 15 minutes.
*	=	Recovery or relative percent difference exceeds control limits.

3. Unrestricted Use SCO from Table 375-6.8(a) of the NYSDEC (2006) Remedial Program Soil Cleanup Objectives.
4. Restricted Use SCO from Table 375-6.8(b) of the NYSDEC (2006) Remedial Program Soil Cleanup Objectives.
5. CP-15 Guidance Values from Table 1 of the NYDEC (2010) CP-15/Soil Cleanup Guidance.
6. Results for duplicate samples are presented in brackets.
7. Non-detected analyses are not shown.

BTEX	=	benzene, toluene, ethylbenzene, and xylenes
mg/kg	=	milligram/kilogram
MGP	=	manufactured gas plant
NYSDEC	=	New York State Department of Environmental Conservation
NA	=	not analyzed
PAH	=	polycyclic aromatic hydrocarbon
PCB	=	polychlorinated biphenyl
SCO	=	soil cleanup objective
SU	=	standard unit
VOC	=	volatile organic compound
%	=	percent
Total PAHs	=	the summation of the 17 Target Analyte List PAHs. Non-detects were taken as zero.
Total PCBs	=	the summation of all detected PCBs. Non-detects were taken as zero.
Total VOCs	=	the summation of all detected VOCs. Non-detects were taken as zero.
Total BTEX	=	the summation of detected values for benzene, toluene, ethylbenzene and xylenes. Non-detects were taken as zero.
--	=	not sampled.

Table 3
Summary of Groundwater Sample Analytical Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Location ID: / Date Collected:	Units	Groundwater Standard	MW-K1 11/14/12	MW-K2 11/15/12	MW-K3 11/15/12	MW-K6 11/14/12
Volatile Organics						
Acetone	ug/L	50	**610 J**	4,000 U	400 U	22 J
Benzene	ug/L	1	**95 J**	750 U	75 U	**1,100**
Carbon Disulfide	ug/L	60	**16,000**	**100,000 B**	**14,000 B**	2.2 U
Ethylbenzene	ug/L	5	66 U	790 U	79 U	**360**
Isopropylbenzene	ug/L	5	62 U	750 U	75 U	**26**
Toluene	ug/L	5	62 U	750 U	75 U	**23**
Xylenes (total)	ug/L	5	62 U	750 U	75 U	**200**
Total BTEX	ug/L	- -	95 J	ND	ND	1,683
Total VOCs	ug/L	- -	16,705 J	100,000	14,000	1,731 J
Semivolatile Organics						
2,4-Dimethylphenol	ug/L	1	17 U	34 U	**14 J**	87 U
2-Methylnaphthalene	ug/L	- -	34 J	59 JD	9.2 J	340 D
2-Methylphenol	ug/L	- -	9 U	18 U	6.9 J	46 U
3 & 4 Methylpheno	ug/L	- -	22 J	49 JD	22	41 U
Acenaphthene	ug/L	20	14 U	27 U	5.4 U	**150 JD**
Dibenzo(a,h)anthracene	ug/L	- -	0.45 U	0.9 U	0.18 U	27 D
Dibenzofuran	ug/L	- -	14 U	49 JD	5.6 U	71 U
Fluorene	ug/L	50	14 U	**58 JD**	5.6 U	71 U
Indeno(1,2,3-cd)pyrene	ug/L	0.002	0.75 U	1.5 U	0.3 U	**43 D**
Naphthalene	ug/L	10	**590**	**1,800 D**	**380**	**2,900 D**
Phenanthrene	ug/L	50	16 U	**53 JD**	6.2 U	**80 JD**
Phenol	ug/L	1	**7.7 J**	8.1 U	1.6 U	21 U
Total Phenols	ug/L	1	**7.7J**	**49 J**	**42.9 J**	ND
Total Phenols, unchlorinated	ug/L	1	**7.7J**	**49 J**	**42.9J**	ND
Total PAHs	ug/L	- -	624 J	1,970 J	389.2 J	3,540 J
Inorganics						
Aluminum	ug/L	- -	56,200	97,600	54,500	7,370
Antimony	ug/L	3	**18.4 J**	**28.2 J**	**26.3 J**	5.3 U
Arsenic	ug/L	25	4.3 U	7.6 J	4.3 U	**31.1**
Barium	ug/L	1,000	20.9 J	26.6 J	13.5 J	204
Beryllium	ug/L	3	**3.9 J**	**8.4**	**5.1**	0.27 J
Calcium	ug/L	- -	171,000	457,000	472,000	177,000
Chromium	ug/L	50	**824**	**2,480**	**454**	17.5
Cobalt	ug/L	- -	3 J	5.5 J	91.2	11 J
Copper	ug/L	200	7.8 J	14.8 J	46.8	20.4 J
Cyanide	ug/L	200	**240**	**1,400**	**450**	**1,100**
Cyanide, Amenable	ug/L	- -	93	1,100	270	150
Cyanide, Free	ug/L	- -	14.8	211	44.4 J	0.54 U
Iron	ug/L	300	**865,000**	**1,850,000**	**1,640,000**	**20,700**
Lead	ug/L	25	**36.3**	**79.3**	**76.3**	18.7
Magnesium	ug/L	35,000	**35,300**	33,300	**156,000**	**39,100**
Manganese	ug/L	300	**4,820**	**5,740**	**12,200**	**2,000**
Mercury	ug/L	0.7	0.06 U	0.06 U	0.11 J	0.06 U
Nickel	ug/L	100	37.4 J	**175**	**223**	15.8 J
Potassium	ug/L	- -	15,200	19,100	25,600	13,500
Selenium	ug/L	10	**78.7**	**137**	**121**	7.9 U
Silver	ug/L	50	2.6 U	13 U	13 U	1.3 U
Sodium	ug/L	20,000	**36,000**	**28,100**	**487,000**	**24,500**
Thallium	ug/L	0.5	**11.9 J**	**28.5**	**14.6 J**	6.8 U
Vanadium	ug/L	- -	18.7 J	1.8 J	54	20.2 J
Zinc	ug/L	2,000	**2,650**	**7,760**	1,010	33.3
Miscellaneous						
Alkalinity	ug/L	- -	5,000 U	5,000 U	5,000 U	885,000
Ammonia Nitrogen	ug/L	- -	50,200	77,500	54,400	13,200
Bicarbonate Alkalinity as $CaCO_3$	ug/L	- -	5,000 U	5,000 U	5,000 U	885,000
Chloride	ug/L	- -	78,100 J	27,500 J	1,030,000	NA
Cyanide, Amenable	ug/L	- -	93	1,100	270	150
Fluoride	ug/L	- -	14,100 J	4,000 U*	1,200 J	NA
pH	SU	- -	1.64 HF	1.18 HF	2.7 HF	7.06 HF
Phosphorous	ug/L	- -	4,600	16,200	530	420
Phosphorus as PO_4	ug/L	- -	14,100 B	49,700 B	1,600 B	1,300 B
Sulfate	ug/L	- -	5,640,000	12,400,000	6,270,000	NA
Sulfide	ug/L	- -	89,600	6,300 U	630 U	630 U
Total Petroleum Hydrocarbons						
Diesel Range Organics [C10-C28]	ug/L	- -	2,500 B	3,700	2,100 [2,000]	NA

Table 3
Summary of Groundwater Sample Analytical Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Notes:

Constituents that exceeded the Groundwater Quality Standard but were not detected are shaded.
Constituents detected above the Groundwater Quality Standard are bolded.
1. Samples that were not detected are reported at the method detection limit.
2. Qualifiers are as follows:

J	=	Result is less than the reporting limit but greater than or equal to the method detection limit.
ND	=	None detected. This applies to summations where there were no detects for all individual constituents.
R	=	The value was rejected during data validation.
U	=	The compound was analyzed for but not detected. The associated value is the method detection limit.
D	=	Sample results are obtained from a dilution.
B	=	Compound was found in the blank and sample.
H	=	Sample was prepped or analyzed beyond the specified holding time.
HF	=	Field parameter with a holding time of 15 minutes.
*	=	Recovery or relative percent difference exceeds control limits.

3. Groundwater Quality Standards from Technical and Operational Guidance Series (TOGS), New York State Ambient Water Quality Standards and Guidance Values (June 1998), Part 703.5, Table 1.
4. Results for duplicate samples are presented in brackets.
5. Non-detected analyses are not shown.

BTEX	=	benzene, toluene, ethylbenzene, and xylenes
ug/L	=	microgram/liter
MGP	=	manufactured gas plant
NYSDEC	=	New York State Department of Environmental Conservation
NA	=	not analyzed
PAH	=	polycyclic aromatic hydrocarbon
PCB	=	polychlorinated biphenyl
SU	=	standard unit
%	=	percent
Total PAHs	=	the summation of the 17 Target Analyte List PAHs. Non-detects were taken as zero.
Total PCBs	=	the summation of all detected PCBs. Non-detects were taken as zero.
Total VOCs	=	the summation of all detected VOCs. Non-detects were taken as zero.
Total BTEX	=	the summation of detected values for benzene, toluene, ethylbenzene and xylenes. Non-detects were taken as zero.

Table 4
Summary of Storm Water Sample Analytical Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Location ID: / Date Collected:	Units	I-111 06/20/12	I-112 06/20/12	I-120 06/20/12	OF-1 06/20/12
Volatile Organics					
1,2,4-Trichlorobenzene	ug/L	1,200 J	110 U	400 U	400 U [400 U]
1,2-Dibromo-3-chloropropane	ug/L	1,300 J	140 U	480 U	480 U [480 U]
Benzene	ug/L	370 U	130 J	370 U	370 U [370 U]
Carbon Disulfide	ug/L	43,000	43,000	33,000 J	33,000 [30,000]
Total VOCs	ug/L	45,500 J	43,130 J	33,000 J	33,000 [30,460 J]
Total BTEX	ug/L	ND	130 J	ND	ND [ND]
Semivolatile Organics					
2,4-Dimethylphenol	ug/L	43 DJ	68 UJ	38 DJ	24 DJ [19 U]
2-Methylnaphthalene	ug/L	72 DJ	86 DJ	67 DJ	43 DJ [31 J]
2-Methylphenol	ug/L	25 DJ	36 UJ	24 DJ	16 DJ [13 J]
3 & 4 Methylphenol	ug/L	16 UJ	32 UJ	16 UJ	8 U [43 J]
Dibenzofuran	ug/L	32 DJ	56 UJ	32 DJ	22 DJ [16 J]
Fluorene	ug/L	48 DJ	70 DJ	45 DJ	33 DJ [24 J]
Naphthalene	ug/L	1,200 DJ	1,700 DJ	1,100 DJ	660 D [510]
Phenol	ug/L	18 DJ	17 DJ	18 DJ	14 DJ [16 J]
Total Phenols	ug/L	86 J	17 J	80 J	30 J [29 J]
Total Phenols, unchlorinated	ug/L	86 J	17 J	80 J	30 J [29 J]
Total PAHs	ug/L	1,320 J	1,856 J	1,212 J	754 J [565 J]
Inorganics					
Aluminum	ug/L	74,200	76,300	73,100	71,900 [72,400]
Antimony	ug/L	25.1 J	21.7 J	22.6 J	26.1 J [24.2 J]
Arsenic	ug/L	14.9 J	8.9 J	13.8 J	13.1 J [20.1]
Barium	ug/L	14.4 J	20 J	21.2 J	16.3 J [13.6 J]
Beryllium	ug/L	7.1 J	7 J	7 J	6.9 J [7 J]
Calcium	ug/L	343,000	342,000	341,000	335,000 [336,000]
Chromium	ug/L	2,280	2,390	2,220	2,190 [2,220]
Cobalt	ug/L	14.6 J	12.8 J	14 J	14.4 J [13.5 J]
Copper	ug/L	8.8 J	8.3 J	9.6 J	9.4 J [8.9 J]
Cyanide	ug/L	760	590	760	770 [670]
Cyanide, Free	ug/L	642	480	640	961 [810]
Iron	ug/L	1,450,000	1,430,000	1,440,000	1,410,000 [1,430,000]
Lead	ug/L	63.6	26.8	65.2	64 [61]
Magnesium	ug/L	29,100	28,200	29,100	28,700 [28,500]
Manganese	ug/L	5,270	5,260	5,140	5,070 [5,130]
Mercury	ug/L	0.06 U	0.06 U	0.06 U	0.075 J [0.06 U]
Nickel	ug/L	120	102	121	119 [120]
Potassium	ug/L	19,200	18,000	19,200	18,600 [18,900]
Sodium	ug/L	47,300	49,800	47,200	[46,300]
Thallium	ug/L	14.4 J	16 J	22.4 J	18.3 J [19.7 J]
Vanadium	ug/L	29.6 J	16.8 J	28.6 J	28.1 J [28.3 J]
Zinc	ug/L	2,750	2,430	2,690	2,630 [2,650]
Miscellaneous					
Ammonia Nitrogen	ug/L	87,800	86,700	83,100	93,300 [82,600]
Chloride	ug/L	71,500	76,600	71,900	69,900 [70,600]
pH	SU	1.38 J	1.44 J	1.39 J	1.38 J [1.38 J]
Phosphorous	ug/L	16,800	23,300	16,600	16,800 [16,600]
Phosphorus as PO4	ug/L	51,400	71,300	50,800	51,700 [51,000]
Sulfate	ug/L	7,600,000	7,080,000	7,620,000	7,540,000 [7,510,000]
Sulfide	ug/L	1,500 J	3,300 J	9,600 J	710 J [1,500 J]
Total Petroleum Hydrocarbons					
Diesel Range Organics [C10-C28]	ug/L	4,000 J	4,100 J	4,300 J	4,400 J [4,300 J]

Table 4
Summary of Storm Water Sample Analytical Results

Pre-Design Investigation Report
Consolidated Edison Company of New York, Inc.
Krasdale Leasehold - Hunts Point Former MGP
Bronx, New York

Notes:

Constituents detected are shaded.

1. Samples that were not detected are reported at the method detection limit.
2. Qualifiers are as follows:

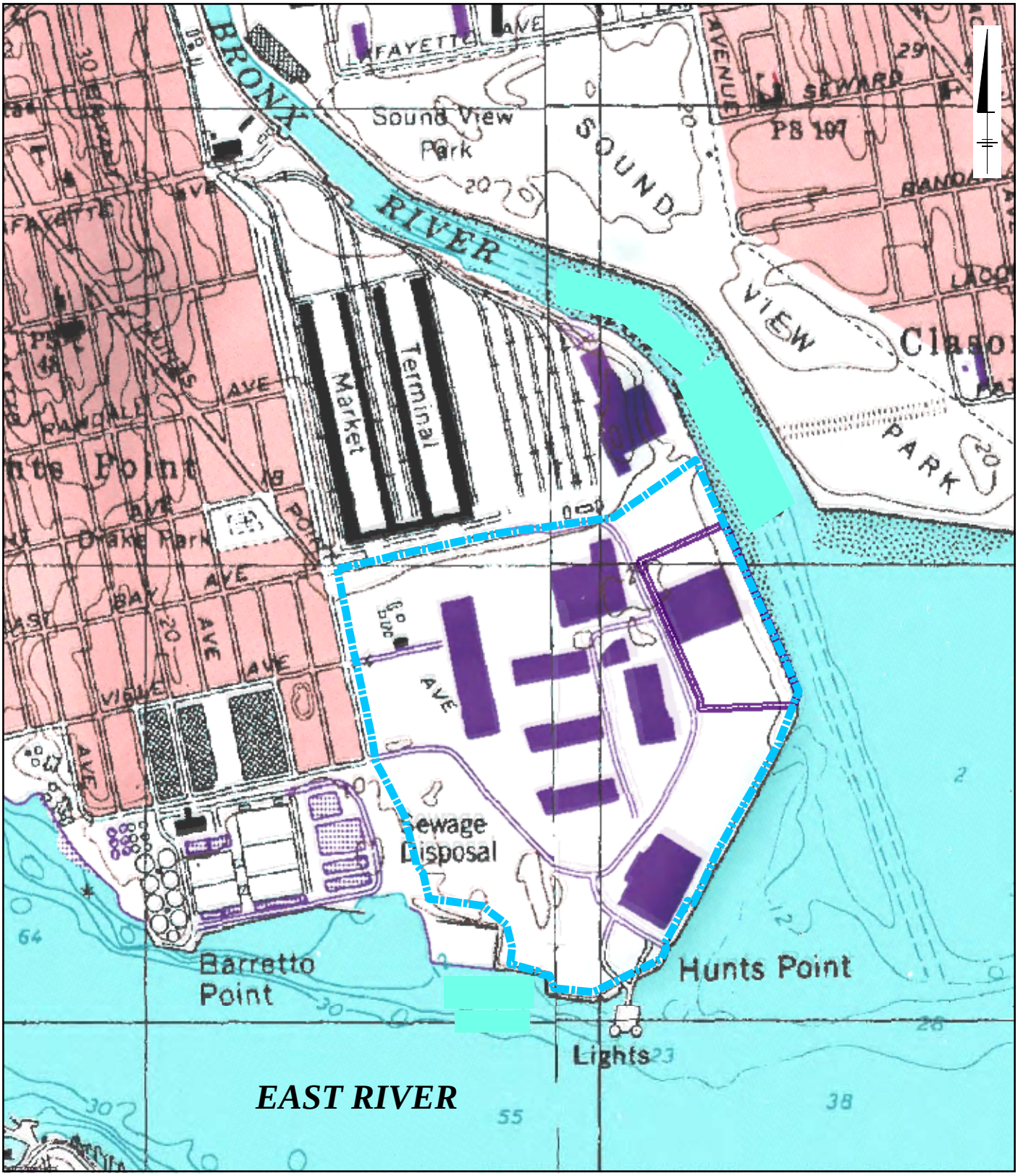
J	=	Result is less than the reporting limit but greater than or equal to the method detection limit.
ND	=	None detected. This applies to summations where there were no detects for all individual constituents.
R	=	The value was rejected during data validation.
U	=	The compound was analyzed for but not detected. The associated value is the method detection limit.
D	=	Sample results are obtained from a dilution.
B	=	Compound was found in the blank and sample.
H	=	Sample was prepped or analyzed beyond the specified holding time.
HF	=	Field parameter with a holding time of 15 minutes.
*	=	Recovery or relative percent difference exceeds control limits.

3. Results for duplicate samples are presented in brackets.
5. Non-detected analyses are not shown.

mg/L	=	milligram/liter
MGP	=	manufactured gas plant
PCB	=	polychlorinated biphenyl
SU	=	standard unit
ug/L	=	micrograms per liter
%	=	percent
Total PAHs	=	the summation of the 17 Target Analyte List PAHs. Non-detects were taken as zero.
Total PCBs	=	the summation of all detected PCBs. Non-detects were taken as zero.
Total VOCs	=	the summation of all detected VOCs. Non-detects were taken as zero.
Total BTEX	=	the summation of detected values for benzene, toluene, ethylbenzene and xylenes. Non-detects were taken as zero.

ARCADIS

Figures



LEGEND:

APPROXIMATE EXTENT OF FORMER MGP

SITE BOUNDARY (KRASDALE PROPERTY)

0 1,000 2,000 Feet

GRAPHIC SCALE

NOTE:

1. 1979 FLUSHING, N.Y. AND CENTRAL PARK, N.Y. - N.J. USGS QUADRANGLE.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

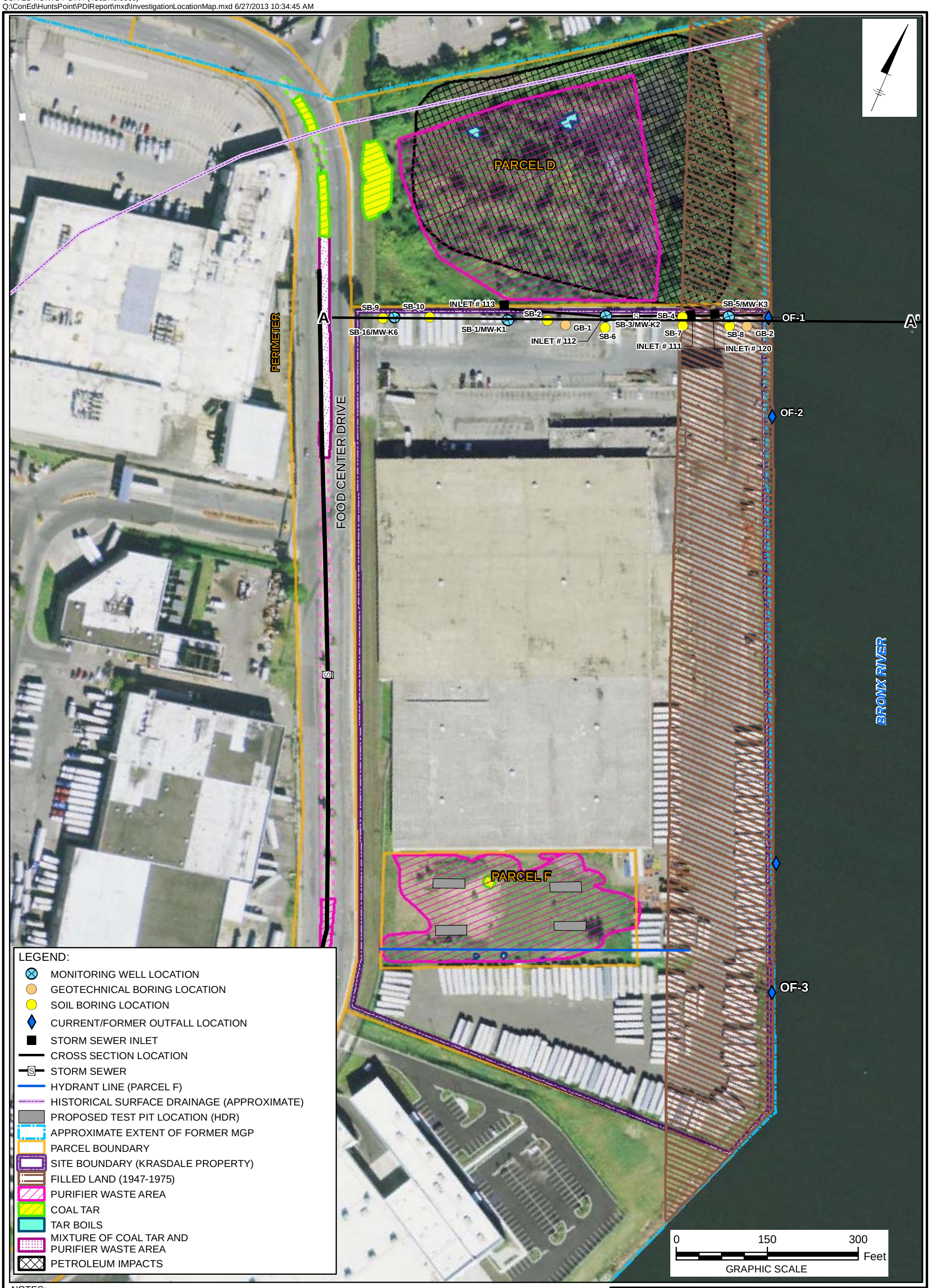
SITE LOCATION MAP

ARCADIS

FIGURE 1

City: SYR Div/Group: SWG Created By: J.RAPP Last Saved By: jrapp
Hunts Point (Project #)
Q:\ConEd\HuntsPoint\PDIReport\mxd\SiteLocationMap.mxd 5/3/2013 2:55:44 PM

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\InvestigationLocationMap.mxd 6/27/2013 10:34:45 AM



NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).

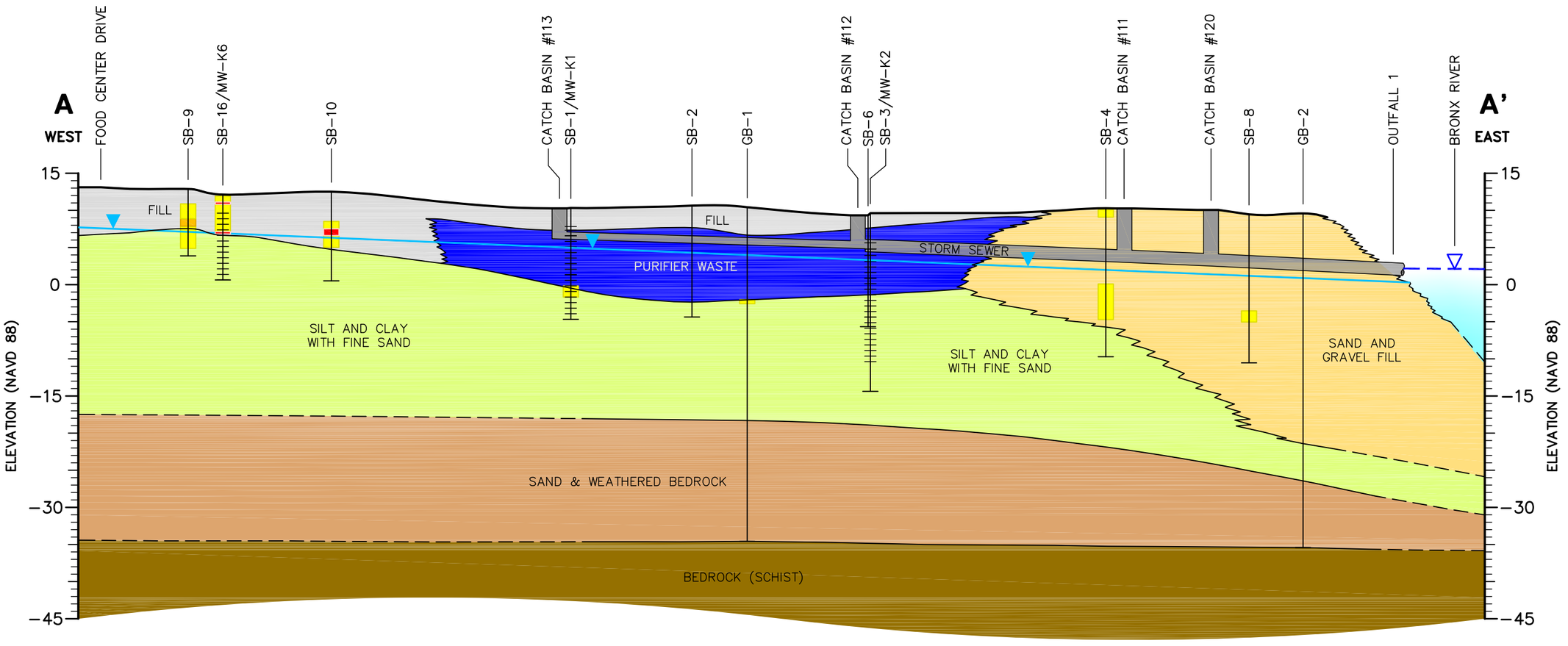
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

INVESTIGATION LOCATION MAP

ARCADIS

FIGURE
2



VERTICAL EXAGGERATION = 4X

0 15' 30'

VERTICAL SCALE

0 60' 120'

HORIZONTAL SCALE

LEGEND:

SB-10 — WELL OR BORING ID

GROUND SURFACE

GROUNDWATER

LITHOLOGIC CONTACT (DASHED WHERE INFERRED)

SCREEN

BOTTOM OF BORING

RIVER

FILL

SAND AND GRAVEL FILL

SILT AND CLAY WITH FINE SAND

SAND AND WEATHERED BEDROCK

BEDROCK

STAINING, ODOR

SHEEN

TAR SATURATED

PURIFIER WASTE/ODOR

NOTES:

1. COORDINATES ARE BASED ON NAD 83, NEW YORK LONG ISLAND STATE PLANE.
2. VERTICAL DATUM BASED ON NAVD 88.
3. BORING INFORMATION FOR GP-01 WAS OBTAINED FROM THE INVESTIGATIVE REPORT FOR PARCEL D, BRONX, NEW YORK, PREPARED BY LAWLER, MATUSKY & SKELLY ENGINEERING, LLP, OCTOBER 2005.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SEE FIGURE 2 FOR CROSS SECTION LOCATION.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT
PRE-DESIGN INVESTIGATION REPORT

CROSS-SECTION A-A'

ARCADIS

FIGURE 3

CITY:SYRACUSE, N.Y. DIV/GROUP:ENV/IM-DV DB:R. ALLEN LD:(Opt) PIC:(Opt) PM:J. BRIEN TM:(Opt) LYR:(Opt)On=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIB\043027\000\3\100000\DWG\PDI-RPT\43027V05.dwg LAYOUT: 3 SAVED: 5/13/2013 1:15 PM ACADVER: 18.1S (LMS TECH) PAGESETUP:
XREFS: IMAGES: PROJECTNAME: --
43027XBL

LEGEND:

VISUAL OBSERVATION:

- NO OBSERVED IMPACTS
- SHEEN
- STAINING AND ODOR
- PURIFIER WASTE AND ODOR
- TAR SATURATED; TAR STAURATED
- CURRENT/FORMER OUTFALL LOCATION
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA
- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)

0 200 400 Feet

GRAPHIC SCALE

SAMPLE LOCATION ID
DEPTHS OF IMPACTS OBSERVED IN FEET — **SB-25 3.5 - 5'**

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. VISUAL OBSERVATION DESCRIPTIONS AND COLORS SELECTED FROM NYSDEC MANUFACTURED GAS PLANT (MGP) COLOR CHART - JANUARY 20, 2012.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

VISUAL OBSERVATIONS

ARCADIS

FIGURE 4

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (B0043027.0003.09000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\SoilDataEvaluation_VisualObservations.mxd 5/6/2013 1:46:27 PM

VISUALLY IMPACTED SAMPLES

SAMPLES BELOW VISUAL IMPACTS

LEGEND:

TOTAL BTEX CONCENTRATION RANGE:

RESULTS IN mg/kg:

- ND
- < 1
- 1 - 10
- 10 - 200
- 200 - 500
- > 500

- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARENT AND DUPLICATE SAMPLES HAVE BEEN AVERAGED.
4. NON-DETECT VALUES ARE TAKEN AS ZERO.
5. UP TO 3 SAMPLES WERE COLLECTED FROM EACH SOIL BORING. AT LOCATIONS WITH ONLY ONE SAMPLE, RESULTS ARE PRESENTED ONLY ON THE "DEEP" PANEL. FOR LOCATIONS WITH 3 SAMPLES, THE TWO SHALLOWEST LOCATIONS ARE ON THE "SHALLOW" PANEL AND THE THIRD SAMPLE IS ON THE "DEEP" PANEL. LOCATIONS WITH TWO SAMPLES SHOW ONE SAMPLE ON EACH PANEL.
6. TOTAL BTEX EQUALS THE SUM OF BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES.

ABBREVIATIONS:

mg/kg = MILLIGRAMS PER KILOGRAM
ND = NOT DETECTED
BTEX = BENZENE, TOLUENE, ETHYLBENZEN and XYLENES

SAMPLE LOCATION ID
DEPTH OF SAMPLE IN FEET
SB-25
3.5 - 5'

0 200 400
Feet
GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

TOTAL BTEX CONCENTRATIONS IN SOIL

ARCADIS

FIGURE
5

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEdHuntsPoint\PDIReport\mxd\SoilDataEvaluation_TotalBTEX.mxd 5/3/2013 4:24:58 PM

VISUALLY IMPACTED SAMPLES

SAMPLES BELOW VISUAL IMPACTS

LEGEND:

CARBON DISULFIDE CONCENTRATION RANGE:
RESULTS IN (mg/kg):

- < 1
- 1 - 10
- 10 - 50
- 50 - 100
- > 100
- CURRENT/FORMER OUTFALL LOCATION

- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARENT AND DUPLICATE SAMPLES HAVE BEEN AVERAGED.
4. NON-DETECT VALUES ARE TAKEN AS ZERO.
5. UP TO 3 SAMPLES WERE COLLECTED FROM EACH SOIL BORING. AT LOCATIONS WITH ONLY ONE SAMPLE, RESULTS ARE PRESENTED ONLY ON THE "DEEP" PANEL. FOR LOCATIONS WITH 3 SAMPLES, THE TWO SHALLOWEST LOCATIONS ARE ON THE "SHALLOW" PANEL AND THE THIRD SAMPLE IS ON THE "DEEP" PANEL. LOCATIONS WITH TWO SAMPLES SHOW ONE SAMPLE ON EACH PANEL.
6. THE NYSDEC CP-51 SOIL CLEANUP GUIDANCE - SUPPLEMENTAL SOIL CLEANUP OBJECTIVE (SSCO) FOR CARBON DISULFIDE IS 100 PPM.

ABBREVIATIONS:

mg/kg = MILLIGRAMS PER KILOGRAM

SAMPLE LOCATION ID
DEPTH OF SAMPLE IN FEET — SB-25 3.5 - 5'

0 200 400 Feet
GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

CARBON DISULFIDE CONCENTRATIONS IN SOIL

ARCADIS

FIGURE 6

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEdHuntsPoint\PDIReport\mxd\SoilDataEvaluation_CarbDisulfide.mxd 5/3/2013 4:30:32 PM

VISUALLY IMPACTED SAMPLES

SAMPLES BELOW VISUAL IMPACTS

LEGEND:

TOTAL PAH CONCENTRATION RANGE:
RESULTS IN mg/kg:

- ND
- < 10
- 10 - 500
- 500 - 1,000
- 1,000 - 10,000
- > 10,000
- CURRENT/FORMER OUTFALL LOCATION

- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARENT AND DUPLICATE SAMPLES HAVE BEEN AVERAGED.
4. NON-DETECT VALUES ARE TAKEN AS ZERO.
5. UP TO 3 SAMPLES WERE COLLECTED FROM EACH SOIL BORING. AT LOCATIONS WITH ONLY ONE SAMPLE, RESULTS ARE PRESENTED ONLY ON THE "DEEP" PANEL. FOR LOCATIONS WITH 3 SAMPLES, THE TWO SHALLOWEST LOCATIONS ARE ON THE "SHALLOW" PANEL AND THE THIRD SAMPLE IS ON THE "DEEP" PANEL. LOCATIONS WITH TWO SAMPLES SHOW ONE SAMPLE ON EACH PANEL.
6. TOTAL PAHS EQUALS THE SUM OF THE 17 TARGET ANALYTE LIST PAHS.

ABBREVIATIONS:

mg/kg = MILLIGRAMS PER KILOGRAM
ND = NOT DETECTED
PAH = polycyclic aromatic hydrocarbon

SAMPLE LOCATION ID
DEPTH OF SAMPLE IN FEET
SB-25
3.5 - 5'

0 200 400 Feet
GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

TOTAL PAH CONCENTRATIONS IN SOIL

ARCADIS

FIGURE
7

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEdHuntsPoint\PDIReport\mxd\SoilDataEvaluation_TotalPah.mxd 5/3/2013 4:33:50 PM

VISUALLY IMPACTED SAMPLES

SAMPLES BELOW VISUAL IMPACTS

LEGEND:

CYANIDE CONCENTRATION RANGE:

RESULTS IN (mg/kg):

- ND
- < 27
- 27 - 150
- 150 - 1,000
- > 1,000

- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARENT AND DUPLICATE SAMPLES HAVE BEEN AVERAGED.
4. NON-DETECT VALUES ARE TAKEN AS ZERO.
5. UP TO 3 SAMPLES WERE COLLECTED FROM EACH SOIL BORING. AT LOCATIONS WITH ONLY ONE SAMPLE, RESULTS ARE PRESENTED ONLY ON THE "DEEP" PANEL. FOR LOCATIONS WITH 3 SAMPLES, THE TWO SHALLOWEST LOCATIONS ARE ON THE "SHALLOW" PANEL AND THE THIRD SAMPLE IS ON THE "DEEP" PANEL. LOCATIONS WITH TWO SAMPLES SHOW ONE SAMPLE ON EACH PANEL.

ABBREVIATIONS:

mg/kg = MILLIGRAMS PER KILOGRAM
ND = NOT DETECTED

SAMPLE LOCATION ID — **SB-25**
DEPTH OF SAMPLE IN FEET — **3.5 - 5'**

0 200 400 Feet

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

TOTAL CYANIDE CONCENTRATIONS IN SOIL

ARCADIS

FIGURE 8

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.3.10000)
Q:\ConEdHuntsPoint\PDIReport\mxd\SoilDataEvaluation_Cyanide.mxd 5/3/2013 4:36:07 PM

VISUALLY IMPACTED SAMPLES

SAMPLES BELOW VISUAL IMPACTS

LEGEND:

pH RANGE:

RESULTS IN (SU):

- NA
- < 4
- 4 - 5
- 5 - 6
- 6 - 7
- > 7
- CURRENT/FORMER OUTFALL LOCATION

- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- SHEEN
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA

NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARENT AND DUPLICATE SAMPLES HAVE BEEN AVERAGED.
4. NON-DETECT VALUES ARE TAKEN AS ZERO.
5. UP TO 3 SAMPLES WERE COLLECTED FROM EACH SOIL BORING. AT LOCATIONS WITH ONLY ONE SAMPLE, RESULTS ARE PRESENTED ONLY ON THE "DEEP" PANEL. FOR LOCATIONS WITH 3 SAMPLES, THE TWO SHALLOWEST LOCATIONS ARE ON THE "SHALLOW" PANEL AND THE THIRD SAMPLE IS ON THE "DEEP" PANEL. LOCATIONS WITH TWO SAMPLES SHOW ONE SAMPLE ON EACH PANEL.

ABBREVIATIONS:

SU = STANDARD UNIT
NA = NOT ANALYZED

SAMPLE LOCATION ID
DEPTH OF SAMPLE IN FEET — SB-25 3.5 - 5'

0 200 400 Feet

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

pH IN SOIL

ARCADIS

FIGURE 9

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEdHuntsPoint\PDIReport\mxd\SoilDataEvaluation_pH.mxd 5/3/2013 4:42:39 PM

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\GroundwaterDataEvaluation_VOCs.mxd 5/14/2013 11:45:54 AM

Groundwater Quality Standards	
Benzene	1 ug/L
Carbon Disulfide	60 ug/L
Ethylbenzene	5 ug/L
Toluene	5 ug/L
Xylenes (total)	5 ug/L

PARCEL D

MW-K3	
Carbon Disulfide	14,000 B ug/L
Total BTEX	ND
Total VOCs	14,000 ug/L

INLET # 120
INLET # 111
INLET # 113
INLET # 112
SB-4
OF-1

MW-K6	
Benzene	1,100 ug/L
Ethylbenzene	360 ug/L
Toluene	23 ug/L
Xylenes (total)	200 ug/L
Total BTEX	1,683 ug/L
Total VOCs	1,731 J ug/L

MW-K1	
Benzene	95 J ug/L
Carbon Disulfide	16,000 ug/L
Total BTEX	95 J ug/L
Total VOCs	16,705 J ug/L

MW-K2	
Carbon Disulfide	100,000 B ug/L
Total BTEX	ND
Total VOCs	100,000 ug/L

OF-2

PERIMETER
FOOD CENTER DRIVE
BRONX RIVER

PARCEL F

OF-3

LEGEND:
- MONITORING WELL LOCATION
- CURRENT/FORMER OUTFALL LOCATION
- STORM SEWER INLET
- STORM SEWER
- HYDRANT LINE (PARCEL F)
- HISTORICAL SURFACE DRAINAGE (APPROXIMATE)
- PROPOSED TEST PIT LOCATION (HDR)
- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- APPROXIMATE EXTENT OF FORMER MGP
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA
- PETROLEUM IMPACTS

Well ID	
Analyte Name	Result in ug/L

0 150 300
Feet
GRAPHIC SCALE

NOTES:
1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).
9. COMPOUNDS EXCEEDING THE GROUNDWATER QUALITY STANDARDS, TOTAL BTEX, AND TOTAL VOCS ARE PRESENTED

ABBREVIATIONS:
ND = NONE DETECTED
J = RESULT IS LESS THAN THE REPORTING LIMIT BUT GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT.
BTEX = BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
VOC = VOLITILE ORGANIC COMPOUNDS

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

VOCs IN GROUNDWATER

ARCADIS

FIGURE
10

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\GroundwaterDataEvaluation_SVOCs.mxd 5/14/2013 11:57:14 AM

Groundwater Quality Standards	
Acenaphthene	20 ug/L
Fluorene	50 ug/L
Indeno(1,2,3-cd)pyrene	0.002 ug/L
Naphthalene	10 ug/L
Phenanthrene	50 ug/L

PARCEL D

MW-K3	
Naphthalene	380 ug/L
Total PAHs	389.2 J ug/L

INLET # 120
INLET # 111
INLET # 113
INLET # 112
SB-4
OF-1

MW-K6	
Acenaphthene	150 JD ug/L
Indeno(1,2,3-cd)pyrene	43 D ug/L
Naphthalene	2,900 D ug/L
Phenanthrene	80 JD ug/L
Total PAHs	3,540 J ug/L

MW-K1	
Naphthalene	590 ug/L
Total PAHs	624 J ug/L

MW-K2	
Fluorene	58 JD ug/L
Naphthalene	1,800 D ug/L
Phenanthrene	53 JD ug/L
Total PAHs	1,970 J ug/L

OF-2
OF-3
PERIMETER
FOOD CENTER DRIVE
BRONX RIVER
PARCEL F

LEGEND:
- MONITORING WELL LOCATION
- CURRENT/FORMER OUTFALL LOCATION
- STORM SEWER INLET
- STORM SEWER
- HYDRANT LINE (PARCEL F)
- HISTORICAL SURFACE DRAINAGE (APPROXIMATE)
- PROPOSED TEST PIT LOCATION (HDR)
- PARCEL BOUNDARY
- SITE BOUNDARY (KRASDALE PROPERTY)
- APPROXIMATE EXTENT OF FORMER MGP
- FILLED LAND (1947-1975)
- PURIFIER WASTE AREA
- COAL TAR
- TAR BOILS
- MIXTURE OF COAL TAR AND PURIFIER WASTE AREA
- PETROLEUM IMPACTS

Well ID	
Analyte Name	Result in ug/L

0 150 300 Feet
GRAPHIC SCALE

NOTES:
1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).
9. COMPOUNDS EXCEEDING THE GROUNDWATER QUALITY STANDARDS, TOTAL BTEX, AND TOTAL VOCS ARE PRESENTED.

ABBREVIATIONS:

PAH = POLYCYCLIC AROMATIC HYDROCARBONS
ND = NONE DETECTED
J = RESULT IS LESS THAN THE REPORTING LIMIT BUT GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT.
D = SAMPLE RESULTS ARE OBTAINED FROM A DILUTION.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

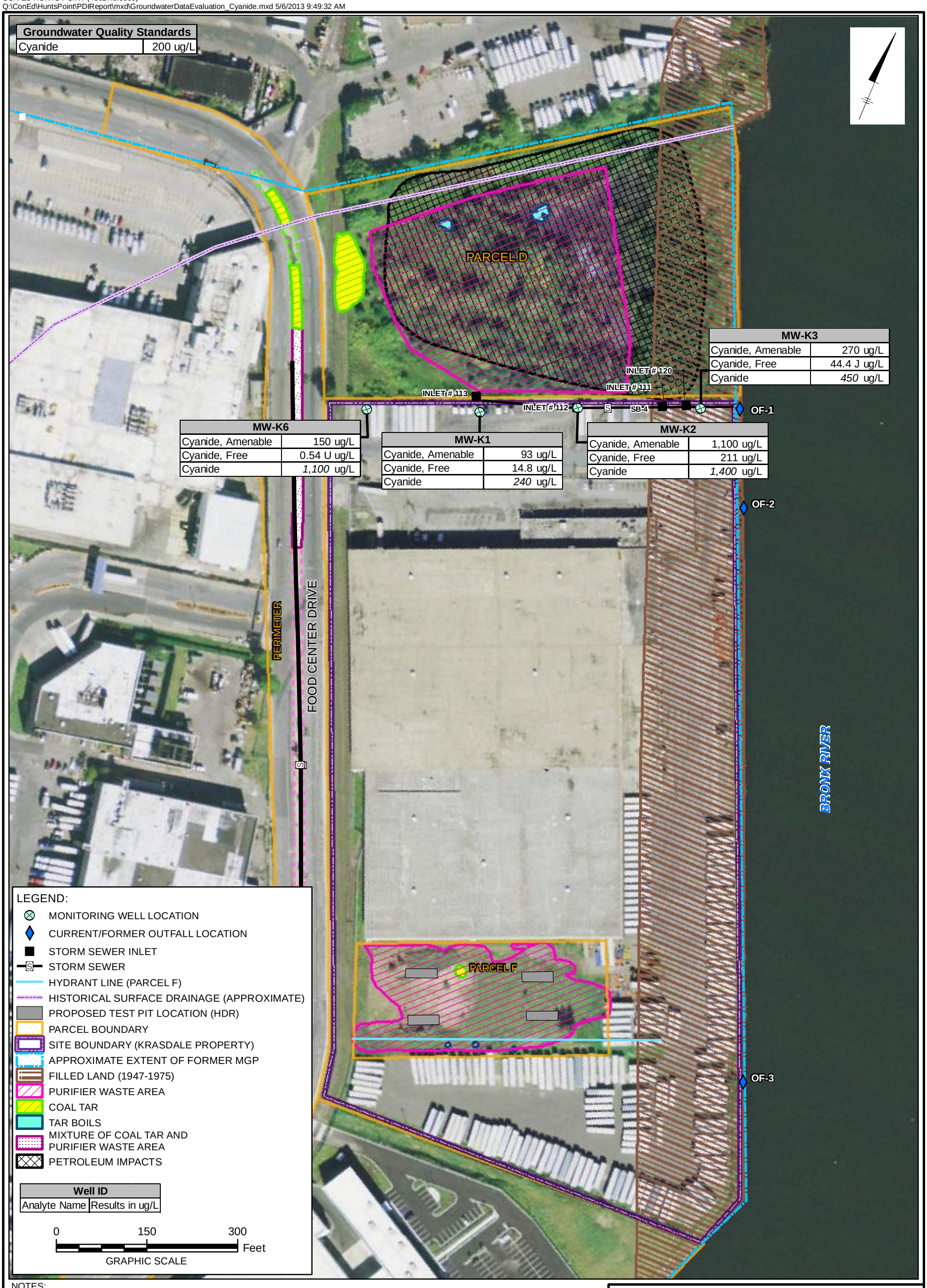
PRE-DESIGN INVESTIGATION REPORT

PAHs IN GROUNDWATER

ARCADIS

FIGURE
11

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\GroundwaterDataEvaluation_Cyanide.mxd 5/6/2013 9:49:32 AM



NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).
9. VALUES FOR AMENABLE CYANIDE, FREE CYANIDE, AND CYANIDE ARE PRESENTED. VALUES IN ITALICS EXCEED GROUNDWATER QUALITY STANDARDS.

ABBREVIATIONS:

J = RESULT IS LESS THAN THE REPORTING LIMIT BUT GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

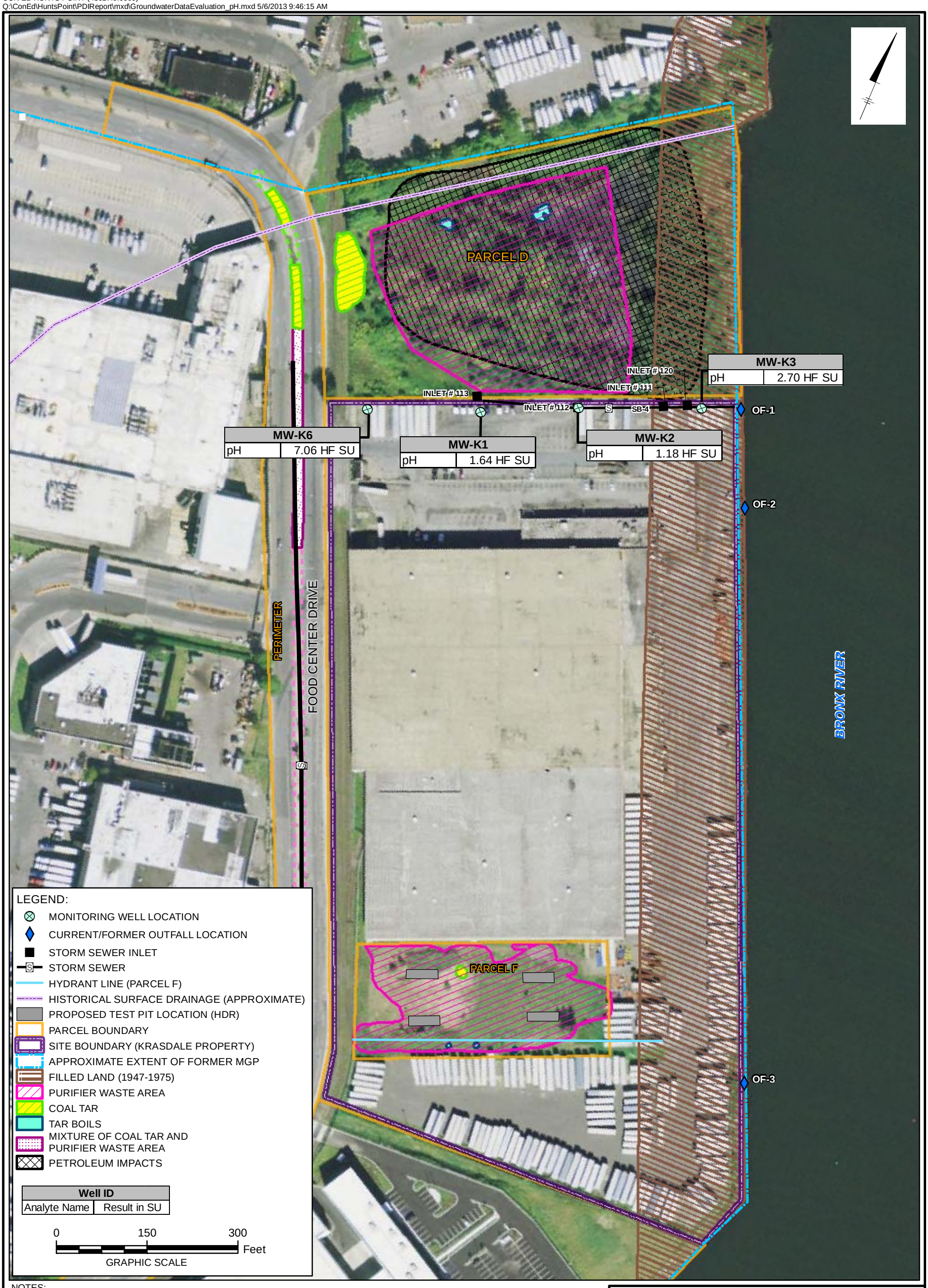
PRE-DESIGN INVESTIGATION REPORT

CYANIDE IN GROUNDWATER

ARCADIS

FIGURE
12

City:SYR Div/Group: SWG Created By:J.Rapp Last Saved By: jrapp
CON ED HUNTS POINT (43027.0.6000)
Q:\ConEd\HuntsPoint\PDIReport\mxd\GroundwaterDataEvaluation_pH.mxd 5/6/2013 9:46:15 AM



NOTES:

1. IMAGERY OBTAINED FROM DIGITAL GLOBE, SEPTEMBER 19, 2009.
2. ALL LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES ADOPTED FROM CADD FILE PREPARED BY LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP.
4. SITE CHARACTERIZATION DETAILS FOR PARCEL D AND ADJACENT PERIMETER PARCEL ADOPTED FROM INVESTIGATIVE REPORT FOR PARCEL D, LAWLER, MATUSKY, AND SKELLY ENGINEERS, LLP, REVISED OCTOBER 2005.
5. SITE CHARACTERIZATION DETAILS FOR PARCEL F ADOPTED FROM SITE INVESTIGATIVE REPORT FOR PARCEL F, HDR/LMS, NOVEMBER 2007, PRE-DESIGN INVESTIGATION SOW, HDR ,OCTOBER 2010, AND REVISED PERMANENT WELL LOCATIONS, HDR, OCTOBER 4, 2011.
6. COAL TAR AND PURIFIER WASTE ON PERIMETER PARCEL EXCAVATED DURING THE CONSTRUCTION OF THE IROQUOIS PIPELINE.
7. STORM SEWER LOCATION ON KRASDALE PROPERTY WAS DIGITIZED FROM 2008 MERCATOR TOPOGRAPHIC AND UTILITY SURVEY. STORM SEWER COMPONENTS ASSOCIATED WITH OF-2 AND OF-3 ARE NOT SHOWN.
8. HDR LOCATIONS WERE MAPPED BASED ON FIGURE X PROVIDED IN HDR'S REVISED PERMANENT WELL LOCATIONS MEMORANDUM (OCTOBER 17, 2011).

ABBREVIATIONS:

HF = FIELD PARAMETER WITH A HOLDING TIME OF 15 MINUTES
SU = STANDARD UNIT

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT

PRE-DESIGN INVESTIGATION REPORT

pH IN GROUNDWATER

ARCADIS

FIGURE
13

Appendix A

Boring Logs

Date Start/Finish: 6/13/12-6/18/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234289.3
Easting: 1019849.1
Casing Elevation: 10.32'

Borehole Depth: 15' bgs
Surface Elevation: 10.3

Descriptions By: J.Oliver/ M.Bell

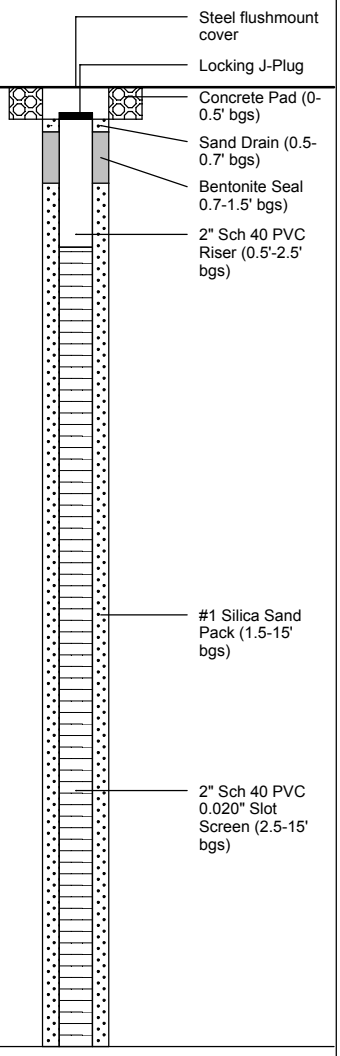
Well/Boring ID: **SB-01/MW-K1**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	10							
		1	0-5	NA	0.0			ASPHALT.
					0.0			Brown/Light brown fine to coarse SAND and fine subangular GRAVEL, loose, poorly sorted, moist.
					0.0			Light brown fine to medium SAND, trace fine Gravel, well sorted, moist.
					0.0			Brown fine SAND and fine subangular GRAVEL, loose, poorly sorted, moist to wet.
					785.0			Black fine SAND and SILT, some Wood chips/pulp, poorly sorted, odor, moist.
					0.0			Grey Clayey fine SAND, trace Silt, medium dense, none to slightly plastic, moist.
5	5				0.9			Grey-brown Silty CLAY, medium dense, moderately plastic, moist to wet.
		2	5-10	1.7	0.8			
					88.4			Black WOOD PULP and fine SAND, very loose, odor, wet.
					59.4			
					77.8			
10	0				150.8			Water pH at 10' bgs: 3.48
					176.4			Grey Silty CLAY, plastic, soft, odor, wet.
					10.9			Grey/brown CLAY, some Silt, trace fine Sand, odor, wet.
					9.8			
		3	10-15	4.0	0.9			Brown Clayey fine SAND, some Silt, very dense, moist.
					0.8			
					0.7			
					1.1			
					0.3			
15	-5							Water pH at 15' bgs: 4.40
								Boring terminated at 15' bgs.

Well/Boring Construction



ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 10-10.8'bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, Cyanide, TPH, Inorganics and 12-13' bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH, Inorganics

Hand Cleared to 5' bgs.

Date Start/Finish: 6/13/12-6/15/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234314.3
Easting: 1019909.3
Casing Elevation: NA

Borehole Depth: 15' bgs
Surface Elevation: 10.6

Descriptions By: J.Oliver/S.Manning

Well/Boring ID: **SB-02**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10.6				0.0			ASPHALT.	
				0.0			Brown fine to coarse SAND and fine to medium GRAVEL, loose, poorly sorted, moist.	
	1	0-5	NA	30.1			Grey-green WOOD fragments/chips, little fine Sand, odor, moist.	
				821.3			Green/dark green WOOD fragments/chips, trace fine to medium Sand, odor, moist to wet.	
5 / 5.6				2284			Grey/light green WOOD fragments/chips, trace Ash, odor, moist to wet.	
				3.4			Brown-tan Silty medium to coarse SAND, mica inclusions.	
				370			Blue-green WOOD pulp, some medium to coarse Sand, wet.	
				563			Black WOOD pulp, strong odor, wet.	
				212				
				60.1				
	2	5-10	2.0	818				Borehole backfilled with Portland cement grout to grade.
10 / 0.6							Water pH at 10' bgs: 2.63	
	3	10-15	2.3				Water pH at 13' bgs: 2.94	
				12.3			Tan-grey Silty CLAY, dense, plastic, moist.	
				8.1				
15 / -4.4							Boring terminated at 15' bgs.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from11.5-13.1 and 14-15 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH, Inorganics

Hand Cleared to 5' bgs.

Date Start/Finish: 6/14/12-6/21/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234357.8
Easting: 1019995.4
Casing Elevation: 9.63'

Borehole Depth: 24' bgs
Surface Elevation: 9.6

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-03/MW-K2**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0 / 10				0.0			ASPHALT.
				4.2			Brown to green fine to medium SAND and GRAVEL, trace Brick, Mica, loose, poorly sorted, moist.
				5.5			
				0.2			Brown to grey fine to medium SAND, little coarse Sand, trace Gravel, loose, poorly sorted, moist.
				1.2			Wood piece.
	1	0-5	NA	14.8			Dark grey fine to medium SAND, some coarse Sand, little Gravel, moist.
				16.2			
				20.7			
5 / 5				18.2			Grey to green WOOD fragments/chips, little fine Sand, odor, moist.
				32.2	X		Black WOOD fragments/chips, trace fine Sand, odor, wet. Green staining.
				50.7			Black/green-black WOOD pulp/chips, loose, odor, moist to wet @ 6.7 ' bgs.
				101			
				396			
				405			
				495			
	2	5-10	1.9				
0 / 10				1095	X		
				2415			
				318	X		Grey CLAY, little to trace Silt, trace Organics (roots/plants), plastic, medium soft, dense.
				305			
				285			
	3	10-15	1.7				
-5 / 15							Water pH at 15' bgs: 1.79 initial, 1.52 after 1 gal removed
	4	15-20	0.0				No Recovery.

Well/Boring Construction

- Steel flushmount cover
- Locking J-Plug
- Concrete Pad (0-0.5' bgs)
- Sand Drain (0.5-1' bgs)
- Bentonite Seal (1-3' bgs)
- 2" Sch 40 PVC Riser (0.5'-4.0' bgs)
- #1 Silica Sand Pack (3-20' bgs)
- 2" Sch 40 PVC 0.020" Slot Screen (4-20' bgs)

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4.5-5 ft bgs for VOCs, SVOCs, Metals, PCBs, pH, Cyanide. Samples were also collected from 10-10.9 ft for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH and Inorganics and from 10.9-11.7 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, Cyanide, TPH and Inorganics .

Client: ConEdison Inc.

Well/Boring ID: **SB-03/MW-K2**

Borehole Depth: 24' bgs

Site Location:
Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10 / 20	4	15-20	0.0				No Recovery.	#1 Silica Sand Pack (3-20' bgs)
							Water pH at 20' bgs: 3.28	
	5	20-24	0.0				No Recovery.	Boring collapsed at 20' bgs.
-15 / 25							Refusal at 24' bgs.	
-20 / 30								
-25 / 35								

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4.5-5 ft bgs for VOCs, SVOCs, Metals, PCBs, pH, Cyanide. Samples were also collected from 10-10.9 ft for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH and Inorganics and from 10.9-11.7 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, Cyanide, TPH and Inorganics .

Date Start/Finish: 6/14/12-6/21/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234405.4
Easting: 1020112.9
Casing Elevation: NA

Borehole Depth: 20' bgs
Surface Elevation: 10.3

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-04**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	10				0.0			Asphalt surface.	
					1.2			Brown to grey fine to medium SAND and GRAVEL, some Silt, poorly sorted, green and black staining.	
					1.4			COBBLE. Light green-blue staining.	
					0.0			Brown fine to medium SAND, some Gravel, loose, poorly sorted.	
		1	0-5	NA	0.0			Dark brown to grey fine to medium SAND, some Gravel, loose, poorly sorted, moist.	
					0.0			Light brown to grey fine to medium SAND, some coarse Sand, little Brick fragments, medium dense, poorly sorted, moist.	
					0.0			Grey fine to medium SAND, some medium to coarse Gravel, Brick fragments, dense, poorly sorted, moist. Cobbles.	
5	5				0.0			Brown Clayey fine SAND, trace fine Gravel, red Brick, medium dense, moist.	
					0.1				
					0.3			Black/dark grey fine SAND, little Silt, trace fine Gravel, Coal fragments, moist to wet @ 7' bgs.	
					1.1				
					1.4			Medium to coarse Sand lamination less than 0.1' thick	
		2	5-10	3.0	10.9				
					140			Red Brick between 7.6-8' bgs.	Borehole backfilled with Portland cement grout to grade.
10	0				150			Black medium to fine SAND, some Silt, trace Clay, dense, odor, wet.	
					355				
					405				
					10.1			Black medium to fine subangular GRAVEL, little to trace fine to coarse Sand, Silt, loose, wet.	
					20.0				
		3	10-15	3.0	8.9			Dark brown medium to fine SAND, trace Silt, odor, wet.	
					10.0				
15	-5				100			Black medium to coarse SAND, little fine Sand, trace Silt, dense, poorly sorted, wet.	
		4	15-20	3.6	110				

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 0-1,10.2-11.4 and 17.2-18.2 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide

Hand Cleared to 5' bgs.

Client: ConEdison Inc.

Well/Boring ID: **SB-04**

Borehole Depth: 20' bgs

Site Location:
Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
				118			Black medium to coarse SAND, little fine Sand, trace Silt, dense, poorly sorted, wet.	
				95.9				
				1.9				
	4	15-20	3.6	1.5			Dark grey/black CLAY, little to trace Silt, plastic, dense, moist to wet.	
				0.9				Borehole backfilled with Portland cement grout to grade.
20 -10							Boring terminated at 20' bgs.	
25 -15								
30 -20								
35								

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 0-1,10.2-11.4 and 17.2-18.2 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide

Hand Cleared to 5' bgs.

Date Start/Finish: 6/15/12-6/20/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234435.5
Easting: 1020183.1
Casing Elevation: 9.49'

Borehole Depth: 25' bgs
Surface Elevation: 9.5

Descriptions By: J.Oliver/ M.Bell

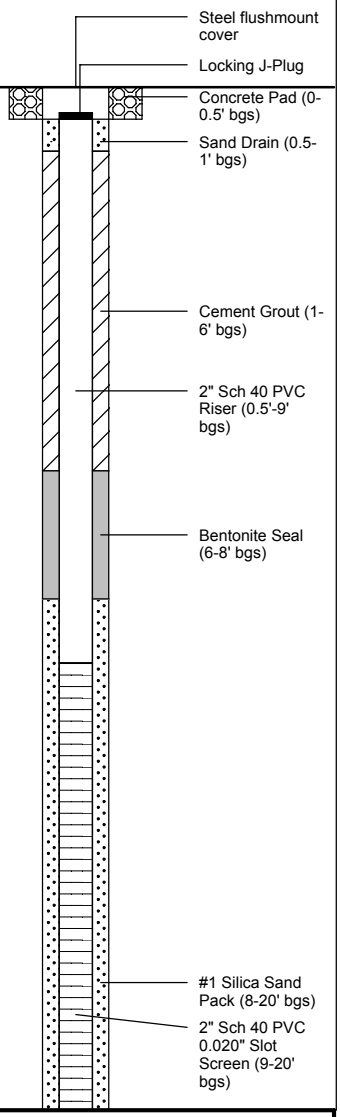
Well/Boring ID: **SB-05/MW-K3**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0 / 10				0.0			Asphalt surface.
				0.0			Brown fine to medium SAND and GRAVEL, little Organics (roots), loose, poorly sorted.
				0.0			
				0.0			
				0.0			Dark brown fine to medium SAND, some Silt, trace Gravel, loose, well sorted, moist.
	1	0-5	NA	0.0			
				0.0			Light brown fine to medium SAND, some Silt, coarse Sand, loose, well sorted, moist.
				0.0			
5 / 5				0.0			
				0.0			Light brown/brown to red-brown at 8' bgs, medium SAND, some fine and coarse Sand, poorly sorted, trace fine Gravel, moist.
				0.1			
				0.1			
	2	5-10	3.9	0.1			
				0.1			
0 / 10				0.1			
				0.1			
				0.2			Red-brown medium to fine SAND, trace coarse Sand, loose, moist to wet.
				0.2			
				1.9			Brown medium SAND, little fine and coarse Sand, well sorted, wet @ 11.9' bgs. Lamination of grey Silt @ 10.9' bgs less than .1' in thickness.
				0.1			
				0.1			
	3	10-15	3.2	0.0			
				0.5			Grey medium to coarse SAND, trace fine Sand, loose, wet.
				0.3			
-5 / 15				0.4			
				0.4			Water pH at 15' bgs: 5.70
	4	15-20	2.0	0.3			Brown/dark brown fine to medium SAND, trace coarse Sand, fine Gravel, Organics (roots), dense, moist to wet.

Well/Boring Construction



ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 10.9-11.9 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH, Inorganics.

Hand Cleared to 5' bgs.

Client: ConEdison Inc.

Well/Boring ID: **SB-05/MW-K3**

Borehole Depth: 25' bgs

Site Location:
Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				0.1			Brown/dark brown fine to medium SAND, trace coarse Sand, fine Gravel, Organics (roots), dense, moist to wet.	
				0.1				
				0.2			Black Silty fine SAND, trace medium Sand, loose, wet.	
	4	15-20	2.0					
-10 / 20							Water pH at 20' bgs: 5.52	
				0.1			Grey CLAY, trace Silt, fine Sand, plastic, dense, wet.	
	5	20-25	0.1					
-15 / 25							Boring terminated at 25' bgs.	
-20 / 30								
-25 / 35								

#1 Silica Sand Pack (8-20' bgs)

Boring collapsed at 20' bgs.

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 10.9-11.9 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide, TPH, Inorganics.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/14/12-6/19/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234339.7
Easting: 1020001.4
Casing Elevation: NA

Borehole Depth: 15' bgs
Surface Elevation: 9.3

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-06**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10				0.0			ASPHALT.	Borehole backfilled with Portland cement grout to grade.
				1.2			Brown to grey fine to medium SAND and GRAVEL, some Silt, loose, poorly sorted, moist.	
				4.1				
				9.9			Grey fine to medium SAND and SILT, some Gravel, little Clay, loose, poorly sorted, moist.	
				4.2				
	1	0-5	NA	6.8			Grey to green WOOD fragments/chips, little fine Sand, odor, moist.	
				412			Black WOOD fragments/chips, trace fine Sand, green staining, odor, moist to wet @ 4' bgs.	
5 / 5				658				
				732				
				782				
				258			Black WOOD pulp/fragments, trace Silt, loose, odor, wet.	
				506				
				951			Dark brown ORGANICS(roots/plants) and SILT, trace fine Sand, soft, loose, odor, wet.	
				1203			Dark green/black WOOD pulp/fragments, trace fine Sand, Silt, loose, odor, wet.	
0 / 0	2	5-10	2.2	1083				
10 / -5				985			Grey CLAY, little to trace Silt, little Organics (roots/plants), plastic, soft, dense, wet.	
				348				
				296				
				50.8				
				30.4			Seam of red BRICK/glass/black fine Sand @ 11.9' bgs.	
	3	10-15	4.9	8.7				
				0.9				
				0.7				
				1.2			Dark brown PEAT, trace Clay, wet.	
15 / -5				0.9				
							Boring terminated at 15' bgs.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4-5 and 12.2-13.2 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/15/12-6/19/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234392.5
Easting: 1020118.6
Casing Elevation: NA

Borehole Depth: 20' bgs
Surface Elevation: 9.5

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-07**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0				0.0			ASPHALT.	
				0.0			Brown to grey GRAVEL, some fine to medium Sand, loose, poorly sorted.	
				0.0			Brown fine to medium SAND, trace Silt, loose, well sorted, moist.	
				1.2			Black fine to medium SAND and fine GRAVEL, trace Silt, brick fragments, medium dense, poorly sorted, moist.	
	1	0-5	NA	0.0				
				1.1				
				0.0			Brown fine to medium SAND, some Gravel, loose, poorly sorted, moist to wet at 3.8' bgs.	
5				0.0				
				5.6			Dark grey fine to medium SAND, some Silt, trace Clay, loose, poorly sorted, wet.	
5				3.3			Black fine GRAVEL, some fine to medium Sand, trace Silt, poorly sorted, loose, odor, wet.	
				2.1				
				1.1			Dark grey turning grey @ 5.9' bgs fine SAND, some to little Silt, trace Clay, fine Gravel, dense, moist to wet.	
				0.9				
				0.8			Dark grey/black fine GRAVEL, some to little fine to medium Sand, trace Silt, odor, medium dense, wet. green staining	
	2	5-10	2.5	10.9				
0				15.7				
10				405				
				357				
				296			Sheen between 10-12' bgs.	
				101				
				350			Green to yellow/light brown fine Gravel and coarse to medium Sand lamination.	
	3	10-15	3.3	405			Little Coal fragments.	
-5								
15				89.4				
	4	15-20	4.0	55.8				

Borehole backfilled with Portland cement grout to grade.

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4.5-5, 10.5-12.5 and 16.4-17.4 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Client: ConEdison Inc.

Well/Boring ID: **SB-07**

Borehole Depth: 20' bgs

Site Location:
Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
				1.1				
				0.9			Grey/dark grey CLAY, trace Silt, Organics, wet.	
				0.5				
	4	15-20	4.0	0.8				
				1.1			Little Organics 17.8-18' bgs Some fine Sand 18-18.1' bgs.	
				1.1			Dark brown PEAT, little fine to medium Sand, trace Clay, wet.	
-10 / 20								
							Boring terminated at 20' bgs.	
-15 / 25								
-20 / 30								
-25 / 35								

Borehole backfilled with Portland cement grout to grade.

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4.5-5, 10.5-12.5 and 16.4-17.4 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/15/12-6/19/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234421.0
Easting: 1020189.9
Casing Elevation: NA

Borehole Depth: 20' bgs
Surface Elevation: 9.5

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: SB-08

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0				0.0			ASPHALT.	
				0.0			Dark grey fine to medium SAND and GRAVEL, medium dense, well sorted.	
				0.0			Brown fine to medium SAND, little Silt, Gravel, loose, poorly sorted.	
				0.0				
				0.0			Light brown fine to medium SAND, some Silt, little coarse Sand, loose, well sorted, moist.	
	1	0-5	NA	0.0				
				0.0				
				0.0				
5				0.0			Trace Gravel @ 4.5' bgs.	
5				0.2			Brown/light brown turning brown at 8' bgs medium SAND, some fine and coarse Sand, trace fine Gravel, poorly sorted, moist to wet.	
				0.2				
				0.2				
				0.2				
	2	5-10	3.6	0.2				Borehole backfilled with Portland cement grout to grade.
				0.2				
0				0.2				
10				0.1			Brown medium to fine SAND, trace coarse Sand, loose, wet.	
				0.1			Light brown medium to fine SAND, some coarse Sand, medium dense, wet.	
				0.1				
				0.2				
				0.1				
	3	10-15	4.5	0.1				
				140			Grey medium to coarse SAND, some fine Sand, medium dense/loose, odor, wet. Seams of grey Clay @ 13.3, 13.9, 14.3' bgs	
				167				
-5				0.4				
15				0.6				
				0.2			Grey medium SAND, some fine and coarse Sand, wet.	
	4	15-20	4.8	0.2				

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 12.8-13.9 and 13.9-14.5 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Client: ConEdison Inc.

Well/Boring ID: **SB-08**

Borehole Depth: 20' bgs

Site Location:
Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10 / 20	4	15-20	4.8	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2			Grey medium SAND, some fine and coarse Sand, wet. Seams of grey Clay @ 17.8, 18.6' bgs. Black Organics(plants) @ 18.2-18.3' bgs.	Borehole backfilled with Portland cement grout to grade.
-15 / 25							Boring terminated at 20' bgs.	
-20 / 30								
-25 / 35								

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 12.8-13.9 and 13.9-14.5 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/18/12-6/22/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234212.9
Easting: 1019657.6
Casing Elevation: NA

Borehole Depth: 9' bgs
Surface Elevation: 12.9

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-09**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
15								
0								
				0.0			ASPHALT.	
				5.7			Brown to black fine to medium SAND, some Silt, Organics (roots, geotexile fibers), loose, poorly sorted, moist.	
				9.7				
				11.2				
				50.2			Dark grey fine to medium SAND, some Gravel, little Organics (twigs, roots), loose poorly sorted, petro-like odor, moist.	
10	1	0-5	NA					
				52.7				
				263	X		Dark grey to black fine to medium SAND, some Silt, Clay, little Gravel, Organics (roots), dense, poorly sorted, petro-like odor, sheen, moist.	
5				513	X			Borehole backfilled with Portland cement grout to grade.
				29.9			Black fine SAND, some Silt, trace Clay, Organics (roots), medium dense, odor, moist.	
				31.5				
				15.1			Grey/grey-brown fine SAND, some Clay, trace Silt, fine Gravel, dense, odor, moist.	
				10.7				
	2	5-9	3.9	11.6				
5				13.4				
				0.5	X		Brown-grey fine SAND, some Clay, trace Silt, stiff, low plasticity, moist.	
				0.3	X			
10							Refusal at 9' bgs.	
0								
15								

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4-5 and 8-8.9 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/18/12-6/22/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234244.2
Easting: 1019728.1
Casing Elevation: NA

Borehole Depth: 12' bgs
Surface Elevation: 12.5

Descriptions By: J.Oliver/ M.Bell

Well/Boring ID: **SB-10**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
15								
0				0.0			ASPHALT.	
				1.2			Brown fine to medium SAND, some Gravel, loose, poorly sorted, trace green staining.	
				0.5				
				0.0			Brown fine to medium SAND, some Gravel, little coarse Sand, dense, poorly sorted, moist to wet at 3.1' bgs.	
10	1	0-5	NA	0.0				
				1.2				
				0.0				
				0.0				
				1.4				
				2.8			Dark grey to black fine to medium SAND, some Gravel, little Silt, petro-like odor, wet.	
5				128.8			Dark grey-brown/black fine SAND and SILT, some Clay, trace fine subrounded Gravel, wet.	
				100.1			Black highly viscous tar (saturated) between 5-5.9' bgs	
				10.9			Dark grey to grey/brown at 6.4' bgs SILT, little Clay, trace fine Sand, soft, non-plastic, odor, wet.	
				9.4				
				8.1				
5	2	5-10	3.8	1.5			Grey/brown Clayey fine SAND, stiff, dense, trace fine Gravel, moist/wet.	
				1.5				
				1.3				
10								
				0.9				
				0.8				
	3	10-12	2	1.0				
				0.5				
0							Refusal at 12' bgs.	
15								

Borehole backfilled with Portland cement grout to grade.

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 4.2-5, 5-6 and 7.4-8.4 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 6/18/12-6/26/12
Drilling Company: NYEG Drilling LLC.
Driller's Name: Doug Thoma
Drilling Method: Direct Push
Sampling Method: 5' MacroCore Liner
Rig Type: Track-Mounted Geoprobe Rig

Northing: 234220.9
Easting: 1019674.5
Casing Elevation: 12.11'

Borehole Depth: 11.5' bgs
Surface Elevation: 12.1

Descriptions By: J.Oliver/M.Bell

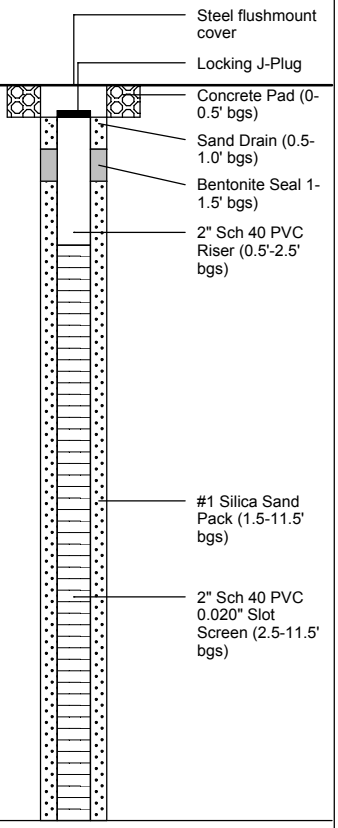
Well/Boring ID: **SB-16/MW-K6**

Client: ConEdison Inc.

Location: Krasdale Former Manufactured Gas Plant
Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
	15							
	0							
0					0.0			ASPHALT.
					1.5			Brown fine to medium SAND and GRAVEL, little Organics (roots), coarse Sand, loose, poorly sorted, petro-like odor, moist.
					1.9			Dark grey to black fine to medium SAND, trace Gravel, Organics (wood), saturated with black tar, highly viscous, tar-like odor, moist.
	10				263			Dark grey to black fine to medium SAND and GRAVEL, some Organics (wood), petro-like odor, moist.
		1	0-5	NA	43.3			
					40.2			
					38.8			
					35.3			
					19.2			Black fine to medium SAND and GRAVEL, little Organics (wood), petro-like odor, wet.
					10.6			
5					40.9			Clayey fine SAND, trace Silt, Wood chips, Organics (roots), low plasticity, coal tar like odor, moist.
					208			Tar-saturated soil between 5.0-5.1' bgs.
					101			Dark grey/brown Silty fine SAND, little Clay, trace Organics (roots), dense, odor, moist to wet.
					5.3			Brown-grey SILT, some fine Sand, soft, wet.
	5				1.8			
		2	5-10	4.4	3.1			
					1.4			Brown/brown-grey fine to medium SAND, some to little Clay, trace fine Gravel, red Brick, dense, wet.
					0.3			
					0.5			
10					0.3			Brown/brown-grey fine SAND, some Clay, dense, stiff, moist to wet.
					3.9			
		3	10-11.5	1.5	2.0			Fine to medium Sand seam at 10.3' bgs.
					1.8			
	0							Refusal at 11.5' bgs.
15								

Well/Boring Construction



ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level.

Analytical sample collected from 1-1.3 and 7.9-8.9 ft bgs for TCL VOC, TCL SVOC, TAL Metals, PCBs, pH, Cyanide.

Hand Cleared to 5' bgs.

Date Start/Finish: 10/11-11/20/2012
Drilling Company: NYEG
Driller's Name: Doug Thoma
Drilling Method: HSA/Mud rotary/Rock core
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 234319.0
Easting: 1019939.6
Casing Elevation: NA

Borehole Depth: 45' bgs
Surface Elevation: 10.4'

Descriptions By: M. Bell and P. Prezorski

Well/Boring ID: GB-01

Client: Consolidated Edison Company of New York, Inc.

Location: 400 Food Center Drive, Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	10									
		1	0-5	NA	NA	NA	0.3 1.8 0.6 0.9 1.2 2.1 4.3 3.8 20.1 80.9 135			ASPHALT. Brown fine to medium SAND and GRAVEL, some Silt, medium dense, trace large pebbles, dry to moist. Black WOOD CHIPS and SILT, trace fine to medium Sand, loose, moist, MGP like odor. Blue-green color and sulfur like odor @ 4.4-4.8' bgs.
5	5	2	5-7	1.2	2 2 2 3	4	18.1 25.4 191 84.4			Black WOOD CHIPS, trace ash MGP like odor, loose, wet.
		3	7-9	1.3	3 3 3 3	6	194 89.7 161 154			
10	0	4	9-11	0	1 1 1 1	2	NA			No Recovery.
		5	11-13	0.8	1 1 2 2	3	131 90.1 100 50.4			Black WOOD CHIPS, trace ash, MGP like odor, loose, wet. Olive green Silty CLAY, little Organics (rootlets), soft, wet, MGP like odor. Sample collected from 13-15' bgs. Augered to 20' bgs.
15	-5	6	13-15	0.7	NA	NA	NA			
		7	15-20	NA	NA	NA	NA			

Well/Boring Construction: Borehole backfilled with Portland Cement Grout.

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
Analytical sample collected from 20-22' bgs for Grain Size (D488), Moisture Content (D2216) and Specific Gravity (D854) and 35-37' bgs for Grain Size (D488), Moisture Content (D2216).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs.

Client: Consolidated Edison Company of New York, Inc.

Well/Boring ID: **GB-01**

Borehole Depth: 45' bgs

Site Location:
400 Food Center Drive, Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	-10	8	20-22	1.1	9 8 13 9	21	0.0 0.0 0.0 0.0	X		Olive-green fine to medium SAND and SILT, little fine Gravel, trace coarse Gravel, medium dense, wet. Augered from 22-25' bgs.	
25	-15	9	25-27	0.8	12 14 17 32	31	0.0 0.0 0.0 0.0			Olive-green fine to medium SAND and SILT, little fine Gravel, trace coarse Gravel, medium dense, wet. Gold fine to medium SAND and medium subrounded-subangular Gravel @25.4 to 25.8' bgs (possibly Pyrite). Augered from 27-28' bgs. HSA refusal at 28' bgs. Installed spinning casing to drill through obstruction.	Borehole backfilled with Portland Cement Grout.
30	-20	10	28-30.5	1.16	66 19 17 17	36	0 14 0 NA			Strong brown- brown (7.5YR 5/6-5/4) (top of core) to gray (7.5YR 5/6)(bottom of core) fragmented ROCK, then fine to medium Sand, very fine to medium little silt, little coarse sand, wet, moderate odor. Refusal at 29' bgs. boulder obstruction. Switched to mud-rotary. Refusal at 30.5'. Switched to rock coring.	
		11	30.5-35	0.583	NA	NA	0.0 0.0			Rock core drilling. GNEISS coated with Pyrite.	
35	-25	12	35-37	2	10 10	28	0.0 0.0	X		Brown (7.5YR 4/4) very fine to coarse SAND, little small subangular-subrounded Pebbles, wet.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
Analytical sample collected from 20-22' bgs for Grain Size (D488), Moisture Content (D2216) and Specific Gravity (D854) and 35-37' bgs for Grain Size (D488), Moisture Content (D2216).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs.

Client: Consolidated Edison Company of New York, Inc.

Well/Boring ID: **GB-01**

Borehole Depth: 45' bgs

Site Location:
400 Food Center Drive, Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		12	35-37	2	18 23	28	0.0 NA			Brown (7.5YR 4/3) very fine to fine SAND, wet.	
										Drilling by mud-rotary. Drilled to 40' bgs. Refusal at 38.5' bgs due to obstruction. Switched to Rock Coring method.	
40	-30	13	38.5 - 43.5	0.29	NA	NA	0.0			Rock core drilling. Metamorphic Rock fragments (boulders).	Borehole backfilled with Portland Cement Grout.
										Brown (7.5YR 4/3)very fine to medium SAND with muscovite and pyrite flakes/fragments, trace small pebbles, no odor, wet.	
		14	43.5-45	2	21 36 59 1309	NA	0.0 0.0 0.0 0.0			Brown (7.5YR 4/3) very coarse SAND, little medium Sand, wet.	
										Brown (7.5YR 4/3) fine to coarse SAND, slight Clay contact, medium plasticity wet.	
45	-35									Weathered GNEISS, no odor, moist.	
50	-40										
55	-45										

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
Analytical sample collected from 20-22' bgs for Grain Size (D488), Moisture Content (D2216) and Specific Gravity (D854) and 35-37' bgs for Grain Size (D488), Moisture Content (D2216).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs.

Date Start/Finish: 10/11-10/17/2012
Drilling Company: NYEG
Driller's Name: Doug Thoma
Drilling Method: HSA/Mud Rotary/Rock core
Auger Size: 4.25" ID
Rig Type: CME-55
Sampling Method: 2" x 2' Split Spoon

Northing: 234432.4
Easting: 1020216.7
Casing Elevation: NA

Borehole Depth: 47' bgs
Surface Elevation: 9.6'

Descriptions By: M.Bell

Well/Boring ID: GB-02

Client: Consolidated Edison Company of New York, Inc.

Location: 400 Food Center Drive, Bronx, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	10									
										ASPHALT.
										Brown fine to medium SAND and SILT, some fine Gravel, dense, dry.
										Reddish brown fine to medium SAND, some Silt, trace coarse Sand, loose, dry to moist.
		1	0-5	NA	NA	NA	0.0 0.0 0.0 0.0 0.0			
5	5									
		2	5-7	1.3	2 4 4 4	8	0.0 0.0 0.0 0.0	X		Brown fine to medium SAND, trace coarse Sand, loose, moist.
		3	7-9	1.5	3 5 6 7	11	0.0 0.0 0.2 0.4			Reddish brown to brown fine to medium SAND, trace coarse Sand, medium dense, moist. Wet at 7.4' bgs.
10	0									
		4	9-11	0.8	9 9 6 13	15	0.0 0.0 0.0 0.0			Orange brown fine to medium SAND and SILT, medium dense, wet.
										Orange brown to gray SILT and medium subrounded to subangular GRAVEL (crushed rock), little fine to medium sand, medium dense, wet.
		5	11-13	0.0	7 8 15 5	13	NA			NO RECOVERY.
15	-5									
		6	13-15	0.8	9 10 6 10	16	0.0 0.2 0.1 0.8	X		Orange brown SILT, some fine-medium Sand, medium dense, wet, layer of dark gray subrounded-subangular GRAVEL at 14.8-15.0' bgs.
		7	15-17	0.9	4 3	5	0.0 0.0			

Borehole backfilled with Portland Cement Grout

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
.Analytical sample collected from 5-7' for Grain Size (D488), Moisture Content (D2216) and at 13-15' bgs for Grain Size (D488), Atterberg Limit (D4318), Moisture Content (D2216) and Specific Gravity (D854).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs

Client: Consolidated Edison Company of New York, Inc.

Well/Boring ID: **GB-02**

Borehole Depth: 47' bgs

Site Location:
400 Food Center Drive, Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	7	15-17	0.9	2 9	5	0.0 0.0			Orange brown SILT, some fine-medium Sand, medium dense, wet. Layer of dark gray subrounded to subangular medium Gravel at 14.8-15' bgs.	
	8	17-19	0.6	10 9 7 4	16	0.0 0.0 0.1 0.3			Reddish brown fine to medium SAND and subrounded to subangular GRAVEL, trace silt, medium dense, wet.	
-10 20	9	19-21	0.6	10 7 7 7	14	0.0 0.0 0.3 0.2			Reddish brown to brown SILT, some fine-medium Sand, medium dense, wet. Layer of dark gray subangular to angular Gravel at 20.4-21' bgs.	
	10	21-23	0.0	10 3 3 9	6	NA			NO RECOVERY.	
-15 25	11	23-25	1.5	10 9 9 13	18	0.0 0.0 0.4 0.0			Reddish brown fine to medium SAND and SILT, medium dense, wet. Layer of olive green to black SILT and subrounded to subangular Gravel, trace coarse Gravel, trace clay at 24.7-25' bgs.	
	12	25-27	0.5	6 3 3 8	6	0.0 1.8 0.0 0.0			Dark gray Silty CLAY, trace fine Sand, very soft, low plasticity, low dilatancy, wet. Wood fragments at 25.3' bgs. Layer of olive green fine to medium SAND and SILT, trace Clay from 26.7-27' bgs.	Borehole backfilled with Portland Cement Grout
-20 30	13	27-30	0.8	10 14 19 13	33	0.0 0.0 0.0 0.0			Gray to brown fine to medium SAND and SILT, little medium subrounded to subangular Gravel, trace organics (crushed shells), dense, wet. Augered to 30' bgs.	
	14	30-32	1.0	12 16 32 32	48	0.0 0.0 0.0 0.0	X		Brown fine to medium SAND, some Silt, little coarse sand, dense, wet. Olive brown SILT, little fine to medium Sand, trace clay, trace fine Gravel, dense, wet. Augered to 35' bgs.	
-25 35										
	15	35-37	1.1	18 22	NA	0.0 0.0			Brown fine to medium SAND, little Silt, trace coarse sand. Augered to 40' bgs.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
.Analytical sample collected from 5-7' for Grain Size (D488), Moisture Content (D2216) and at 13-15' bgs for Grain Size (D488), Atterberg Limit (D4318), Moisture Content (D2216) and Specific Gravity (D854).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs

Client: Consolidated Edison Company of New York, Inc.

Well/Boring ID: **GB-02**

Borehole Depth: 47' bgs

Site Location:
400 Food Center Drive, Bronx, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
40 / -30	15	35-40	1.1	50/0.4	NA	0.0 0.0			Brown fine to medium SAND, little Silt, trace coarse sand. Layer of subrounded to subangular GRAVEL at 36.7-37' bgs. HSA refusal at 37' bgs, Split spoon was used to break boulder not bedrock. Augered to 40' bgs	
45 / -35	16	40-42	1.6	12 31 50/3	NA	0.0 0.0 0.0 0.0	X		Brown fine to medium SAND and SILT, little coarse Sand, trace clay, dense, wet. Augered to 45' bgs.	Borehole backfilled with Portland Cement Grout
50 / -40	17	45-47	0.4	50/0.4	NA	0.0 0.0 0.0 0.0			Black to white fine to medium SAND and SILT, trace coarse Sand, trace clay, dense, wet. (Weathered BEDROCK- schist).	
55 / -45									End of boring.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available;
.Analytical sample collected from 5-7' for Grain Size (D488), Moisture Content (D2216) and at 13-15' bgs for Grain Size (D488), Atterberg Limit (D4318), Moisture Content (D2216) and Specific Gravity (D854).
1. Coordinates are based on the North American Datum of 1983 (NAD83)- State Plane New York Long Island.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. Hand cleared to 5' bgs

ARCADIS

Appendix B

Groundwater Monitoring Forms

ARCADIS

Groundwater Sampling Form

Project No. 30043027.0002.08000 Well ID MW-K1 Date 11/14/11

Project Name/Location Con Ed - Kingsbridge Weather

Measuring Pt. Description TOC Screen Setting (ft-bmp) 2.5-15 Casing Diameter (in.) 2 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 14.53 TOC Static Water Level (ft-bmp) 4.25 Water Column in Well ___ Gallons in Well ___

Calc. Gallons Purged ___ Pump Intake (ft-bmp) ~10.5 Purge Method: Centrifugal ___ Sample Method Low Flow

Gallons Purged ___ MP Elevation ___ Submersible ✓ Pump On/Off 11:30 AM /1248

Sample Time: Label 1200 Replicate/ Code No. NA Disp. Bailer ✓ Other ___ Sampled by Prezorski

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
11:30AM		360	4.24		2.10	5.73	Off range	2.03	15.23	125	Black	strong
11:35		350	4.24		2.03	6.49	957	1.26	15.80	79	Black Tint	strong
11:40		350	4.24		2.02	7.15	506	1.00	16.17	96	Black tint	strong
11:45		350	4.24		1.98	6.86	122	.80	16.32	83	slight Black tint	strong
11:50		350	4.24		1.97	8.90	90.7	.77	16.46	97	"	"
11:55		350	4.24		1.96	7.56	55.5	.71	16.57	117	clear	strong
1200		350	4.24		1.96	8.65	44.3	.68	16.60	113	"	"
1205		350	4.24		2.17	9.19	28.5	1.02	16.69	119	clear	strong

Constituents Sampled	Container	Number	Preservative
Sample time: 1200			

Well Information

Well Location: MW-K1

Condition of Well: Good

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No No lock

Well Locked at Departure: Yes / No

Key Number To Well:

NOTES:

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.5" = 0.09 2.5" = 0.26 3.5" = 0.50 6" = 1.47

1.25" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

ARCADIS

Groundwater Sampling Form

Page ____ of ____

Project No. _____ Well ID MW-K2 Date _____

Project Name/Location _____ Weather _____

Measuring Pt. Description _____ Screen Setting (ft-bmp) 4-20 Casing Diameter (in.) 2 Well Material ____PVC ____SS ____Other

Total Depth (ft-bmp) _____ Static Water Level (ft-bmp) 3.68 Water Column in Well _____ Gallons in Well _____

Calc.Gallons Purged _____ Pump Intake (ft-bmp) 14 Purge Method: Centrifugal _____ Submersible _____ Disp. Bailer _____ Other _____ Sample Method _____

Gallons Purged _____ MP Elevation _____ Pump On/Off _____

Sample Time: Label 1300 Replicate/ Code No. NA Sampled by Prazuski

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
12:35		250			1.29	25.4	over range	1.13	14.75	156	black	Mild
12:40		250	3.68		1.24	26.3	948	.78	14.94	214	"	"
12:45		adjusted	3.68		1.22	27.0	529	.65	14.71	237		
12:50		150	—		1.20	27.4	339	.93	14.37	243	tan silt	mild
12:55		150	3.68		1.23	25.5	162	.94	13.43	236	clear	mild
13:00		150	3.68		1.25	26.8	135	.55	13.20	240	clear	mild

Constituents Sampled	Container	Number	Preservative
Sample Time: 1300			

Well Information

Well Location: _____ Well Locked at Arrival: Yes / No (already locked)

Condition of Well: _____ Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: _____

_____

_____

_____

_____

Volumes

" = 0.04 1.5" = 0.09 2.5" = 0.26 3.5" = 0.50 6" = 1.47

" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

ARCADIS

Groundwater Sampling Form

Project No. ____ Well ID MW-K3 Date 11/15/12

Project Name/Location ConEd Kreisdale Weather overcast, 50

Measuring Pt. Description ____ Screen Setting (ft-bmp) 9-20 Casing Diameter (in.) 2 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) ____ Static Water Level (ft-bmp) after pump in: 7.33 / 7.33 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) 15 Purge Method: Centrifugal ____ Submersible X Sample Method low-flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer ____ Pump On/Off 1410/1550

Sample Time: Label 1505 Replicate/ Code No. DUP-2 Other ____ Sampled by JH

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1415	5	150	7.38		3.09	8.83	107	1.38	14.50	301	yellow	strong
1420	10	150	7.41		3.13	9.08	80.5	0.89	14.91	295	yellow	strong
1425	15	150	7.46		3.13	9.20	67.6	0.70	15.14	297	yellow	strong
1430	20	150	7.48		3.10	9.31	61.8	0.62	15.04	303	yellow	strong
1435	25	150	7.51		3.04	9.39	50.3	0.56	15.04	314	yellow	strong
1440	30	150	7.55		2.96	9.41	44.2	0.56	15.03	327	clear	strong
1445	35	150	7.60		2.84	9.38	33.5	0.60	15.03	339	clear	strong
1450	40	150	7.65		2.78	9.29	22.6	0.58	15.00	345	clear	strong
1455	45	150	7.71		2.77	9.26	21.2	0.57	15.00	345	clear	strong
1500	50	150	7.76		2.81	9.26	4.4	0.55	15.12	343	clear	strong
1505	55	150	7.81		2.84	9.29	0.2	0.53	15.40	341	clear	strong

Constituents Sampled	Container	Number	Preservative
Sample this 1505			

Well Information

Well Location: ____ Well Locked at Arrival: NA Yes / No

Condition of Well: ____ Well Locked at Departure: NA Yes / No

Well Completion: (Flush Mount) / Stick Up Key Number To Well: NA

NOTES: ____

Well Casing Volumes

Gallons/Foot				
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Project No. 60143027.0002.08000 Well ID MW-46 Date 11/19/12

Project Name/Location Con Ed - Kraddock Weather

Measuring Pt. Description — Screen Setting (ft-bmp) 2.5-11.5 — Casing Diameter (in.) 2 — Well Material ✓ PVC ___ SS ___ Other

Total Depth (~~ft-bmp~~ TOC) 10.66 — Static Water Level (ft-bmp) 4.51 — Water Column in Well — Gallons in Well

Calc. Gallons Purged — Pump Intake (ft-bmp) ~~9~~ 9.5-10.5 — Purge Method: Centrifugal ___ Submersible ✓ Disp. Bailer ✓ Other — Sample Method Low Flow

Gallons Purged — MP Elevation — Pump On/Off 1356

Sample Time: Label 1505 — Replicate/ Code No. NA — Sampled by Prezwoski

Time	Minutes Elapsed	Rate (~~gpm~~) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (~~µmhos~~) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (~~°F~~)	Redox (mV)	Appearance	
											Color	Odor
1400		950	6.20		6.51	1.49	over range	4.59	15.73	-43	Dark tan	strong
1405		350	6.45		6.89	1.36	" "	1.50	15.95	-80	—	—
1410		350	7.58		6.98	1.44	370	1.39	16.42	-95	tan tint	moderate
1415		~~300~~ 350	7.91		6.99	1.39	240	1.43	16.54	-96	clear tan tint	moderate
1420		300	8.52		6.99	1.46	480	1.41	16.82	-101	"	"
1425		300	8.92		7.12	1.44	water entered pump *	1.48	16.86	-102	tan	"
1430		300	9.41		7.07	1.29	over range	1.27	16.92	-102	tan	"
1435		300	—		7.04	1.39	1000	1.37	16.95	-96	tan tint	"
1440		300	9.29		7.10	1.42	over range	3.19	16.89	-96	dark tan	"
1445			—		7.07	1.24	over range	2.96	16.94	-85	dark tan	"
1450		Rate lowered	8.61		6.94	1.38	"	3.13	16.81	-82	tan	"
1455		200	8.52		7.09	1.35	446	2.98	16.69	-74	tan	"
1500		200	8.36		7.14	1.34	230	3.45	16.66	-81	clear slight tan	"

Constituents Sampled	Container	Number	Preservative
Sample Time: 1505			

Well Information

Well Location: — Well Locked at Arrival: Yes / No N/A

Condition of Well: — Well Locked at Departure: Yes / No Locked

Well Completion: Flush Mount / Stick Up — Key Number To Well:

NOTES: * Pump dropped to bottom of well, ↑ Turbidity

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Appendix C

Geotechnical Laboratory Results

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	12/12/12	Checked By:	jdt
Depth :	---	Test Id:	256676		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
GB-01	GB-01 (20-22)	20-22 ft.	Moist, grayish brown silty sand	14.2
GB-01	GB-01 (35-37)	35-37 ft.	Moist, grayish brown sand with silt	13.6
GB-02	GB-02 (5-7)	5-7 ft.	Moist, dark yellowish brown sand with silt	5.6
GB-02	GB-02 (13-15)	13-15 ft.	Moist, dark yellowish brown sand with silt	29.2
GB-02	GB-02 (30-32)	30-32 ft.	Moist, dark yellowish brown silty sand	15.5
GB-02	GB-02 (40-42)	40-42 ft.	Moist, dark yellowish brown silty sand	16.3

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	---	Sample Type:	---	Tested By:	ema
Sample ID:	---	Test Date:	12/17/12	Checked By:	jdt
Depth :	---	Test Id:	256681		

Specific Gravity of Soils by ASTM D 854-10

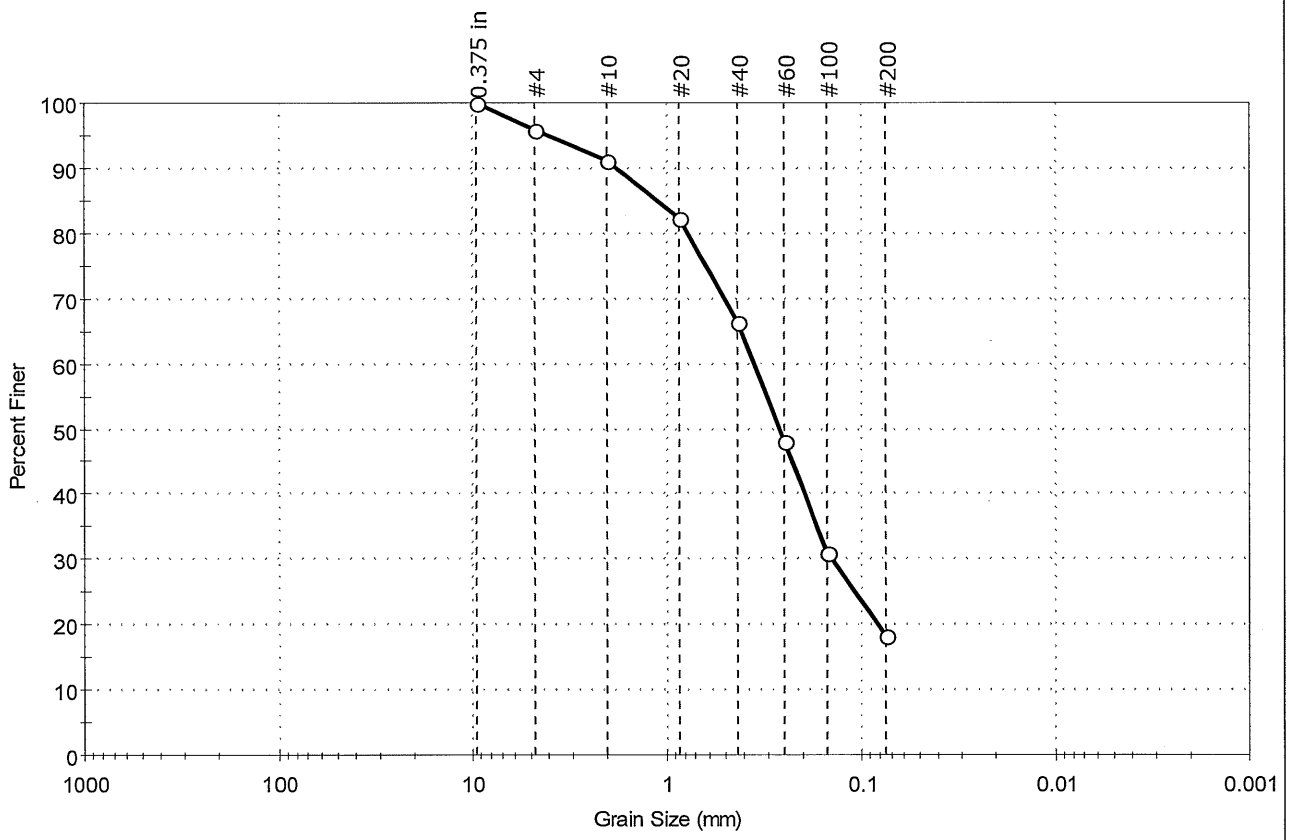
Boring ID	Sample ID	Depth	Visual Description	Specific Gravity
GB-01	GB-01 (20-22)	20-22 ft.	Moist, grayish brown silty sand	2.77
GB-02	GB-02 (13-15)	13-15 ft.	Moist, dark yellowish brown sand with silt	2.78
GB-02	GB-02 (30-32)	30-32 ft.	Moist, dark yellowish brown silty sand	2.76

Notes: Specific Gravity performed by using method A (oven dried specimens) of ASTM D 854
Moisture Content determined by ASTM D 2216.

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-01	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-01 (20-22)	Test Date:	12/12/12	Checked By:	jdt
Depth :	20-22 ft.	Test Id:	256666		
Test Comment:	---				
Sample Description:	Moist, grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.2	77.5	18.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	96		
#10	2.00	91		
#20	0.85	82		
#40	0.42	66		
#60	0.25	48		
#100	0.15	31		
#200	0.075	18		

Coefficients

D_{85} =1.1081 mm	D_{30} =0.1431 mm
D_{60} =0.3539 mm	D_{15} =N/A
D_{50} =0.2643 mm	D_{10} =N/A
C_u =N/A	C_c =N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

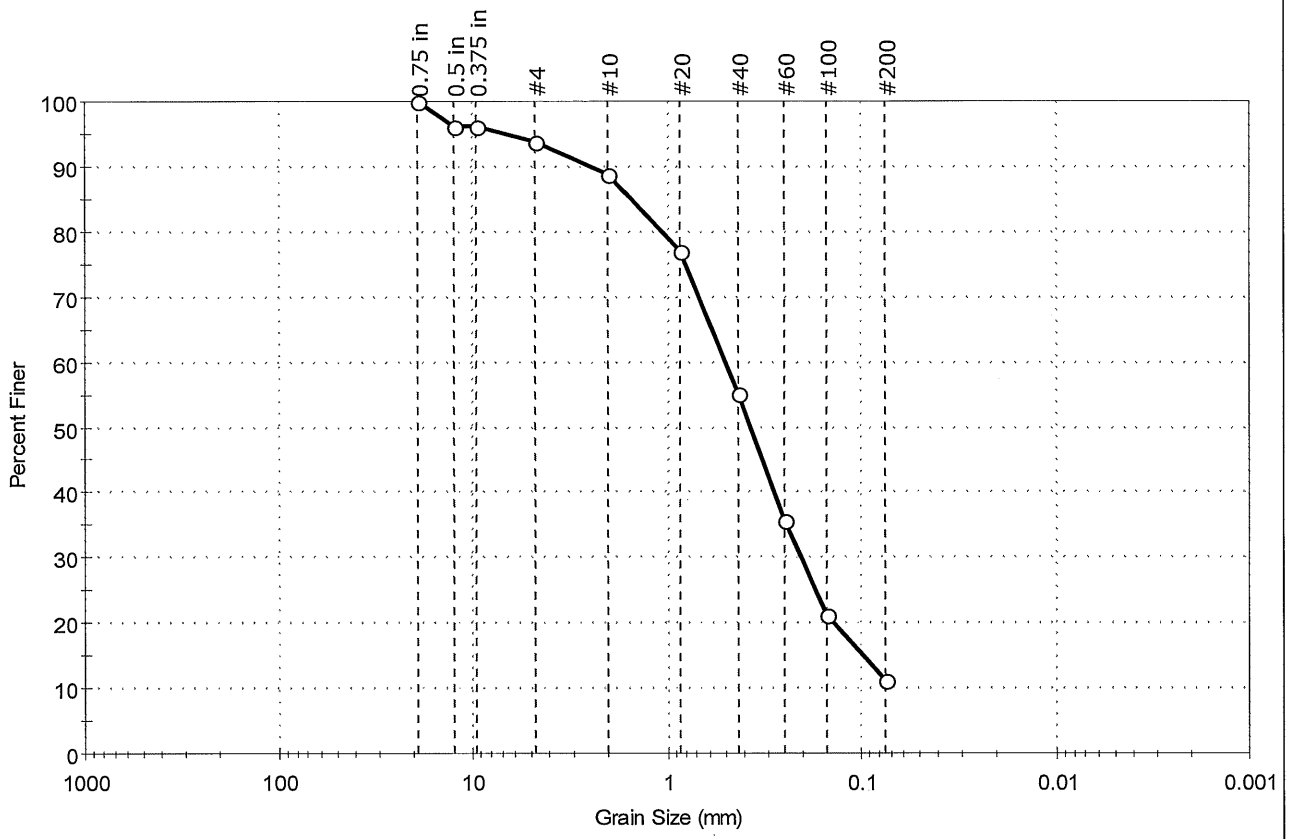
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-01	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-01 (35-37)	Test Date:	12/12/12	Checked By:	jdt
Depth :	35-37 ft.	Test Id:	256671		
Test Comment:	---				
Sample Description:	Moist, grayish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	6.2	82.5	11.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	96		
#4	4.75	94		
#10	2.00	89		
#20	0.85	77		
#40	0.42	55		
#60	0.25	36		
#100	0.15	21		
#200	0.075	11		

Coefficients

D_{85} =1.5210 mm	D_{30} =0.2035 mm
D_{60} =0.4966 mm	D_{15} =0.0967 mm
D_{50} =0.3695 mm	D_{10} =0.0686 mm
C_u =7.239	C_c =1.216

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

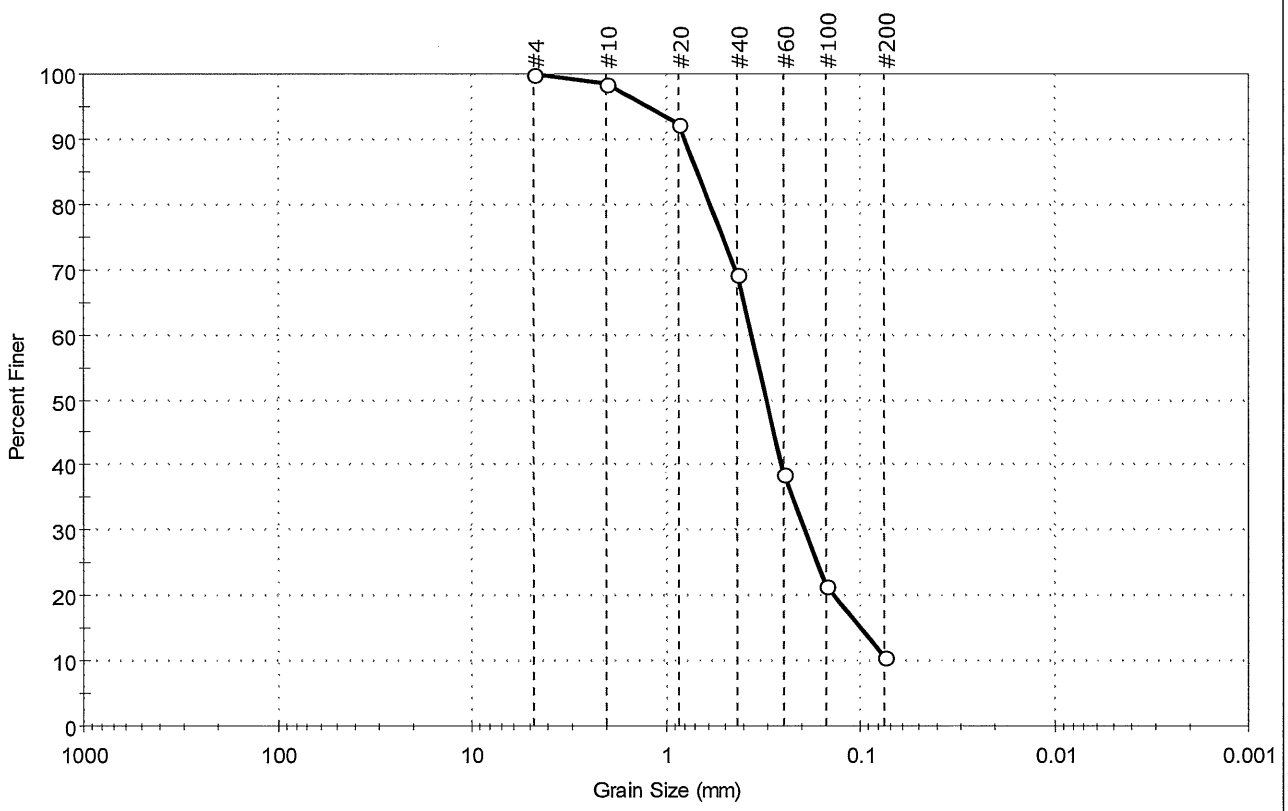
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-02	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-02 (13-15)	Test Date:	12/12/12	Checked By:	jdt
Depth :	13-15 ft.	Test Id:	256668		
Test Comment:	---				
Sample Description:	Moist, dark yellowish brown sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	89.3	10.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	92		
#40	0.42	69		
#60	0.25	39		
#100	0.15	21		
#200	0.075	11		

Coefficients

D_{85} =0.6819 mm	D_{30} =0.1931 mm
D_{60} =0.3610 mm	D_{15} =0.0988 mm
D_{50} =0.3038 mm	D_{10} =0.0716 mm
C_u =5.042	C_c =1.443

Classification

ASTM Poorly graded sand with silt (SP-SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-02	Sample Type:	bag	Tested By:	cam
Sample ID:	GB-02 (13-15)	Test Date:	12/12/12	Checked By:	jdt
Depth :	13-15 ft.	Test Id:	256678		
Test Comment:	---				
Sample Description:	Moist, dark yellowish brown sand with silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
●	GB-02 (13-15)	GB-02	13-15 ft.	29	n/a	n/a	n/a	n/a	Poorly graded sand with silt (SP-SM)

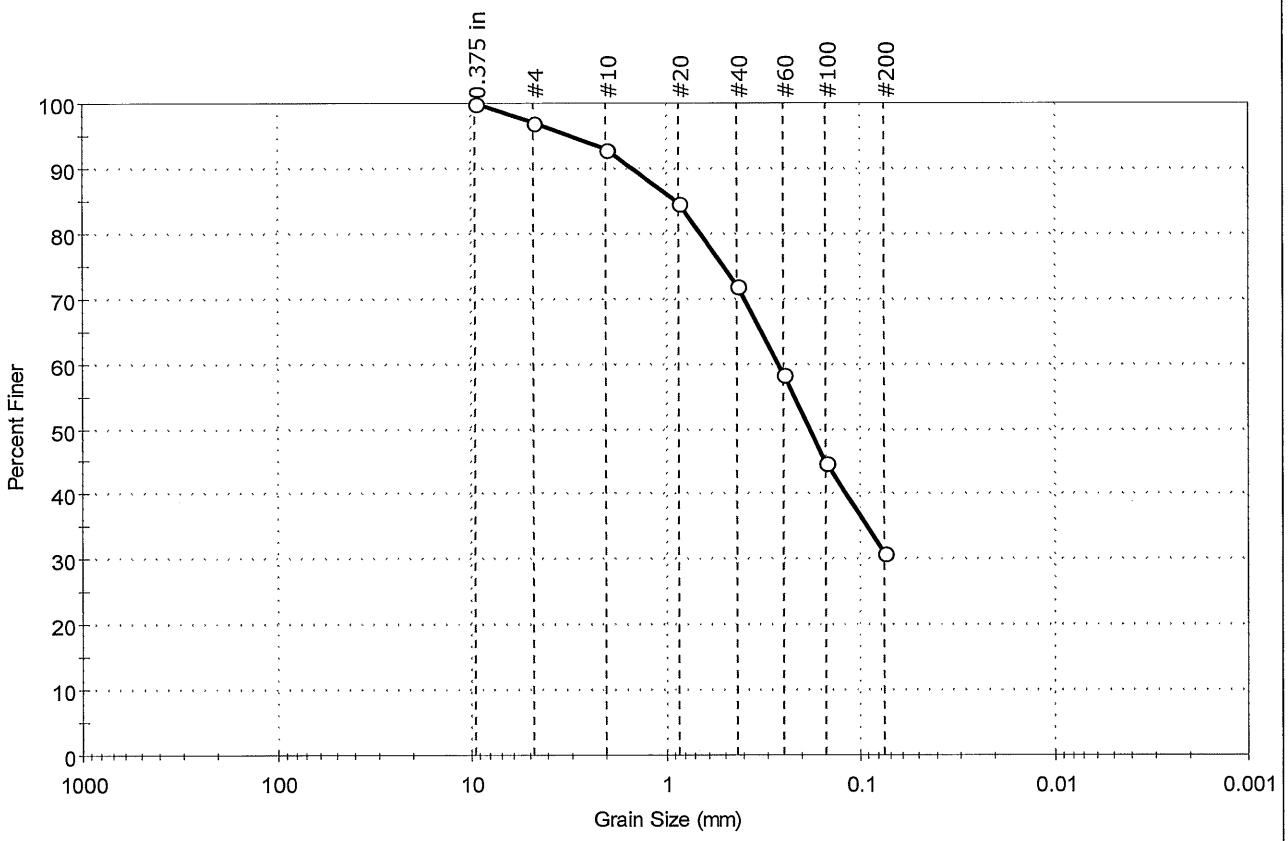
31% Retained on #40 Sieve
Dry Strength: NONE
Dilatancy: RAPID
Toughness: n/a
The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-02	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-02 (30-32)	Test Date:	12/12/12	Checked By:	jdt
Depth :	30-32 ft.	Test Id:	256669		

Test Comment: ---
Sample Description: Moist, dark yellowish brown silty sand
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.9	66.1	31.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	97		
#10	2.00	93		
#20	0.85	85		
#40	0.42	72		
#60	0.25	59		
#100	0.15	45		
#200	0.075	31		

Coefficients

D_{85} = 0.8704 mm D_{30} = N/A
D_{60} = 0.2648 mm D_{15} = N/A
D_{50} = 0.1815 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

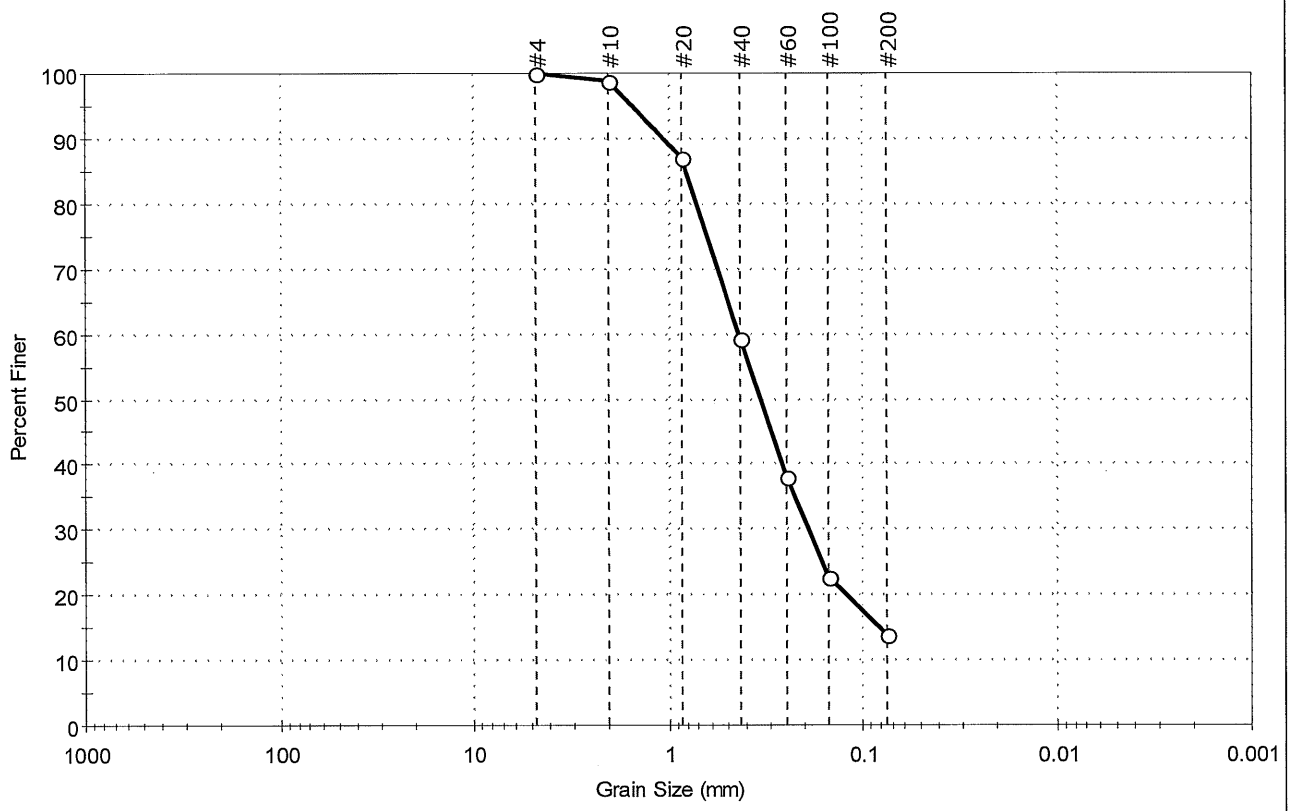
Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-02	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-02 (40-42)	Test Date:	12/12/12	Checked By:	jdt
Depth :	40-42 ft.	Test Id:	256670		
Test Comment:	---				
Sample Description:	Moist, dark yellowish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	—	86.2	13.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	87		
#40	0.42	59		
#60	0.25	38		
#100	0.15	23		
#200	0.075	14		

Coefficients

D_{85} =0.8088 mm	D_{30} =0.1915 mm
D_{60} =0.4324 mm	D_{15} =0.0825 mm
D_{50} =0.3372 mm	D_{10} =0.0560 mm
C_u =7.721	C_c =1.514

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

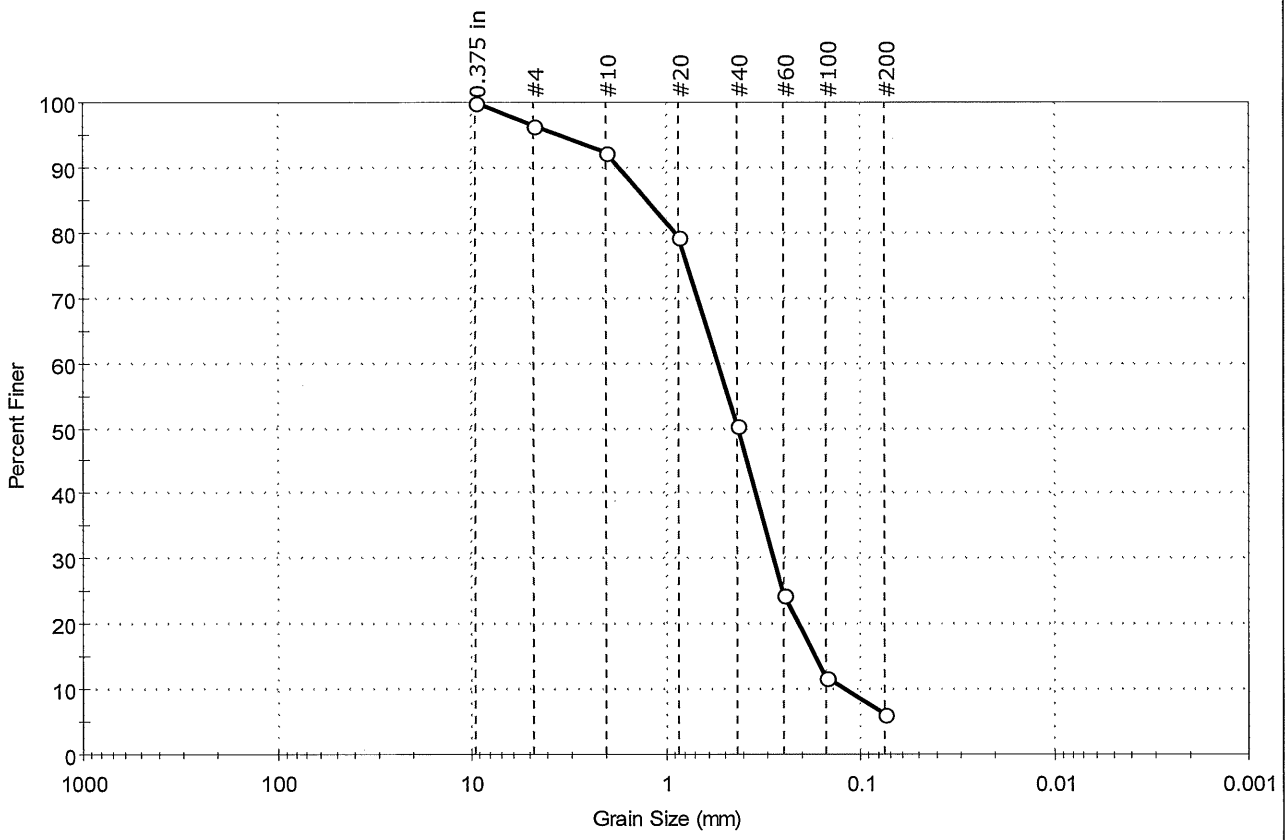
Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Arcadis U.S., Inc.				
Project:	Con Ed - Krasdale				
Location:	Bronx, NY			Project No:	GTX-300071
Boring ID:	GB-02	Sample Type:	bag	Tested By:	jbr
Sample ID:	GB-02 (5-7)	Test Date:	12/12/12	Checked By:	jdt
Depth :	5-7 ft.	Test Id:	256667		

Test Comment: ---
Sample Description: Moist, dark yellowish brown sand with silt
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.6	90.2	6.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	96		
#10	2.00	92		
#20	0.85	79		
#40	0.42	51		
#60	0.25	24		
#100	0.15	12		
#200	0.075	6		

Coefficients

D_{85} = 1.2300 mm D_{30} = 0.2801 mm
D_{60} = 0.5330 mm D_{15} = 0.1713 mm
D_{50} = 0.4201 mm D_{10} = 0.1214 mm
C_u = 4.390 C_c = 1.212

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD

ARCADIS

Appendix H

Construction Site Management Plan

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Consolidated Edison Company of New York, Inc.

Construction Site Management Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

September 2014

ARCADIS

Table of Contents

Figures

Appendix

1. Introduction

1.1 General

This Construction Site Management Plan (CSMP) presents the operating guidelines for storm sewer replacement construction activities on the Krasdale Foods Leasehold, Inc. property located on the northeastern portion of the Hunts Point former MGP site (Krasdale site).

1.2 Project Construction Areas

The Krasdale site is located on the eastern portion of Hunts Point in the Borough of Bronx, New York City, Bronx County, New York (Figure 1). The subject storm sewer is located along the northern portion of the Krasdale site. In order to minimize disruption to typical daily operations on the Krasdale site during the storm sewer replacement, a portion of a parcel of land (referred to as Parcel D) located immediately north of the Krasdale site will be available for contractor use as a construction support area (i.e., Area for Contractor Use). Parcel D is currently a vacant parcel of land owned by the New York City Economic Development Corporation (NYC EDC) and consists of scrub shrub vegetation and is absent of any structures.

The Area for Contractor Use will be used for access and construction support activities; however, no intrusive activities will be conducted in this area during the storm sewer replacement activities. The Area for Contractor Use will include temporary support facilities and features (i.e., equipment staging area(s), office trailers, and access road(s)).

For the purposes of the storm sewer replacement project, the portion of the Krasdale site required to implement the storm sewer replacement along with the Area for Contractor Use (i.e., a portion of Parcel D) are collectively referred to as the Project Construction Area. Figure 2 identifies the extent of the Project Construction Area.

1.3 Purpose

The purpose of this CSMP is to specify the engineering controls (ECs) and best management practices (BMPs) to be followed during the storm sewer replacement activities. The specified ECs and BMPs are intended to manage potential environmental issues pertaining to the execution of all construction work associated with the storm sewer replacement activities.

1.4 Document Organization

Section	Description
Section 1 - Introduction	Presents the general background and purpose of this CSMP, describes the project area associated with the storm sewer replacement, and outlines the documents organization.
Section 2 – Site Background	Describes the site history, and general nature and extent of contamination present in the Project Construction Area, and storm sewer replacement design documents.
Section 3 – Engineering Controls and Best Management Practices	Presents the ECs and BMPs to be implemented during the storm sewer replacement.
Section 4 – Inspections and Notifications	Describes the daily inspections that will be performed to verify the ECs and BMPs are being properly executed and maintained.
Section 5 – Post-Construction Conditions	Describes the site restoration following the completion of the storm sewer replacement activities.
Section 6 – Contingency Plan	Identifies the contingency measures to implement in the event of an emergency.
Section 7 - References	Lists the applicable references cited throughout the document.

2. Site Background

2.1 Site History

The Hunts Point former MGP was operated by Con Edison from late 1926 to 1962. Demolition of the former MGP was completed in early 1968. That same year, Con Edison sold the majority of the 205-acre site to the City of New York for use as a wholesale cooperative food market. Portions of the former MGP have since been divided into parcels (A through F) for purposes of investigation and remediation to be completed by others. The Krasdale site is located on the Hunt's Point former MGP and is currently used as a warehouse for shipping and receiving of food products.

2.2 Nature and Extent of Contamination

The nature and extent of MGP-impacts are limited to the soils and groundwater within the Project Construction Area. The types of MGP-impacts present consist of coal tar/non-aqueous phase liquids (NAPL) and purifier waste. The constituents of potential concern (COPCs) primarily consist of benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, polycyclic aromatic hydrocarbons (PAHs), cyanide and metals. Additionally, purifier waste deposits within and near the Project Construction Area have caused an area of low pH (pH of 2-3 Standard Units) groundwater.

The following exposure pathway categories have been assigned to materials present within the Project Construction Area based on visual observation and prior investigation results and are as follows:

There are three significant pathways by which the COPCs can come into contact with or enter the body. These routes of exposure are as follows:

1. Inhalation of gases, vapors, dusts or mists is a potential route of exposure. Chemicals can enter and irritate the nose, air passages and lungs. COPCs can become deposited in the airways or can be absorbed through the lungs into the bloodstream. The blood can then transport these substances to the rest of the body.

2. Direct contact with the skin or eyes is a potential route of exposure. Some substances are absorbed through the skin and enter the bloodstream. Broken, cut or cracked skin will allow substances to enter the body more easily.

3. Ingestion of food, drink, or other substances is the third route of potential exposure. COPCs that contact food, cigarettes, utensils or hands can be swallowed. COPCs can be absorbed into the blood and then transported to the rest of the body.

In addition, environmental pathways by which the COPCs can be transported include wind and water erosion as well as sediment runoff of MGP-impacted materials into the surrounding and adjacent environment.

As part of this CSMP, ECs and BMPs to mitigate and control these exposure pathways are described herein.

2.3 Construction Documents

A Interim Remedial Measure Work Plan (IRMWP), inclusive of: design drawings; specifications; and supporting documents, was prepared to present the construction elements to implement the storm sewer replacement. Supporting documents included in the IRMWP consist of: a Stormwater Pollution Prevention Plan (SWPPP), a Community Air Monitoring Plan (CAMP); a Waste Management Plan (WMP), and a Construction Quality Assurance Plan (CQAP).

The SWPPP presents the storm water pollution and prevention control measures including erosion and sedimentation control measures to be implemented during the storm sewer replacement. Refer to Appendix D of the IRMWP for additional information regarding the SWPPP.

As presented in the CAMP, an air monitoring program will be implemented during the storm sewer replacement consistent with the requirements of the New York State Department of Health (NYSDOH) Generic CAMP. The CAMP will be implemented by the Oversight Engineer during the storm sewer replacement, including site preparation activities. The CAMP requires monitoring at the perimeter of the Project Construction Area for potential airborne releases of COPCs as well as particulate matter (i.e., dust) generated during the construction activities. Refer to Appendix E of the IRMWP for additional information regarding the CAMP.

The WMP describes the waste characterization procedures as well as material handling, treatment, and disposal requirements for various waste materials that are expected to be generated during the storm sewer replacement. Refer to Appendix F of the IRMWP for additional information regarding the WMP.

The CQAP presents the materials, procedures, and testing protocols necessary for proper construction, evaluation, and documentation of the storm sewer replacement activities. Refer to Appendix I of the IRMWP for additional information regarding the CQAP.

3. Engineering Controls and Best Management Practices

This section presents ECs and BMPs to be implemented as part of the IRMWP.

3.1 Engineering Controls

3.1.1 Project Construction Area Access Controls

During construction activities, Project Construction Area access controls will be maintained at all times. Access controls will consist of existing and temporary security fencing around the Project Construction Area. In addition, manned site security will be required by the Contractor during non-working hours. Additional information regarding the site access controls is provided in the IRMWP.

3.1.2 Temporary Surface Cover System

Following clearing of scrub trees and brush, a temporary surface cover system will be installed over the portion of Parcel D to be incorporated into the Project Construction Area. The temporary surface cover will serve to minimize the potential for human contact with MGP-residuals and mitigate the potential for erosion and sedimentation runoff from the Project Construction Area.

The existing surface materials within Parcel D are generally soft due to the presence of MGP residual materials (e.g., purifier waste, ash, slag) placed in this area as fill material. The temporary surface cover system will include geotextile fabric and geogrid layers to stabilize the existing surface material as well as provide demarcation of the placed materials to support removal and restoration to pre-construction conditions (as necessary). A 24 inch thick layer of No. 2 stone will be placed over the geotextile to provide a suitable working surface.

Certain areas within the Area for Contractor Use will serve as access roads or decontamination areas (as detailed in the IRMWP). Construction details for access roads, temporary water management system containment, and the decontamination area are presented in the IRMWP.

3.1.3 Erosion and Sedimentation Controls

During construction activities, engineering controls for soil erosion and storm water runoff from the Project Construction Area will be maintained at all times. Temporary erosion and sedimentation control measures will consist of reinforced silt fencing, straw wattles, and a stabilized construction entrance. These measures will be installed in accordance with the

IRMWP and maintained in accordance with the SWPPP (included as Appendix D to the IRMWP).

3.2 Best Management Practices

3.2.1 Management of Storm Sewer Replacement Waste Materials

Management of materials anticipated to be generated during the storm sewer replacement activities will be dictated by the Waste Management Plan included as Appendix F to the IRMWP. Waste streams anticipated to be generated during the storm sewer replacement activities consist of: soil; controlled low strength material (CLSM) spoils; groundwater and storm water that enters the storm sewer trench excavation; equipment and personnel decontamination water; and miscellaneous waste. As appropriate and with NYSDEC approval, the temporary surface cover system placed within the portion of Parcel D incorporated into the Project Construction Area will remain following the completion of the storm sewer replacement activities. Parcel D is planned to be remediated in the future and the temporary surface cover will provide some protection for potential exposure to surface materials.

The following general waste management protocols will be followed for solid and liquid waste streams:

- To the extent practicable all solid wastes will be directly loaded into appropriate transportation vehicles for off-site treatment/disposal

- All liquid wastes will be transferred to an on-site staging area for containment and waste characterization prior to transportation for off-site treatment and disposal. The staging area will be constructed as specified in the IRMWP. Refer to the IRMWP for additional information regarding water management procedures.

Specific waste handling and management protocols for soil, liquid and miscellaneous waste materials are presented in the WMP (included as Appendix F to the IRMWP).

3.2.2 Materials Reuse Restrictions

No waste materials generated during the storm sewer replacement activities will be allowed to be reused for fill or other reasons on the site. All generated materials will require transportation for off-site treatment/disposal.

3.2.3 Management of Imported Fill Materials

Imported fill materials may be temporarily stockpiled within the Area for Contractor Use on Parcel D. Any fill materials imported for project use will either be used immediately or temporarily staged within a dedicated area for subsequent use. Imported fill materials will be sampled and approved prior to delivery to the site and will meet the allowable constituent levels for imported fill for Commercial or Industrial use, as presented in Appendix 5 of the NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10). Refer to the IRMWP for additional information regarding imported fill material sampling requirements and procedures.

3.2.4 Decontamination Procedures

The Contractor will be responsible for conducting decontamination activities, as necessary, for all personnel and equipment that come in contact with impacted materials at the site. The Contractor will decontaminate equipment and personnel in the appropriate designated decontamination areas.

Precautions will be taken to limit contact between the equipment and personnel performing the decontamination activities and any cleaning liquids/debris that may accumulate in the decontamination area. Refer to the IRMWP for additional information pertaining to decontamination procedures.

3.2.5 Temporary Surface Cover System Maintenance

The temporary surface cover system will be maintained throughout the course of the storm sewer replacement project. Maintenance measures will include maintaining the minimum material cover thickness and repairing structural breaches or rutting that may occur from construction equipment. Any breach of the temporary surface cover system will be repaired by the Contractor to meet the design requirements immediately upon identification of the damaged area.

4. Inspections and Notifications

4.1 Daily Inspections

The Oversight Engineer will conduct daily inspections of temporary surface cover system and erosion and sedimentation controls. Results of these inspections will be logged on inspection forms (Appendix A) to be maintained with project documentation. The inspection from will compile sufficient information to assess the following:

- Whether ECs continue to perform as designed;
- General site conditions at the time of the inspection;
- If these controls continue to be protective of human health and the environment; and
- Any required maintenance to the temporary surface cover system.

Results of the inspection including any required maintenance to any ECs including the temporary surface will be shared with the Contractor.

4.2 Notifications

Notifications will be submitted by Con Edison to NYSDEC and NYC EDC for the following reasons:

- 7-day advance notice of any proposed ground-intrusive activities pursuant to the IRMWP.

- Notice within 48-hours of any damage or defect to the temporary surface cover system that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.

- Follow-up status reports within 45 days on actions taken to respond to any emergency event requiring ongoing responsive action.

5. Post-Construction Conditions

Following completion of the storm sewer replacement project, the portion of the Project Construction Area on the Krasdale Leasehold property will be restored to pre-construction conditions. All materials placed to support the construction will be removed and disposed of off-site. The temporary surface cover system will remain in place to protect human health and the environment from exposure to the underlying soils as well as serve a construction support area for potential future work activities at Parcel D. Any impervious areas constructed in the area for contractor use (e.g., decontamination area, water management system containment area) will be removed. All infrastructure items (i.e., security fencing, access gates, etc.) will be replaced with in-kind structures.

6. Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

6.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, Con Edison should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. These emergency contact lists must be maintained in an easily accessible location at the Site when site activities are being conducted.

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility mark-out)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
Yelena Skorobogatov	(718) 204-4205

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

6.2 Directions to Nearest Health Facility

Site Location: 400 Food Center Dr Bronx, NY 10474
Nearest Hospital Name: Bronx Lebanon Hospital Center
Hospital Address: 853 Tiffany Street, Bronx, NY 10459
Hospital Telephone: 718-239-4790

Directions to the Hospital:

1. Head **NORTHWEST** on **Food Drive/Food Center Drive/Loop Road/ Market Street Avenue** toward **Halleck Street**. (go 0.5 mi)
2. Continue onto **E BAY AVE**. (go 0.5 mi)
3. Turn **RIGHT** onto **TIFFANY ST**. (go 0.7 mi)
4. Destination will be on the **LEFT**

Total Distance: 1.8 miles (about seven minutes)

* Note: Hospitals/hospital routes are subject to change and should be updated as necessary. Hospitals and hospital routes should be specified in future HASP and verified prior to starting future Site work.

7. References

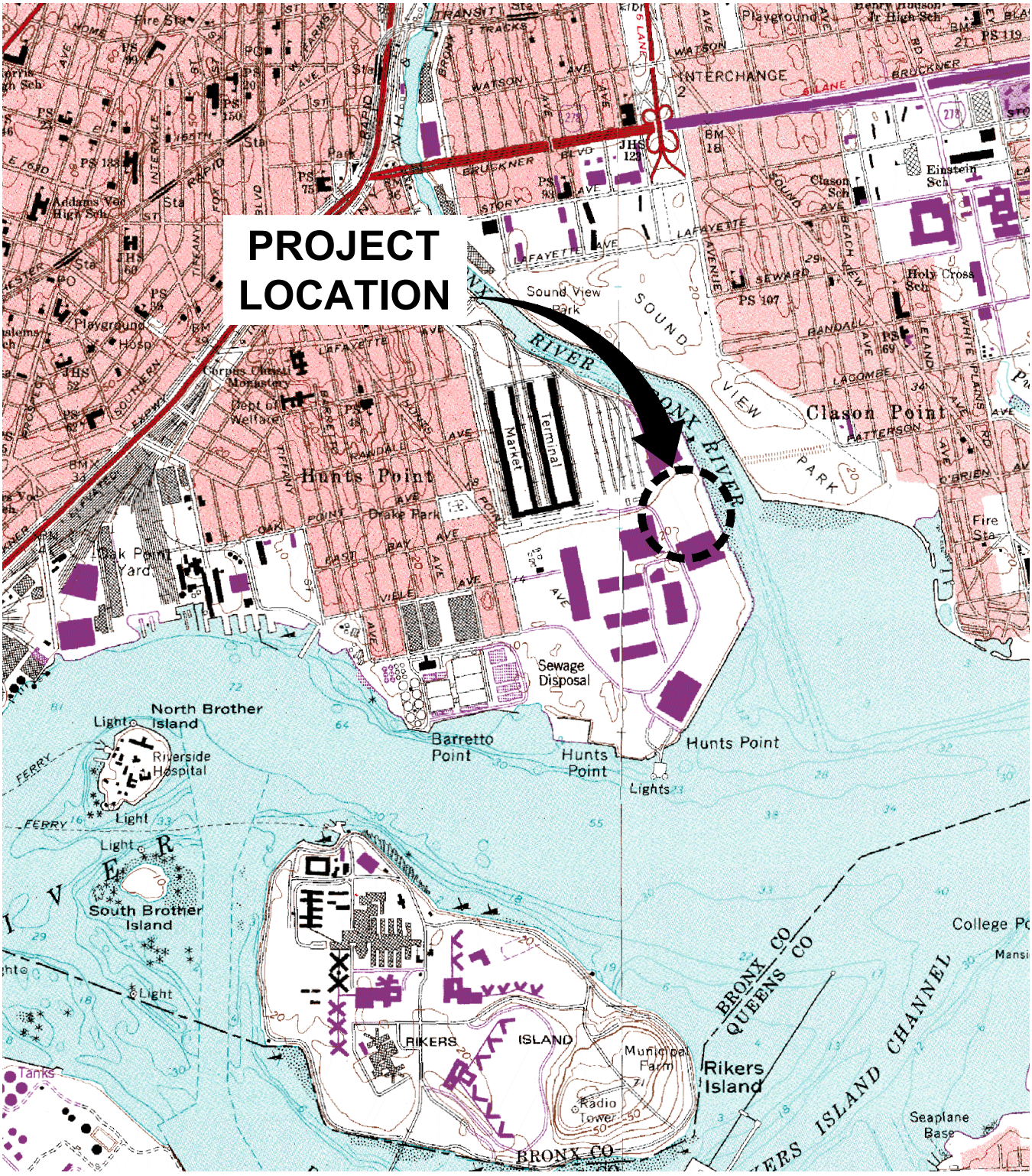
ARCADIS. 2014. Interim Remedial Measure Work Plan – Krasdale Foods, Inc., Leasehold. Hunts Point Former Manufactured Gas Plant. Consolidated Edison Company of New York, Inc. Bronx, New York. August.

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

New York State Department of Health (NYSDOH). June 2000. Generic Community Air Monitoring Plan.

ARCADIS

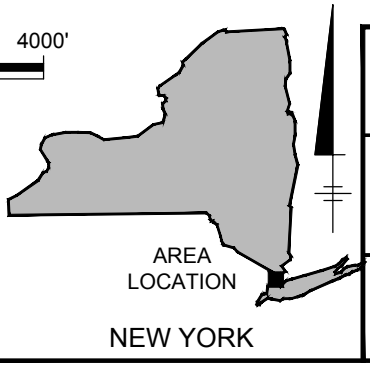
Figures



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., CENTRAL PARK AND FLUSHING, NY., 1966. PHOTOREVISED 1979.

0 2000' 4000'

GRAPHIC SCALE



CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT SITE
KRASDALE LEASEHOLD
BRONX, NEW YORK

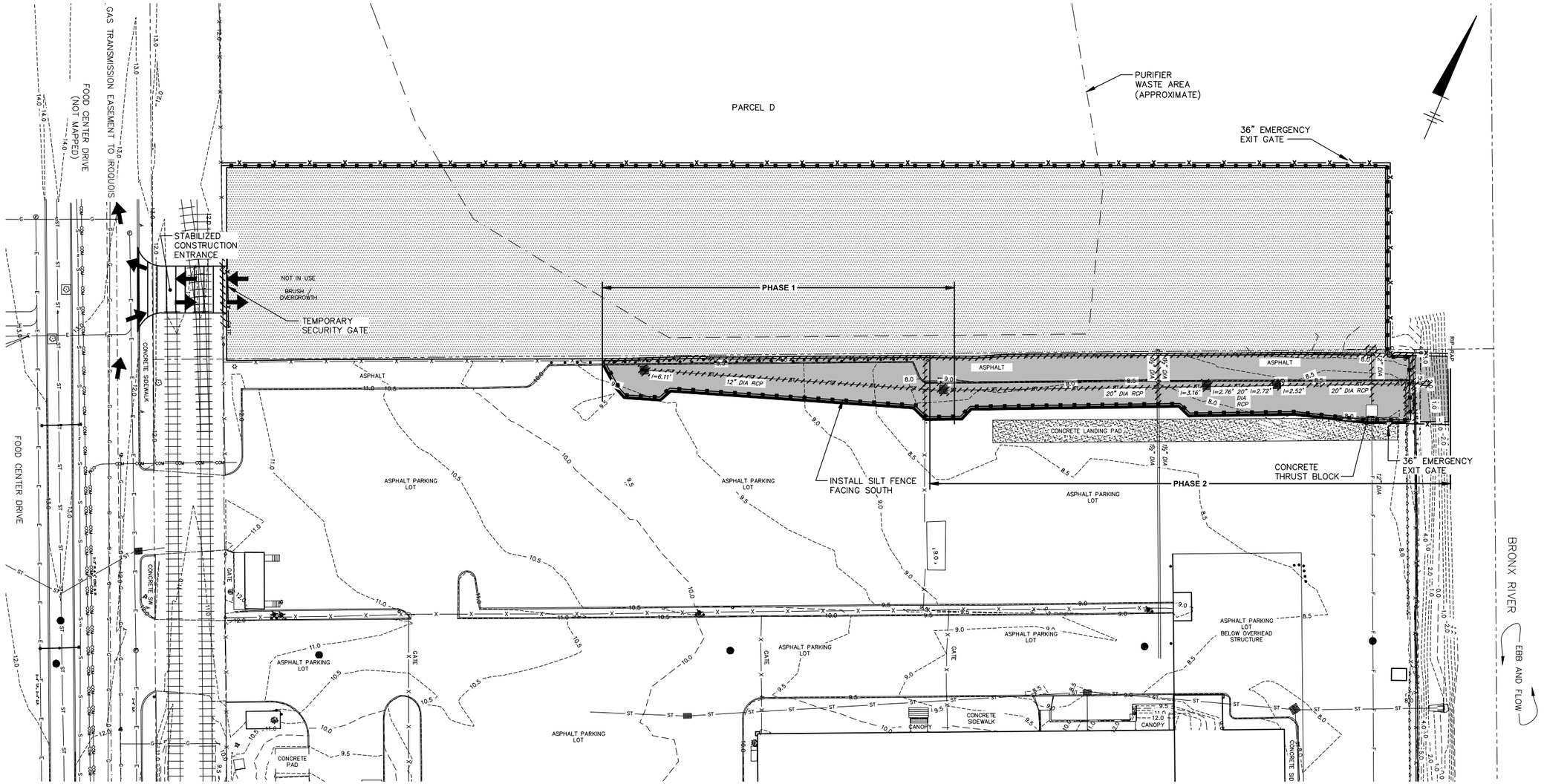
CONSTRUCTION SITE MANAGEMENT PLAN

SITE LOCATION MAP

ARCADIS

FIGURE 1

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: B.GETTS PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0043027\0005\00020\DWG\REPORT\43027G01.DWG LAYOUT: 1 SAVED: 4/2/2014 1:18 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-AP-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/2/2014 1:18 PM BY: GETTS, BRIAN
XREFS: IMAGES:
43027XAP 43027X01.TIF
43027X02.TIF



LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- EXISTING RAILROAD TRACKS
- BUILDING
- TREE
- EXISTING GRADE CONTOUR (0.5' INTERVAL)
- CONCRETE CURB
- FENCE WITH BARBED WIRE
- GUARDRAIL
- STORM SEWER LINE
- FIRE SERVICE LINE
- SANITARY SEWER LINE
- GAS LINE
- ELECTRIC LINE
- COMMUTER LINE
- OUTFALL
- CATCH BASIN
- MANHOLE
- LIGHT POLE
- HYDRANT
- VALVE
- BOLLARD
- STAND PIPE
- SIGN
- SURVEY CONTROL POINT
- CONCRETE LANDING PAD
- APPROXIMATE LIMITS OF PURIFIER WASTE ON PARCEL D
- TEMPORARY SECURITY FENCE
- TEMPORARY SECURITY GATE
- REINFORCE SILT FENCE
- CONSTRUCTION BARRIER WITH VISUAL BARRIER SCREEN
- REMOVE/DEMOLISH
- AREA FOR CONTRACTOR USE (APPROXIMATELY 620' X 100') (SEE NOTE 2)
- PROJECT WORK AREA
- CONSTRUCTION VEHICLE ACCESS

NOTES:

1. TEMPORARY LIGHTING SHALL BE USED AS REQUESTED BY OWNER OR OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL CLEAR AREA FOR CONTRACTOR USE (TO THE EXTENT NECESSARY TO PERFORM THE WORK), INSTALL PERIMETER EROSION AND SEDIMENTATION CONTROLS, AND IMPROVE GROUND SURFACE TO INSTALL THE SPECIFIED TEMPORARY FACILITIES (I.E., ACCESS ROADS, STAGING AREA, DECONTAMINATION AREA, OFFICE TRAILERS, ETC.) NECESSARY TO SUPPORT AND PERFORM THE CONSTRUCTION.
3. CONTRACTOR SHALL INSPECT THE INSTALLED TEMPORARY FACILITIES DAILY FOR CONFORMANCE WITH THE MINIMUM REQUIREMENTS PROVIDED IN THE DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE TEMPORARY FACILITIES AND IMPROVING AS NECESSARY.

0 30' 60'
GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
HUNTS POINT FORMER MANUFACTURED GAS PLANT SITE
KRASDALE LEASEHOLD
BRONX, NEW YORK
CONSTRUCTION SITE MANAGEMENT PLAN

SITE LAYOUT PLAN

ARCADIS

FIGURE 2

CITY: SYRACUSE, NY DIV/GROUP: ENV/CADD DB: G. STEINBERGER, R. BASSETT, P. LISTER, K.SARTORI PIC: J. BRIEN PM/TM: J. BALISTERI LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B0043027\0005\0020\DWG\REPORT\43027G02.DWG LAYOUT: 2 SAVED: 8/13/2014 8:01 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/13/2014 8:01 AM BY: GETTS, BRIAN
XREFS: IMAGES:
43027X01
43027X00

ARCADIS

Appendix A

Inspection Form

Hunts Point Former Manufactured Gas Plant Site
Bronx, New York

Site Inspection Form

Inspection Date: _____ Weather: _____

Inspector(s): _____ _____

_____ _____

_____ _____

Time Arrived: _____ Time Departed: _____

Inspection Item	Satisfactory	Unsatisfactory	Comments
Evaluate the condition of Engineering Controls			
Temporary Surface Cover System			
Erosion and Sedimentation Controls			
Stabilized Construction Entrance			
Site Access Controls - Existing and temporary security fencing			
Evaluate the Best Management Practices			
Management of Excavated Soils/Excavation Restrictions			
Materials Reuse Restrictions			
Management of Imported Fill Materials			
Management of Construction Contact Water			
Decontamination Procedures			
Surface Cover System Maintenance			

Additional Comments

_____

_____

_____

_____

ARCADIS

Appendix I

Construction Quality Assurance Plan

ARCADIS

Infrastructure · Water · Environment · Buildings

Consolidated Edison Company of New York, Inc.

Construction Quality Assurance Plan

Krasdale Foods, Inc., Leasehold

Hunts Point Former Manufactured Gas Plant

Bronx, New York

September 2014

Construction Quality Assurance Plan

Krasdale Foods, Inc., Leasehold
Hunts Point Former Manufactured Gas Plant
Bronx, New York

Prepared for:
Consolidated Edison Company of New York, Inc.

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017

Our Ref.:
B0043027.0000

Date:
September 2014

ARCADIS

Table of Contents

1. Introduction

1.1 Purpose

This *Construction Quality Assurance Plan* (CQAP) has been prepared by ARCADIS of New York, Inc. (ARCADIS) to support a storm sewer replacement at the Krasdale Foods, Inc., Leasehold property at Consolidated Edison Company of New York, Inc.'s (Con Edison's) former manufactured gas plant (MGP) site located at Hunts Point in Bronx, New York (the site). This CQAP describes the materials, procedures, and testing necessary for proper construction, evaluation, and documentation during implementation of the Interim Remedial Measure Work Plan (IRMWP).

1.2 Definitions and Terms

The following terms and abbreviations are used throughout this CQAP. The definition of each term or abbreviation is consistent throughout this plan.

ASTM – American Society for Testing and Materials.

Contractor – The person or persons designated by, Con Edison, to perform the storm sewer replacement work (including the excavation bracing systems and water management systems), including the person or persons hired by the Contractor to construct the components of the storm sewer replacement, and the person or persons designated by the Contractor to perform work associated with the storm sewer replacement.

Remedial Action Work Plan – Documents included as part of the IRMWP including the Design Drawings, Specifications, *Construction Quality Assurance Plan* (CQAP), *Waste Management Plan (WMP), and Community Air Monitoring Plan (CAMP)*.

CQA – Construction quality assurance.

CQC – Construction quality control.

Manufacturer – The person or persons designated by the Contractor to provide construction materials.

Owner – Con Edison

Design Engineer - Design Engineer is the office-based owner's representative designated by Con Edison who will review and approve Contractor submittals and ensure the storm sewer replacement is performed in accordance with the IRMWP.

Oversight Engineer - Oversight Engineer is the on-site owner's representative designated by, Con Edison to ensure the storm sewer replacement is performed in accordance with the IRMWP.

2. Required Personnel and Qualifications

2.1 CQA Management Organization

This section identifies the general CQA roles, qualifications, and responsibilities of Design Engineer, Oversight Engineer, and Contractor personnel, as well as Con Edison's role in the CQA process. Additional requirements are specified throughout in the Design Documents.

In general, observation, sampling, testing, and/or documentation of the installation of construction materials and associated procedures will be performed by a person or persons familiar with conventional construction procedures, materials, and the project requirements. The project personnel will be under the direct supervision of a Professional Engineer licensed in the State of New York. The Oversight Engineer will be familiar with the use of equipment and methodology needed to sample and test soil, water, and other materials.

2.2 Con Edison

Con Edison will have the final authority on all aspects of the storm sewer replacement activities. Con Edison is empowered to determine the amount, quality, acceptability and fitness of all parts of the IRMWP.

The Con Edison project manager (Con Edison) is knowledgeable of the project requirements and objectives and is familiar with the project. Con Edison will be on-site, as required, during construction activities. The responsibility of Con Edison is to review the quality of construction that meets or exceeds that defined by the Remedial Action Work Plan and identified in this CQAP.

Con Edison will have the following responsibilities in the implementation of the procedures in the CQAP:

- Attend the pre-mobilization site meeting.
- Attend periodic project coordination meetings.
- Evaluate the construction activities.
- Evaluate the CQA efforts of the Design Engineer.

- Prepare (or designate appropriate personnel to prepare) transportation manifests for the transportation of non-hazardous waste, hazardous waste, and conditionally exempt materials (i.e., soil, water, debris).

2.3 Design Engineer

The Design Engineer will have knowledge of construction, excavation support and bracing system installation/removal, excavation, pipe construction/installation, work with controlled low strength material (CLSM), and applicable test methods through a combination of formal education, training, and experience.

The Design Engineer will have the following responsibilities in the implementation of the procedures in the CQAP:

- Schedule and coordinate CQA inspection activities.
- Oversee and coordinate the QA/QC sampling and testing.
- Attend the pre-construction site meeting.
- Attend periodic project meetings.
- Attending to routine daily topics related to the overall performance of the construction activities.
- Provide the appropriate technical review (i.e., by qualified representatives of the Design Engineer) of the IRMWP, proposed modifications to the IRMWP, and construction summary report.
- Record on-site activities that could result in damage to the site and report these activities to the Contractor.
- Review and submit daily construction reports to Con Edison.
- Prepare weekly project status reports.
- Serve as the daily contact person for the Oversight Engineer.
- Maintain routine contact with Con Edison and the Contractor regarding conformance with the QC requirements presented in this CQAP.

- Review shop drawings, product data, and other submittals from the Contractor.
- Review field and laboratory QA/QC testing results for conformance with the IRMWP.
- Identify/determine areas that require rework and/or repair.
- Monitor the delivery of samples to the CQA Laboratory for testing.
- Coordinate the activities of the Oversight Engineer to establish proper sampling procedures.
- Perform regular site walkthroughs to review progress and QA/QC procedures.
- Identify noted deficiencies during the storm sewer replacement activities (based on QC testing results) so corrective actions can be taken.
- Prepare the Construction Completion Report following the completion of storm sewer replacement activities.

2.4 Oversight Engineer

The Oversight Engineer must demonstrate knowledge of construction, excavation support and bracing system installation/removal, excavation, pipe construction/installation, work with CLSM, and applicable test methods through a combination of formal education, training, and experience. The Oversight Engineer will have thoroughly reviewed the Design Drawings and Specifications and have a comprehensive understanding of the project requirements to effectively identify points of non-compliance to the Design Engineer.

The Oversight Engineer will have the following responsibilities in the implementation of the procedures in the CQAP:

- Attend periodic project meetings.
- Prepare daily construction reports.
- Assist in preparation of weekly status reports.
- Perform community air monitoring and noise monitoring in accordance with the IRMWP.

- Document that field and laboratory testing is conducted at the frequency established in this CQAP.
- Identify areas of non-conformance based upon the results of field and laboratory testing.
- Perform and document field sampling for QA/QC testing.
- Observe construction materials, such as steel, soils, piping, CLSM, and geosynthetics, delivered to the site, to determine general conformance with material specifications.
- Observe and record the procedures used for the following:
  - pre-construction activities/mobilization.
  - excavation support/bracing system installation, monitoring, and removal.
  - excavation activities.
  - pipe installation activities.
  - CLSM placement activities.
  - noise, vapor/odor suppression, and dust control.
  - decontamination of equipment and personnel.
  - waste handling, treatment and disposal
  - backfilling/restoration of excavated and disturbed areas
  - installation of the surface cover materials
  - site restoration/demobilization

2.5 Contractor Qualifications and Responsibilities

The Contractor will be trained and experienced, and demonstrate that the superintendent, field crew foreman, and subcontractors have similar experience in the construction, installation, and performance of the various components outlined in the IRMWP, including

excavation support and bracing system installation/removal, excavation, pipe construction/installation, work with CLSM, and water handling/management. The Contractor will also hire a third party firm to conduct vibration monitoring as needed during the construction activities, as specified in the IRMWP.

The Contractor will have the following responsibilities for implementing the procedures presented in the CQAP:

- Review and be completely familiar with the IRMWP.
- Maintain lines of communication with the Oversight Engineer to identify and discuss field issues as they arise.
- Coordinate with all equipment suppliers to document compliance with CQAP requirements.
- Provide Con Edison and/or the Design Engineer with at least 5 days written notice of any tests or inspections required by the IRMWP; timely notice of all other tests and inspections and an additional 48 hours notice prior to the actual performance of any test or inspection.
- Prepare and submit to the Design Engineer, all shop drawings and required submittals specified in the Design Documents.
- Identify any potential design and/or construction issues as early as possible to allow resolution in a manner that will not impact the quality of the construction or the schedule of construction activities.
- Maintain a continuous record of any approved changes or modifications to the IRMWP.

2.6 Contractor Surveyor Qualifications

All surveys necessary for implementation of storm sewer replacement and for the collection of as-built information will be carried out by personnel practiced in land survey techniques and under the direction of a New York State-licensed Land Surveyor.

3. Documentation Requirements

3.1 Documentation

The documentation of CQA activities will support a determination of whether construction activities have been carried out in general accordance with the IRMWP. The documentation process includes recognition of construction tasks that will be observed and documented; assignment of responsibilities for the observation, testing, and documentation of these tasks; and the completion of the required reports, data sheets, forms, and checklists to provide an accurate record of the work performed during the storm sewer replacement.

3.1.1 Daily Construction Reports

The Oversight Engineer will complete a daily summary report of each day's construction activities. The daily construction reports will be submitted the following business day in an electronic format to Yelena Skorobogatov, Con Edison Project Manager at SkorobogatovY@coned.com. The daily construction reports will contain, at a minimum, the following information:

- Date, project name, location, and the number and names of people on site.
- Time that work starts and ends, in addition to the time of work stoppages related to inclement weather, or insufficient equipment or personnel or other reasons.
- Data on weather conditions, including temperature, humidity, wind direction and speed, cloud cover, and precipitation.
- Summary information regarding community air monitoring results.
- Contractor's workforce, equipment, and materials delivered to or removed from the job site.
- Chronological description of work in progress, including notices to or requests from the Contractor and/or installer.
- A description of any health and safety issues.
- Results of testing performed on site.
- Problem/deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this CQAP.

- A listing of laboratory samples collected, marked, and delivered to the CQA/CQC Laboratory.

- A record of pertinent communications with other on-site parties, outside companies, regulatory agencies, or consultants regarding the day's construction activities.

- A record of calibrations or standardizations performed on field testing equipment, including actions related to the results of recalibrations.

3.1.2 Problem/Deficiency Identification and Corrective Action Documentation

Daily construction reports prepared by the Oversight Engineer will include documentation of problems and/or deficiencies noted during construction (e.g., when construction material or activity is observed or tested that does not meet the requirements set forth in the IRMWP), and corrective action employed by the Contractor to address the problems or deficiencies. The documentation reports will be cross-referenced to the reports, data sheets, forms, and checklists that contain data or observations leading to the determination of a problem or deficiency. Problem and deficiency identification and corrective action documentation may include the following information:

- A description of the problem or deficiency, including reference to supplemental data, or observations related to the determination of the problem or deficiency.

- Location of the problem or deficiency, including how and when the problem, or deficiency was discovered.

- The corrective action taken for resolving the problem or deficiency. If the corrective action has already been implemented, observations, and documentation showing that the problem or deficiency was resolved should be included. If the problem or deficiency has not been resolved by the end of the day upon which it was discovered, the documentation will state that the deficiency was unresolved at the end of the day.

If the problem or deficiency has not been resolved, then Con Edison and the Project Manager will discuss the corrective actions necessary to resolve the problem or deficiency as soon as possible.

3.1.3 Health and Safety Accident Reports

In the event of any accident occurring on-site during the storm sewer replacement, Con Edison's *Contractor Injury Form* and an appropriate incident/near miss investigation report will be completed by affected personnel. The Design Engineer and Con Edison will be

contacted in the event of an accident. The health & safety accident report sheets are attached to the Health and Safety Plan and will be located in the field project trailer.

3.1.4 Daily Construction Site Management Plan Inspection Form

The Oversight Engineer will prepare a daily construction site management plan (CSMP) inspection form to document the condition of the engineering controls and best management practices presented in the Construction Site Management Plan.

3.1.5 Weekly Stormwater Pollution Prevention Plan Inspection Reports

The Oversight Engineer will complete a weekly inspection report that summarizes the results of erosion and sedimentation control inspections (as described below in Subsection 4.1). Refer to Specification Section 31 25 13 - Erosion and Sedimentation Controls for the minimum requirements of the weekly erosion and sedimentation control inspection reports.

A copy of the inspection report will be provided to Con Edison once a week.

3.1.6 Transportation Log

The Oversight Engineer will prepare a transportation log to record all loads of solid or liquid waste that are transported off-site. The transportation log will remain in the office during construction activities.

3.1.7 Photographic Documentation

The Oversight Engineer will document observations, problems, deficiencies, and work in progress. Photographs will be in color print format and will be filed in chronological order in a permanent protective file and computer storage system.

The following information will be documented in the daily report or a logbook for each photograph:

- Date and time
- Location where photograph was taken
- Description of subject matter.

3.1.8 Construction Submittals

The Contractor shall prepare and submit all submittals required in the IRMWP consistent with the procedures provided in Specification Section 01 33 00 – Submittals. Information contained in the Contractor's submittals that is not applicable to the specification furnished should be clearly lined out or deleted. The Contractor's submittals must be easily legible, clean, and clearly reproduced.

All required submittals shall be reviewed by the Design Engineer for conformance with the requirements presented in the IRMWP. The Contractor will not be permitted to perform any activity that directly or indirectly involves the item or items covered by a submittal until a "reviewed" or "reviewed and noted" stamp is provided by the Design Engineer.

The Design Engineer's review shall in no way be construed as permitting departure from the IRMWP, except where the written request by the Contractor and written acceptance by the Design Engineer and Con Edison for such departure is provided. The Design Engineer's review does not relieve the Contractor of any responsibility to comply with applicable laws, rules, regulations, or agreements.

3.1.9 Construction Completion Report

A *Construction Completion Report* will be prepared by the Design Engineer at the end of construction. The report will meet the requirements of New York State Department of Environmental Conservation (NYSDEC) DER-10, and at a minimum, contain the following information:

- Record Drawings showing the installation of each construction material as it relates to the plan views and individual details.
- Correspondence with the NYSDEC and others, as deemed relevant to the storm sewer replacement activities.
- A summary of field observations and tests performed, laboratory samples collected, and test results reported.
- A summary of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies discovered.
- Documentation indicating that acceptance criteria were met, including a comparison of documented procedure data with the IRMWP.

A summary and documentation of all waste streams generated as part of the project, including final treatment/disposal destination and volumes/weights (as appropriate).

3.2 Project Meetings

Daily, weekly, and monthly site safety inspections and project coordination/progress meetings may be attended by an NYSDEC representative for the duration of the construction activities. A brief description of the site meetings and inspections/reviews to be conducted are presented below.

3.2.1 Pre-Construction Meeting

Following award of the contract and prior to Contractor mobilization, a pre-construction meeting will be held at the site to introduce project team members representing the Contractor, Con Edison, the Oversight Engineer, and the NYSDEC. The meeting will be scheduled by Con Edison shortly after the award of the Contract. The meeting will be conducted to review Contract requirements, establish a detailed schedule of operations, and resolve issues (if any) raised by the attending parties.

The Oversight Engineer will prepare a summary of the pre-construction meeting. A copy of this summary will be provided to each of the parties in attendance. Failure by the Contractor to inform Con Edison, within 7 days of receiving this summary, of any discrepancies or inaccuracies contained therein indicates that the Contractor concurs with the Oversight Engineer's summary of the meeting.

3.2.2 Daily Site Safety and Coordination Meetings

Daily meetings will be attended by the Contractor's on-site project foreman, the Oversight Engineer, Con Edison (as necessary), and other parties to be on site during the day to discuss day-to-day operations, daily schedule, health and safety issues, Contractor coordination issues, and general project status.

3.2.3 Periodic Progress and Coordination Meetings

Periodic progress and coordination meetings will be held on-site at least weekly for the duration of the project. Participants in these meetings will include on-site representatives of the Contractor, responsible managers of the Contractor's firm (as requested by the Oversight Engineer), Oversight Engineer, and the Project Manager. Con Edison and the NYSDEC also may attend some or all of the weekly progress and coordination meetings. Weekly progress and coordination meetings will be held to discuss issues, including, but not limited to, project status, schedule, scope of work, and overall project implementation.

Site inspections/reviews will be conducted by Con Edison and/or Oversight Engineer as part of the periodic progress and coordination meetings prior to, during, and at the completion of the storm sewer replacement activities. The weekly progress and coordination meetings will be scheduled by the Design Engineer.

3.2.4 Project Close-Out Meeting

A project close-out meeting will be held at the end of the storm sewer replacement activities. Participants in the meeting will include the Contractor, Con Edison, the Oversight Engineer, the Design Engineer, and the NYSDEC. The meeting will be scheduled by the Con Edison project manager. As part of the meeting, a final site inspection will be conducted by the attendees. Refer to Specification Section 01 77 00 – Closeout Procedures for closeout requirements.

4. Pre-Construction Activities/Mobilization

4.1 General

This section describes the construction and testing procedures for the activities that will take place prior to the start of construction, including: erosion and sedimentation control measure installation; access road construction, and staging, equipment laydown, and decontamination areas construction.

4.2 Pre-Construction Surveys

An initial site survey will be performed by the Contractor's surveyor to document existing (pre-construction) site conditions. During these activities, the surveyor will also establish survey control for the proper construction, documentation, and testing of subsequent work activities (e.g., sheet pile installation, excavation, restoration, etc.). The Oversight Engineer will document, through visual observation, that survey activities are performed in accordance with Specification Section 01 71 23 – Survey and survey documentation conforms to the requirements of Specification Section 01 78 39 – Construction and Record Drawings. The Oversight Engineer will also obtain photographic documentation of pre-construction conditions prior to the initiation of construction activities.

4.3 Erosion and Sedimentation Control Measures

Prior to the start of the storm sewer replacement activities, erosion and sedimentation control measures will be constructed/installed/placed by the Contractor in general accordance with the Stormwater Pollution Prevention Plan (SWPPP) presented in the IRMWP.

4.4 Temporary Site Security Measures

Temporary site features and site security measures (e.g., fencing, signage, etc.) will be installed by the Contractor. The Oversight Engineer will document, through visual observation, that temporary site security measures are installed, inspected, and maintained by the Contractor in accordance with Specification Section 01 14 13 – Site Security and Access.

4.5 Access Roads, Water Management System Containment, Equipment Lay Down, and Decontamination Areas

Prior to the start of the storm sewer replacement activities, the Contractor will construct support areas including, but not limited to, access roads, water management system

containment, equipment lay down, and equipment/personnel decontamination areas. The Contractor will be responsible for submitting to the Design Engineer a figure identifying the proposed locations of access roads, staging, equipment laydown, and decontamination areas for approval prior to initiating material excavation activities.

As indicated in the Design Drawings, the area designated for Contractor use will require clearing and ground surface improvement consistent with the access road and staging area details.

4.6 Temporary Surface Cover System

The Contractor shall determine the limits of the Area for Contractor Use necessary to perform the work. Once the limits have been determined, the Contractor shall install a temporary surface cover system over any area to be used as part of the construction. The Oversight Engineer will document and identify any points of non-compliance with the CSMP.

4.7 Utility Identification

Prior to storm sewer replacement activities, the Oversight Engineer will document, through visual observation, the following:

- Dig Safely New York is contacted by the Contractor and the utility clearance is completed prior to the initiation of any intrusive activities.

- Utility locations/alignments are marked-out on the ground.

The locations, alignments, and construction of utilities shown on the Design Drawings are approximate and based on information available to Con Edison and the Design Engineer. Any differences identified by the Contractor between the utilities shown on the Design Drawings and those encountered in the field will be brought to the immediate attention of Con Edison and the Design Engineer.

CQA Observations

The Oversight Engineer will observe installation activities to document that they are being performed in accordance with the IRMWP and report non-conformances to the Design Engineer.

5. Water Management System

5.1 General

As indicated in the IRMWP, the Contractor will install, operate, monitor, and maintain a temporary on-site water management system as part of the storm sewer replacement. The water management system will be constructed and tested as indicated in this Section.

5.2 System Operations

The Contractor will install the water management system within a containment area in accordance with the Specification Section 31 23 00 – Excavation and Dewatering. The Contractor is responsible for all operation, monitoring, and maintenance activities throughout the water management process including (but not limited to):

- Maintaining of the containment area.
- Pumping water from various collection points (e.g., excavation, staging, and decontamination areas) into the Influent Equalization Weir Tanks.
- Treating collected water for particulates.
- Transferring filtered water to the Effluent Holding Tanks.
- Managing filtered water for off-site transportation and disposal to a licensed and Con Edison-approved facility in accordance with Specification Section 01 74 19 – Off-Site Disposal.

CQA Observations

The Oversight Engineer will observe process equipment installation activities to document that equipment and construction activities are in accordance with Specification Section 31 23 00 – Excavation and Dewatering.

Contractor CQA Submittals

The Contractor will be responsible for the following CQA submittals including (but not limited to):

- Technical details relating to the construction and maintenance of the containment area.

- Cut sheets and specifications for each system component.
- Equipment weight, dimensions, and materials of construction for all system components.
- Pumping and piping types, sizes, and connections.
- Electrical requirements and service connections.
- Operation and control diagrams.
- Location of system components within Work Area.
- Material Safety Data Sheets (MSDSs).
- Written record of the daily operation and maintenance activities associated with the water management system, including.
  - Hours of operation.
  - Volume of water extracted and transferred for off-site transportation and disposal.
  - Transportation and disposal facilities used.
  - Type and frequency of monitoring and maintenance activities (if any).
  - Other information relevant to the operation, monitoring, and maintenance of the water management system.

6. Excavation Support

6.1 General

Sealed temporary steel sheet piling will be installed to facilitate trench excavation support for the new storm sewer, as indicated on the Design Drawings. Additionally, timber lagging will be used at the concrete pipe removal area.

6.2 Sheetpile Manufacturing and Delivery

This subsection describes the CQA procedures applicable to the steel sheetpile manufacturing and finished sheetpile delivery to the site prior to installation.

6.2.1 Material Specifications

The temporary steel sheet piles and joint sealant used for support of the trench excavation will conform to the Contract Drawings and Specification - Section 31 50 00 - Excavation Support.

6.2.2 Quality Control Requirements

Contractor CQA Submittals

Prior to the delivery of the sheet piling to be supplied by the Contractor to the site, the Contractor will provide the Design Engineer with, at a minimum, the certified mill test and material certification reports. The Contractor may also be required to provide the Design Engineer with additional documentation as required by the IRMWP. The following additional items will be received from the Contractor prior to the start of sheetpile installation:

- Number of years continuously engaged in sheetpile installation and summaries of representative project experience.

- Resumes for key Contractor/subcontractor personnel, including project manager, on-site superintendent/foreman, on-site health and safety officer, and equipment operators.

- List of equipment (including cut sheets) anticipated to be used for the installation of the sheet piling. For the sheetpile installation, the Contractor will include certification that each pile hammer delivered to the site is suitable for the anticipated conditions, including with regard to impact energy, static weight, and overhead clearance.

6.2.3 Delivery, Handling, and Storage of Sheet Piling

Sheet piling supplied by the Contractor shall be inspected by the Contractor, cleaned of rust and/or dirt, as necessary, covered and protected from weathering. Sheet pile panels shall be stored to adequately protect them from equipment damage. The Contractor will provide a log of the sheet piles used. Timber lagging is to be supplied by the Contractor.

Sheets obtained by the Contractor and delivered to the site will be unloaded and stored in a secure, dry area, where it is protected from weathering.

Each sheetpile section will be marked with the following information (on a durable gummed label, or equivalent):

- Sheet pile provider.
- Steel grade and identification number (if any).
- Pile length and width.
- Nominal product thickness.
- Identification number.

The following practices will be used, at a minimum, in receiving and storing the sheet piles in the designated storage area at the site:

- Unloading or transfer from one location to another will be performed in such a manner as to prevent damage to the sheet piles.
- Sheet pile panels will be stored to adequately protect them from equipment damage.

Unless otherwise specified in the IRMWP, the Contractor will be responsible for the means and methods to implement the work. The Contractor will be responsible for ensuring that all materials installed meet specifications (i.e., that the label information on the panels properly represent materials and meet the required specifications). The Design Engineer will maintain a log of sheet pile deliveries.

CQA Observations

The Oversight Engineer will observe and document, throughout the pre-installation, installation, and post-installation periods, that the installer is providing adequate handling equipment for moving sheet piles and that the equipment and the handling methods used do not pose unnecessary risk of damage. The Oversight Engineer will report non-conformances to the Design Engineer.

6.3 Pre-Installation Requirements

CQA Observations

Prior to installation of sheet piling, the Oversight Engineer will check the following and note observations in the daily construction report:

- Line and grade of sheet pile wall.
- Condition of timber lagging
- Actual pile lengths
- Special piles (i.e., corner piles) are labeled as such
- Pile installation method to be utilized will not damage the sheet pile or any nearby structures
- The locations of obstructions (or potential obstructions) have been verified by the Contractor through trenching and adequate removal has occurred to facilitate sheet pile installation
- Vibration monitoring systems have been installed and the systems are operating properly.

6.4 Sheet Pile Wall, Bracing, and Joint Sealant Installation

The sheet piles will be driven using a vibratory or other non-impact method in accordance with the methods and equipment recommended by the manufacturer of the sheet piling. All sheet piling will be installed vertically to the elevations indicated in the IRMWP. Care should be taken to establish that piles are plumb prior to installation. Leads, templates, or timber bracing shall be used for guiding the piles during driving.

CQA Observations

During installation of sheet piling (and timber lagging), the Oversight Engineer will monitor for irregularities and indications that the pile is out of plumb. Such instances will be reported to the Design Engineer. If deficiencies cannot be corrected, the pile will be pulled and a new pile driven. The Contractor shall provide the Oversight Engineer documentation of the depth to which each sheet pile is driven and that joint sealant has been applied in accordance with the manufacturer's specifications.

A sheet pile driving record will also be maintained by the Oversight Engineer during the installation of the steel sheet piling. Each sheet pile will be numbered and its location recorded. The installation log will include the sheet pile length, method for installation, approximate penetration rate, condition of joint sealant, and final sheet elevation.

6.4.1 Temporary Joint Sealant Application

Prior to installation of the perimeter sheet piling, the Contractor will apply joint sealant to minimize the seepage of groundwater through the sheet pile joints and into the excavation areas.

CQA Observations

The Oversight Engineer will document the methods employed by the Contractor, will inspect the sealant prior to installation, and will notify the Design Engineer if the system is not working effectively during excavation and dewatering activities. Any deficiencies in the joint sealant will be repaired by the Contractor. If sheet piling is pulled and re-driven during installation, the Contractor shall remove existing sealant and reapply joint sealant prior to re-driving.

6.5 Post-Installation Requirements

Following sheet pile installation activities, monitoring activities will continue, as described below.

CQA Observations

During excavation and backfilling activities, the Oversight Engineer will inspect the sheet pile alignment and ground surface (up to 40 feet) behind the wall and inside the excavation area. Observations will be noted and reported promptly to the Design Engineer and will include at a minimum observations of:

- Movement/cracking of the ground surface behind the sheet pile wall
- Visually observed deflection of the sheet piling
- Movement/settlement of the ground surface behind the sheet pile wall
- Liquefaction of the excavation bottom (sand boils)
- Excessive heaving of the ground surface inside the excavation area and immediately behind the sheet pile wall

The Oversight Engineer will also monitor the seepage of water through the interlocks (and lagging) during excavation activities. These observations will be documented in the daily construction report, and the Design Engineer will be notified immediately if excessive leakage (as determined by the Oversight Engineer) is occurring.

6.6 Decontamination of Excavation Support System

Following completion of excavation activities and removal of the excavation support system, the Contractor will decontaminate the components of the support system. This will be performed in accordance with Section 9 of this document.

CQA Observations

The Oversight Engineer will observe and document the equipment and support structure decontamination procedures are being performed in accordance with the IRMWP and report non-conformances to the Design Engineer.

7. Excavation and Pipe Installation

7.1 General

Excavation activities will be performed by the Contractor in accordance with the IRMWP. All removed soil, non-aqueous phase liquid (NAPL) (if any), purifier waste, debris and water will be handled in accordance with the Waste Management Plan (WMP) and Specification Section 01 74 19 – Off-Site Disposal.

7.2 Soil Excavation

Soil excavation will be performed in general accordance with the following Specification Sections:

- Section 01 71 23 – Survey.
- Section 31 23 00 – Excavation and Dewatering.
- Section 31 50 00 – Excavation Support.

The excavation areas and excavation support system are shown in the Design Drawings.

CQA Observations

The Oversight Engineer will observe excavation activities to document that they are being performed in accordance with the IRMWP, and report non-conformances to the Design Engineer. During excavation activities, the Oversight Engineer will also observe and document the effectiveness of dewatering activities.

Throughout excavation activities, the surveyor (contracted by the Contractor) will measure the excavation elevations, and the Oversight Engineer will document that the appropriate removal elevation has been achieved.

7.3 Excavation Dewatering

Excavation dewatering will be completed in general accordance with the following Specification Sections:

Section 01 71 23 – Survey.

Section 31 23 00 – Excavation and Dewatering.

Section 31 50 00 – Excavation Support.

CQA Observations

The Oversight Engineer will observe dewatering activities are being performed in accordance with the IRMWP and report non-conformances to the Design Engineer.

8. Pipe Installation

8.1 Storm Sewer Pipe Installation

Installation of the storm sewer pipe will be completed as shown on the Design Drawings and in general accordance with the following Specification Sections:

- Section 03 00 05 – Concrete
- Section 33 05 05 – Buried Piping Installation
- Section 33 05 14 – High Density Polyethylene (HDPE) Catch Basins
- Section 40 05 33 – High Density Polyethylene (HDPE) Pipe

CQA Observations

The Oversight Engineer will observe installation activities to document that they are being performed in accordance with the IRMWP and report non-conformances to the Design Engineer.

8.2 Storm Sewer Pipe and Catch Basin Testing

Testing of the storm sewer pipe and catch basins will be conducted in general accordance with the following Specification Sections:

- Section 33 05 05 – Buried Piping Installation
- Section 33 05 14 – High Density Polyethylene (HDPE) Catch Basins
- Section 40 05 33 – High Density Polyethylene (HDPE) Pipe

Testing includes exfiltration testing, vertical deflection testing, and a visual examination of all welds.

Testing of the concrete used for the catch basin and piping installation will be tested in general accordance with the following Specification Section:

- Section 03 00 05 – Concrete
- Section 31 23 10 – Fill Materials

Testing will be done by an independent testing laboratory and will meet all the requirements of Specification Section 03 00 05, Part 3.9, Field Quality Control.

8.3 Fire Loop Installation

Installation of the fire loop pipe will be completed as shown on the Design Drawings and in general accordance with the following Specification Sections:

- Section 03 00 05 – Concrete
- Section 33 05 05 – Buried Piping Installation

CQA Observations

The Oversight Engineer will observe installation activities to document that they are being performed in accordance with the IRMWP and report non-conformances to the Design Engineer.

8.4 Fire Loop Pipe Testing

Testing of the fire loop pipe will be conducted in general accordance with the following Specification Sections:

- Section 33 05 05 – Buried Piping Installation

Testing includes hydrostatic testing.

Testing of the concrete used for the thrust block will be tested in general accordance with the following Specification Section:

- Section 03 00 05 – Concrete

Testing will be done by an independent testing laboratory and will meet all the requirements of Specification Section 03 00 05, Part 3.9, Field Quality Control.

9. Decontamination Activities

9.1 General

The Contractor will decontaminate (as necessary) all personnel and equipment that has come into contact with excavated materials at the site in accordance with the IRMWP. The Contractor will conduct decontamination of personnel and equipment within constructed decontamination area(s).

9.2 Decontamination Activities

As part of everyday activities, the Contractor will provide a personnel decontamination area (as specified in the Contractor's Health and Safety Plan [HASP]). The personnel decontamination area (within the contamination reduction zone) will include those facilities necessary to decontaminate personnel upon exit of the work area (Exclusion Zone), in accordance with the Contractor's HASP, and in accordance with local, state, and federal laws and regulations.

The Contractor will establish procedures for decontamination of all vehicles and equipment used for construction activities. These procedures will be reviewed by Con Edison and the Design Engineer prior to initiation of construction activities. Visual observation of the equipment will be performed by the Contractor. This observation will occur while the equipment is positioned in the Decontamination Area. Any visible soils or other debris will be promptly removed and disposed in a manner consistent with materials excavated.

Unless otherwise directed by Con Edison or the Oversight Engineer, any equipment to be taken off-site will be subject to final visual observation and decontamination (if necessary) at a designated Decontamination Area. In general, this area will consist of an impermeable barrier which shall be sloped to a collection sump. The Decontamination Area(s) will be constructed in accordance with the IRMWP. Precautions shall be taken to limit contact between the equipment, personnel performing the decontamination activities, and any decontamination liquids that may accumulate in the decontamination area. The Contractor shall be responsible for constructing and maintaining the decontamination area to accommodate all loads, equipment, and migration scenarios. The Contractor will dismantle and properly dispose all materials associated with the decontamination area and will restore the area to its original conditions.

The extent and method of decontamination will be at the discretion of the Contractor; however, equipment and materials will be observed by the Oversight Engineer prior to its departure from the Decontamination Area. In addition, Con Edison and/or the Oversight Engineer reserves the right to require additional decontamination if deemed necessary.

Wash water, solids, and other materials generated during equipment cleaning/ decontamination shall not contact native soils or existing facilities, and will be collected by the Contractor and transferred to the temporary water management system. Disposal of collected wash water, solids, and other materials shall be in accordance with the IRMWP and Specification Section 01 74 19 – Off-Site Disposal.

Personnel engaged in vehicle decontamination will use personal protective equipment including disposable clothing in accordance with the Contractor's HASP.

Should vehicles be required to transport materials over site roadways or roadways traversed by local traffic, it is imperative that these roads be kept free of any potentially impacted as well as non-impacted soils due to Contractor's operations. All Contractor vehicles will be carefully loaded to minimize the potential for potentially impacted materials outside of the excavation areas.

CQA Observations

The Oversight Engineer will observe decontamination activities to document that the following activities (at a minimum) are completed in accordance with the IRMWP and Contractor's HASP:

- Project equipment (including excavation equipment, steel sheeting, trucks, pumps, hand tools, etc.) that comes in contact with excavated materials is decontaminated prior to demobilization from the site and prior to handling non-impacted material.

- No visible soil, sediment, debris, or stains are present on the equipment surfaces (to the satisfaction of the Oversight Engineer).

- Equipment such as pumps are flushed using clean water and appropriate cleaning agents, as necessary (to the satisfaction of the Oversight Engineer).

- Solids and other materials generated during equipment cleaning requiring off-site treatment/disposal are collected and placed into appropriate waste containers for characterization (as appropriate) and off-site disposal in accordance with the IRMWP and Specification Section 01 74 19 – Off-Site Disposal.

9.3 Decontamination of Excavation Support Systems

Following completion of backfill activities and removal of the excavation support system, the Contractor will decontaminate the components of the support system. This excavation support system decontamination will be completed by the Contractor in accordance with this CQAP and the IRMWP.

CQA Observations

The Oversight Engineer will observe and document decontamination procedures of the excavation equipment and support structures.

10. Waste Handling, Treatment and Disposal

The Contractor shall arrange for proper handling, treatment, and disposal of waste materials including, but not limited to, soil, water, NAPL, purifier waste, debris, and miscellaneous wastes generated during the storm sewer replacement in accordance with the IRMWP and all applicable federal, state, and local regulations.

CQA Contractor Submittals

Refer to Specification Section – 01 74 19 – Off-Site Disposal for submittal requirements.

10.1 Loading of Materials for Transportation

Materials will be direct loaded with an excavator into dump trucks for transportation to Con Edison-approved and permitted disposal facilities. The Contractor will place polyethylene sheeting will be placed between the dump truck and excavations during material loading activities to retain any spilled materials. Following completion of loading each truck the spilled material will be returned to the excavation.

CQA Observations

The Oversight Engineer will visually inspect the loading area to confirm that impacted material that collects on the polyethylene sheeting is removed from the area.

11. Site Restoration

11.1 General

Following completion of excavation activities, the Contractor shall backfill the trench excavation, restore disturbed areas, and demobilize labor, equipment, and materials from the site in accordance with the IRMWP. Site restoration activities shall include repairing pavement (to the satisfaction of the site owner) and completing final grading of disturbed areas. Site restoration and demobilization activities shall be completed and tested as indicated below.

11.2 Backfilling

Refer to Specification Section – 31 23 10 – Fill Materials for submittal requirements.

CQA Contractor Submittals

Contractor submittal requirements for backfilling activities and proposed fill materials are presented in Specification Section 31 23 10 – Fill Materials. Such submittal requirements include, but are not limited to, the following:

- Name and location of the source of each proposed fill material.
- Laboratory test report for each proposed fill material.
- Results of in-place density tests performed on fill materials.

CQA Observations

The Oversight Engineer will observe the backfilling activities in the excavation areas to document that the following activities are completed in accordance with the IRMWP, including (but not limited to):

- Backfilling is performed in accordance with Specification Section – 31 23 10 – Fill Materials.
- Backfill materials (i.e., CLSM and General Fill) meet the specified requirements.
- Material is placed and compacted in 1-foot lifts in accordance with the IRMWP.

- In-place density tests are performed at a frequency of one per 200 cubic yards of backfill placed or 75 linear feet of pipeline backfilled for each lift placed or to reliably and consistently determine the compaction level being achieved.

- Compacted surface of material is smooth and free of any loose stones, protrusions, and other sharp objects or foreign matter.

- Material placed within an excavation area contains the optimum moisture content.

- Any settlement occurring in the backfilled areas is refilled and compacted.

11.3 Surface Restoration

Following backfilling activities, excavation areas will be restored to the final grades and conditions indicated in the IRMWP.

CQA Observations

Prior to the start of construction, the Oversight Engineer will obtain photographic documentation of pre-construction conditions in all areas that are indicated to be restored to pre-construction conditions within the IRMWP.

The Oversight Engineer will observe surface restoration activities to document that restoration is completed in accordance with latest edition of NYSDOT Standard Specifications and/or the NYS Standards and Specifications for Erosion and Sedimentation Control (NYS E&SC Manual), as applicable, and the following activities (at a minimum) are completed in accordance with the IRMWP:

Asphalt Surface Cover:

- The sub-grade is shaped to line and grade and compacted in accordance with the IRMWP.

- All depressions that develop in the sub-grade under rolling are filled with acceptable material and re-rolled.

- Soft areas of the sub-grade are removed and filled with acceptable material and re-rolled.

- Should the sub-grade become rutted or displaced prior to placing geotextile, it will be re-worked to bring to line and grade.

- Compaction requirements are performed consistent with Specification section 32 12 00 – Flexible Paving.

- The sub-base material is placed to the minimum required thickness, in accordance with the IRMWP.

- The final surface material is placed to the minimum required thickness, in accordance with the IRMWP.

- The final surface material is shaped to line and grade and lightly compacted in accordance with the IRMWP.

11.4 Electrical Restoration

Electrical operational testing shall be demonstrated to the Oversight Engineer prior to acceptance. Operational Quality Control shall be as specified in Section 26 05 05 – General Provisions for Electrical Systems.

12. Demobilization

The Contractor will demobilize from the site following completion of all remediation activities. Demobilization activities will include, at a minimum, the following:

- Cleaning/decontaminating equipment and construction-related materials prior to removal from the site.
- Dismantling the work area(s), staging area(s), containment area(s), and equipment decontamination area(s).
- Disposing of staging, containment, and decontamination area construction materials in accordance with the IRMWP.
- Removing from the site, all materials, equipment, and support structures.

CQA Observations

The Oversight Engineer will observe the Contractor demobilization activities to document that the following activities were completed in accordance with the IRMWP:

- Equipment and construction-related materials have been cleaned/decontaminated prior to demobilization from the site.
- Work area(s), staging area(s), containment area(s), and equipment and personnel decontamination area(s) have been dismantled.
- All Contractor materials, equipment, and support systems have been removed from the site.