From: Snyder, PJ
To: Spellman, John (DEC); Beam, Steve A
Subject: RE: EXT || FW: Schenectady Update, Site 447053
Date: Friday, February 18, 2022 8:16:44 AM

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John,

The OU2 design documents have been issued For Bid and are currently being reviewed by NG procurement. We hope to have a Contractor selected in 4-6 months. The documents are available at the link below for your review.

https://geiconsultants.sharefile.com/d-sd8973bd69928429cab3ddd95c23ecfd3

The OU2 100% design is progressing. I have been reviewing edits as they are expect that will continue. I have also drafted a response to your comments. We will continue plugging away at the 100% design over the next couple of weeks. I hope to spend a good chunk of next week on it as well.

Please let me know if you have any questions or if you have trouble accessing the files from the link above.

Thanks,
PJ

GEI
PJ SNYDER, P.E. (MA, NY)
Senior Project Manager
607.216.8975 cell: 781.424.9929
1301 Trumansburg Road, Suite N, Ithaca, NY 14850

From: Spellman, John (DEC) <john.spellman@dec.ny.gov>
Sent: Thursday, February 10, 2022 12:47 PM
To: Beam, Steve A <Steve.Beam@nationalgrid.com>
Cc: Snyder, PJ <PSnyder@geiconsultants.com>
Subject: [EXT] RE: EXT || FW: Schenectady Update, Site 447053

EXTERNAL EMAIL

Hi Steve,

How is this coming along, especially with respect to finalizing the remedial design?

TECHNICAL SPECIFICATIONS FOR REMEDIAL ACTION ISSUED FOR BID

SCHENECTADY (CLINTON STREET) OPERABLE UNIT 2 (OU2) MANUFACTURED GAS PLANT (MGP) SITE NYSDEC SITE #V00474

Prepared by
GEI CONSULTANTS, INC., P.C.
1301 Trumansburg Road, Suite N
Ithaca, NY 14850
(607) 216-8955

December 23, 2021

TECHNICAL SPECIFICATIONS

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall perform all activities and furnish all labor, materials, equipment, Subcontractor services, and incidentals to implement the Remedial Action (RA) in accordance with the Contract between National Grid and the Contractor. The Operable Unit 2 (OU2) Off-Site Impacts section of the Schenectady Non-Owned Former Manufactured Gas Plant (MGP) site (Site) RA consists of the excavation, removal, and off-Site disposal of MGP-related material. This may include, but is not limited to, installation of an excavation support system, demolition of existing site features and subsurface utilities, and the restoration of the Site.

B. National Grid has retained GEI Consultants, Inc., P.C. (Engineer) to serve as the engineer of record for the Project. The Engineer will serve as the single point of contact for the Contractor who is awarded the Work and will disseminate Contractor submittals for review to the appropriate parties and interface with other GEI technical staff, as needed.

C. All tasks, requirements, deliverables, etc. contained in the Contract Documents are the sole responsibility of the Contractor unless specifically assigned to Others. Project Work to be performed by the Contractor includes, but is not limited to, the following

1. Prepare and implement a Site-Specific Contractor Health and Safety Plan.
2. Prepare and implement a Site Operations Plan.
3. Install, operate, and maintain temporary facilities and controls, including:
    a. Stormwater and erosion controls.
    b. Worker health and safety measures.
    c. Equipment and personnel decontamination facilities.
    d. Field office trailers and parking.
    e. Sanitary facilities.
    f. Dust, odor, and vapor control.
    g. Excavated material (soil and debris) management/loading areas.
    h. Water collection/treatment/management.
    i. Temporary security fence.
    j. Traffic controls (as necessary).
4. Establish additional survey control points as necessary.
5. Obtain all necessary construction-related permits as required for completion of the Work.

6. Abide by the provisions of all permits and provide coordination and adequate notice as may be required of any construction activity that will require an inspection.

7. Perform the remediation

   a. Perform utility location tasks.

   b. Identify, temporarily relocate, or protect existing utilities and Site features to remain after the Project is complete.

   c. Permanently relocate existing stormwater infrastructure running through the Site.

   d. Install the excavation support system.

   e. Excavate and remove MGP-related impacted material, the overlying soil, and/or concrete and miscellaneous debris.

   f. Transport excavated MGP impacted material to a National Grid approved off-Site disposal facility as a direct-load operation, when practicable.

   g. Furnish, place and compact approved, clean soil backfill.

   h. Dismantle and remove the excavation support system.

   i. Reinstall all features and appurtenances that are damaged or relocated during the performance of the Work.

   j. Restore the Site as per the Contract Documents.

8. Clean up the Site and storage areas to preconstruction conditions, including grading and surface restoration, as directed by the Engineer. Demobilize and promptly remove all Contractor supplies, equipment, and tools from the Site. Restore, repair, or replace utilities, and other features removed, damaged, destroyed, or disrupted during construction.

9. Provide and perform any other equipment, Work, or submittals required to facilitate the Work shown in the Contract Documents.

1.02 PROJECT CONDITIONS

A. The Site is not owned by National Grid.

B. For available information concerning Site conditions, refer to the Contract Documents, the Remedial Investigation (RI) Report (GEI-2012), and the Pre-Design Investigation (PDI) Report (GEI-2016).

C. Information regarding Site conditions is intended to assist the Contractor in preparing his Bid. National Grid and the Engineer guarantee neither the accuracy of this information nor that this information is necessarily indicative of all conditions that may be encountered, therefore the Contractor agrees that it shall neither have nor assert against National Grid or Engineer any claim for damages by reasons of inaccuracy, inadequacy, incompleteness, or other deficiency of the information provided. The Contractor shall satisfy/verify for himself all existing conditions, including understanding the Site data

presented in the RI and PDI, affecting his Work by personal investigation. Failure by the Contractor to understand and verify all existing Site conditions shall not result in additional charges to National Grid. Also, neither the information provided the Engineer, National Grid, or their agents or employees, shall act to relieve Contractor of any responsibility hereunder from fulfilling all terms and requirements of the Contract Documents.

1.03 CONTRACTORS USE OF SITE

A. The Contractor's use of the Site shall be in accordance with the terms of the access agreements entered into between National Grid and the property owner. The access agreement is provided as Attachment A.

B. The Contractor shall limit its activities to the Project limits shown in the Contract Drawings. Only stage equipment and materials in designated areas, as approved by the Engineer.

1.04 CONTRACT DOCUMENTS

A. The Contract Documents include all Specifications, Contract Drawings, figures, and conditions included or referenced in the Request for Proposal package and any subsequent approved Change Orders.

B. It is not the intent of the Contract Documents to show every pipe, wire, conduit, utility connection, detail, and appurtenance necessary to complete the Work for this Project. However, such connections and details that may be necessary to complete the Work in accordance with Contract Documents, code requirements, and to the Owner's satisfaction will be included in the Work.

C. The organization and division of Work contained within the Contract does not make the Engineer or National Grid an arbitrator to establish contract limits between the Contractor and any Subcontractor.

D. Perform the Work in accordance with the concepts and intent of the Remedial Action Work Plan (RAWP). A copy of the RAWP is included as Appendix A to the Bid Documents.

1.05 CONTRACTOR REQUIREMENTS

A. Perform the scope of Work contained in the Contract Documents.

B. The Work will be performed on a known contaminated MGP Site. Comply with the requirements of the Contractor Health and Safety Plan. Take precautions as necessary to protect the public and work force personnel from potential hazards.

C. A list of National Grid-approved disposal facilities has been provided with the Contract Documents. The Contractor is responsible for providing any additional analytical testing required for acceptance of the material at the Contractor selected, National Grid-approved, disposal facilities.

D. Comply with the requirements of the Community Air Monitoring Plan (CAMP), taking precautions as necessary to protect the public and work force personnel from potential

hazards. A copy of the CAMP is included as an appendix of the RAWP which is included as Appendix A to the Bid Documents.

E. The Contractor is responsible for furnishing, installing, maintaining, and removing all soil erosion and stormwater control measures during the performance of the Work. Inspect and maintain temporary facilities and controls until the Work is complete. Installation, maintenance, and removal is to be in compliance with the Contract Documents. Maintain a representative on Site that has successfully completed the New York State Stormwater Pollution Prevention Plan (SWPPP) training program.

F. For any Work performed in close proximity to residential or commercial properties, utilities, or any other third-party property, take any and all necessary precautions to protect the property, utility lines, trees, walls, and other structures and/or related appurtenances from damage.

G. Repair any damage caused directly or indirectly outside the Project limits, as directed by the Engineer, at no additional cost to National Grid.

H. Comply with all applicable OSHA safety regulations during the performance of the Work.

1.06 CONTRACT DRAWINGS AND SPECIFICATIONS

A. Maintain at the Site, two copies of all Contract Drawings, Specifications, addenda, approved shop drawings, Change Orders, schedules, and instructions, in good order. Mark one set to record all changes made during construction and keep one set clean of all markings. Make both sets readily available for review by National Grid and/or the Engineer.

B. The Contract Drawings include notes. Refer to the Contract Drawings in conjunction with the Specifications.

1.07 WORK BY OTHERS

A. Perimeter air monitoring will be performed by the Engineer/Construction Manager (CM). Work zone air monitoring is the responsibility of the Contractor.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 11 00

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section contains general restrictions to be followed during the performance of the Work. Other sections of the specifications may contain additional requirements/restrictions for performance of their specific subject matter.

1.02 CONTRACT PERIOD

A. National Grid will coordinate with the selected Contractor to establish a mutually acceptable contract end date. Liquidated damages in the amount of $2,500/calendar day will be enforced for every day the Work is not at Substantial Completion past this mutually agreed upon contract end date.

B. Substantial Completion is defined as all remedial excavation work completed and backfilled.

1.03 WORK HOURS

A. Work activities can be conducted between the hours of 7:00 AM to 9:00 PM, on non-Holidays, Mondays through Fridays except in cases of emergency, as allowed by the City of Schenectady noise ordinances. If the Contractor desires to work outside of normal work hours, advanced approval from the Engineer/Construction Manager (CM), National Grid, and the City of Schenectady is required.

1.04 COMMUNICATION WITH THIRD PARTIES

A. Representatives of regulatory agencies from the New York State Department of Environmental Conservation (NYSDEC), City of Schenectady, and other local civic organizations may be on Site to observe and inspect the Work.

B. Direct communications with regulatory agency personnel to the Engineer/CM or their designee.

C. Do not communicate with the media/press, project stakeholders, elected officials, public, etc. regarding the Work. Refer all external questions and comments to the Engineer/CM.

1.05 LAY DOWN AND STAGING AREAS

A. On-Site laydown and staging areas is available for use at the Site.

B. Contractors may directly negotiate for additional off-Site space at no additional cost to National Grid, as needed.

1.06 VEHICLE ACCESS AND PARKING

A. The Contractor will access the Site from Van Guysling Ave.

B. Parking is available in the laydown and staging areas shown on the Contract Drawings.

1.07 SANITARY FACILITIES

A. Provide sanitary facilities for use by the Contractor personnel, Subcontractors, Engineer/CM, and visiting agency representatives during the performance of the Work.

1.08 NOISE CONTROL

A. Comply with the City of Schenectady codes regarding acceptable noise levels at all times.

B. Equip vehicles and motorized equipment with appropriate noise control devices to maintain noise levels that conform to current OSHA standards and State and local regulations. Take immediate steps to correct any deficiencies noticed, or as directed by the Engineer/CM.

C. Requirements for specialty construction equipment, such as sheetpile installation tools and equipment is provided in the associated technical specification section.

D. Properly maintain all mufflers and noise control devices, and replace when necessary. Operate all construction equipment in the manner that it was intended. Excessive amount of noise and vibration due to improper use of equipment is prohibited.

E. All equipment that is required to operate beyond standard work hours will, to the maximum extent possible, be electrically driven or otherwise configured for quiet operation (e.g., using propane as a fuel source).

1.09 EQUIPMENT LEFT ON SITE

A. Secure all equipment left on Site outside of standard work hours.

B. Ensure that all equipment, where feasible, is de-energized when left on Site and not in use to prevent electrical/fire/explosive hazards. The Contractor is responsible for the security, operation, and maintenance of any systems that require such services outside standard work hours. If systems are operational outside the standard work hours, provide oversight at all times when equipment is in operation, or provide an electronic monitoring system with a remote communication feature to alert the appropriate personnel of a system failure. Repair system failures in a timely manner such that the Project schedule is not affected.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

3.01 ENVIRONMENTAL PROTECTION

A. For the purposes of this specification, environmental protection is defined as the retention of the environment in its natural state to the greatest extent possible during construction, and to enhance its natural appearance at the conclusion of the Work. Comply with all applicable or relevant and appropriate Federal, State, local laws, permit conditions, and the Remedial Action Work Plan (RAWP) to provide for the abatement and control of any potential environmental impacts arising from the performance of the Work.

B. The Engineer/CM will notify the Contractor of any instances of non-compliance with Federal, State, local laws, permit conditions, or the RAWP and identify corrective actions to be taken. State or local agencies may also provide notification of non-compliance with State or local requirements. After receipt of the notice, immediately prepare to take corrective action, inform the Engineer/CM of the proposed corrective action, and take such actions once they are approved by the Engineer/CM. Failure or refusal to promptly comply may result in the Engineer/CM issuing an order suspending or halting all or parts of the Work until satisfactory corrective action has been taken. Claims for extensions of time or for excess costs or damages due to the stop Work order described above, will be denied.

C. Do not pollute any stream, river, waterway, roadway, or soil with fuel, oil, grease, lubricant, hydraulic fluid, bitumen, calcium chloride, acid, base, or other harmful materials. Comply with the appropriate Federal, State, and local regulations and guidelines for the handling and disposal of all materials.

D. Properly dispose of any debris resulting from the performance of the Work. Disposing of any debris, soil, water, effluent, by product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base, or other harmful material etc., in or adjacent to the Project area is not acceptable. Remove any unauthorized dumped materials and restore the area as directed by the Engineer/CM. If necessary, areas contaminated as a result of unauthorized activity, failure of environmental controls, or dumping by the Contractor will be remediated at no additional cost to the Owner.

E. Dispose of all contaminated materials (debris, soil, water, effluent, by-product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base, used erosion controls, or other harmful material, etc.) resulting from the Work in accordance with all applicable, or relevant and appropriate, Federal and State laws prior to completion of the Work.

END OF SECTION 01 14 00

SECTION 01 18 00

UTILITY PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. This specification contains the requirements for the location and protection of utilities affected by the performance of the Work.

1.02 UTILITY COORDINATION

A. The Contractor is solely responsible for any and all required notifications to utility companies prior to commencing the Work, and for response to any emergencies that may arise during the Work. Certain active and inactive utilities may currently be present at the Site. The exact location and type of utility is to be determined by the Contractor without reliance on information provided by National Grid or the Engineer/Construction Manager (CM).

1.03 PROTECTION OF EXISTING UTILITIES

A. Comply with the requirements of all applicable utility protection laws or regulations.

B. Contact and cooperate with utility companies to locate all utilities (including pipelines, cables, power poles, guy wires, and other structures) on the Site prior to beginning the Work.

C. Protect all utilities from damage during construction, unless otherwise indicated to be removed or abandoned. If damaged, repair the utilities as required by the utility's owner at the Contractor's expense.

D. If a utility is encountered that is not shown in the Contract Documents, or otherwise not made known to the Contractor prior to beginning the Work, promptly take the necessary steps to assure that the utility is not damaged and notify the Engineer/CM in writing of the presence of the utility. The Engineer/CM will review the conditions and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the utility.

E. Immediately notify the Engineer/CM of any incident involving a utility.

F. All utilities on Site must be located and positively identified prior to the start of intrusive activities.

1.04 SUBMITTALS

A. Submit a utility survey as required in the Contract Documents.

B. Submit a utility incident report to National Grid and Engineer/CM within 4 hours of any incident causing direct or indirect damage to a utility. At a minimum, document the following items in a utility incident report

1. Description of the incident.

2. Damage assessment.
3. Corrective actions taken.
4. Initial estimate on the need for permanent repairs.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

3.01 UTILITY IDENTIFICATION

A. Use "soft-dig" excavation techniques (e.g., air knife, vacuum excavation, or hand tools) to positively identify the location and type of all underground activities prior to the start of intrusive activities.

END OF SECTION 01 18 00

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. The items listed in Project Price Schedule constitute all of the pay items for completion of the Work.

1.02 SUBMITTALS

A. Submit a Project Price Schedule and Bid Form signed and sealed with a company seal by a company officer.

B. Submit monthly invoices in accordance with terms of the Agreement.

1.03 QUANTITY ESTIMATES

A. Verify estimated quantities for unit prices in the field.

B. National Grid and the Engineer/Construction Manager (CM) reserve the right to reject the Contractor's measurement of Work-in-place that involves the use of established unit prices and have Work measured by a second independent surveyor that is acceptable to National Grid and the Contractor.

C. For all unit price Work, the contract price will include an amount equal to the sum of the unit price for each pay item times the estimated quantity of each item as indicated in the Bid Form. The estimated quantities shown on the Project Price Schedule are not guaranteed and are solely for the purpose of comparison of bids and determining an initial contract price. Quantities and measurements supplied or placed in the Work in accordance with the Contract Documents, and verified by the Engineer/CM, will determine payment.

D. The Engineer/CM will verify the quantities and classifications of unit price Work invoiced by the Contractor. The Engineer/CM will review their preliminary determination with the Contractor before rendering a written decision on an application for payment.

E. If the actual Work requires more or fewer units than the estimated units indicated on the Project Price Schedule, provide the required units at the contracted unit price. Under no circumstances may the Contractor exceed estimated quantities without prior written approval from the Engineer/CM.

F. The Engineer/CM reserves the right to increase or decrease any pay item quantity, or to eliminate any pay item, as a result of the actual conditions encountered during the performance of the Work.

1.04 MEASUREMENT OF QUANTITIES

A. Measurement by Weight

1. Weigh Scales: Certified in accordance with applicable laws and regulations for the state in which the scales are located. Certification must be within a period of not more than one year prior to the date of use.
2. The term "ton" will mean the short ton consisting of 2,000 pounds.
3. For shipments to off-Site disposal facilities, trucks will be weighed at the receiving facility for the purpose of measuring the quantity of Work for payment.

B. Measurement by Volume

1. Volumes measured as in-place volumes will be determined by survey. Retain the services of an independent professional land surveyor, licensed in the State of New York, whose calculations of in-place volumes will be used for the purpose of measurement for payment. To compute in-place volumes, use the surface comparison function in the surveying software program, or other methods acceptable to the Engineer/CM.
2. Unless stated otherwise, all pay items referring to measurement by volume as the basis for payment will be taken to mean in-place volume.

C. Measurement by Area

1. Measured by square dimension using length and width, or radius, and verified by the Engineer/CM.

D. Linear Measurement

1. Measured by linear dimension, at the item centerline or mean chord, and verified by the Engineer/CM.

E. Measurement by Time

1. Measure by the actual time, rounded to the nearest time unit, and verified by the Engineer/CM.

1.05 ASSESSMENT OF NON-CONFORMING WORK

A. Replace Work, or portions of the Work, that do not conform to the requirements of the Contract Documents, as assessed by the Engineer/CM.

B. If, in the opinion of the Engineer/CM, it is not practical to remove and replace the non-conforming Work, the Engineer/CM will direct one of the following remedies

1. The non-conforming Work may remain, but the unit price will be adjusted to a new price at the discretion of the Engineer/CM.
2. Partially repair non-conforming Work to the instructions of the Engineer/CM, and the unit price will be adjusted to a new price at the discretion of the Engineer/CM.

C. The individual Specification sections, specific to the Work in question, may modify these options or may identify a specific formula or percentage price reduction.

D. The authority of the Engineer/CM to assess non-conforming Work, and identify payment adjustment, is final.

1.06 ELIMINATED ITEMS

A. If any items contained in the Contract Documents are found unnecessary for the proper completion of the Work, the Engineer/CM may, upon written order to the Contractor, eliminate such items from the Work, and such action will in no way invalidate the Agreement.

B. The Contractor will be paid for all Work performed and all documented costs incurred, including the mobilization of materials, prior to the elimination of such items.

1.07 MEASUREMENT AND PAYMENT OF BID ITEMS

A. The Project Price Schedule lists the pay items for the Work.

B. All pricing provided with the Contractor's Bid are to remain in force during the entire duration of the Project (i.e., no rate increases will be due to the Contractor at any point during the Work).

C. At the direction of the National Grid and/or the Engineer/CM, the Contractor may be asked to perform change order Work on a time and materials basis. The unit rate schedule included in the Contractor's proposal will be the basis for measurement and payment of equipment and labor for time and materials Work. Include overhead and profit on the Contractor unit rate schedule for all time and materials Work.

D. The following paragraphs specify measurement and payment of the pay items listed on the Project Price Schedule

Item 1 Mobilization

1. Work required to complete Mobilization includes, but is not limited to

   a. Mobilizing personnel, equipment, and materials to the Site, if such movement is not included in any other bid item.

   b. Obtaining all permits and insurance necessary to successfully complete the Project.

   c. Cleaning/decontaminating all construction-related equipment brought to the Site.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Mobilization will be made on a percent complete basis of the lump sum price for the Bid item "Mobilization" listed on the Project Price Schedule. Payment of the lump sum price for "Mobilization" will constitute full compensation for all labor, supervision, materials, equipment, incidentals, and all other costs necessary to complete Mobilization Work. Payment shall also include pre-construction costs, exclusive of bidding costs, which are necessary direct costs to the project and are of a general nature rather than directly attributable to other pay items under the Contract. The amount for Mobilization shall not exceed 10 percent of the Total Base Bid. The total sum of all payments for this item shall not exceed the original Contract amount bid for Mobilization, regardless of the fact that the Contractor may have, for any reason, shut down

their Work on the project, moved equipment away from the project and then back again, or for any additional quantities or items of Work added to the contract.

Item 2 Demobilization

1. Work required to complete Demobilization includes, but is not limited to
   a. Removing temporary facilities and controls. Dispose of non-reusable temporary facilities and controls related materials at a National Grid-approved Subtitle D landfill facility as non-hazardous waste debris.
   b. Removing temporary security fencing.
   c. Removing all project-related signage (e.g., project sign, site security signs, traffic control/warning signs, etc.).
   d. Restoring any remaining disturbed areas to pre-construction condition (or as directed by National Grid and/or the Engineer/CM).
   e. Removing any remaining temporary erosion and sediment control measures (i.e., silt fences, staked straw bales) once instructed to do so by the Engineer/CM.
   f. Cleaning/decontaminating all construction-related equipment at the Site (as necessary and/or as directed by the Engineer/CM).
   g. Demobilizing all temporary Site facilities (e.g., office equipment, portable toilets, hand wash stations, etc.). Demobilizing all remaining personnel, equipment, and materials.
   h. Closing out all permits and insurance obtained during the Work.
2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.
3. Payment for Demobilization will be made on a percent complete basis of the lump sum price for the Bid item "Demobilization" listed on the Project Price Schedule. Payment of the lump sum price for "Demobilization" will constitute full compensation for all labor, supervision, materials, equipment, incidentals, and all other costs necessary to complete Demobilization Work.

Item 3 Project Support

1. Work required to complete Project Support includes, but is not limited to:
   a. Provide all required Project management and oversight by Contractor personnel.
   b. Developing all schedules, submittals, shop drawings, specifications, calculations, data, certifications, etc., related to the materials, products, and procedures necessary to carry out the Work, including pre-mobilization submittals (e.g., Contractor Health and Safety Plan, Site Operations Plan, etc.). Revising/re-submitting such items as required until accepted by National Grid and the Engineer/CM.
   c. Maintaining and updating construction-phase field records in anticipation of closeout documentation.

d. Attending a pre-construction meeting, weekly on-Site construction progress meetings, and a project close-out meeting/walk through.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Project Support will be made on a percent complete basis of the lump sum price for the Bid item "Project Support" listed on the Project Price Schedule. Payment of the lump sum price for "Project Support" will constitute full compensation for all labor, supervision, materials, equipment, incidentals, and all other costs necessary to complete the Project Support Work.

Item 4 Pre-Characterization Program

1. Work required to complete Pre-Characterization Program includes, but is not limited to:

a. Consulting with the selected and approved disposal facilities to develop a list of analyses, sample quantities, and sample locations to meet the acceptance criteria and sample frequency based on the estimated quantities of excavated materials scheduled for off-Site disposal.

b. Developing a Pre-Characterization Program Execution Plan and submitting to the Engineer/CM.

c. Planning, coordinating, and executing a subsurface exploration and testing program to adequately characterize soils for off-Site disposal and to maximize the amount of soil that can be live loaded.

d. Locating the exploration locations and developing a figure illustrating the as-built exploration locations and the associated grid system or other methods to correlate sample results with in-situ conditions, the proposed excavation sequence and associated volumes/tonnage.

e. Calculating volumes/tonnage for each disposal facility.

f. Evaluating if stabilization measures or other in-situ or ex-situ treatment/handling will be required to avoid disposal facility surcharges and reporting the findings to the Engineer/CM in writing a minimum of 10 business days prior to commencing intrusive activities.

g. Preparing the necessary data tables, reports, and other correspondence to obtain facility approval prior to commencing intrusive activities.

h. Submitting the analytical data to the Engineer/CM. This data will be reviewed "For Information Only".

i. Collecting and analyzing any confirmatory, documentation, or other samples that may be required to compare the data collected during the Pre-Characterization Program with excavated material being sent for off-Site disposal.

j. Performing all other activities to achieve and maintain disposal facility acceptance for all excavated material generated during the execution of

the work, including decontamination spoils and wastes generated after intrusive activities and/or during demobilization activities.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Pre-Characterization program will be made on a percent complete basis of the Project for the lump sum price for the Bid item "Pre-Characterization Program" listed on the Project Price Schedule. Payment of the lump sum price for "Pre-Characterization Program" will constitute full compensation for all labor, supervision, materials, reporting, equipment, incidentals and all other costs necessary to complete Pre-Characterization Program Work, as specified in the Contract Documents.

Item 5 Survey Control and Documentation

1. Work required to complete Survey Control and Documentation includes, but is not limited to:

   a. Providing and using a Professional Land Surveyor licensed in the State of New York for all survey activities necessary for the proper construction and documentation of the Work.

   b. Installing and monitoring all survey points installed as part of the instrumentation program for the existing structures and the excavation support system and regularly reporting those values in a format that is acceptable to the Engineer/CM.

   c. Performing topographic surveys of the Site before excavation begins to record pre-Work conditions, and at completion of excavation to record the extents of excavation and after filling to record thicknesses of fill types and the restored topography.

   d. Performing all surveying work needed to control and document the Work.

   e. Performing field surveys as necessary to set and record the manhole bottom, invert, and rim elevations, as well as elevation and invert elevations of inlet, outlet, and outfall piping along the rerouted storm drain alignment.

   f. Providing a full, as-built survey acceptable to National Grid and the Engineer/CM prior to completion of the Work.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Survey will be made on a percent complete basis of the Project for the lump sum price for the Bid item "Survey Control and Documentation" listed on the Project Price Schedule. Payment of the lump sum price for "Survey Control and Documentation" will constitute full compensation for all labor, supervision, materials, reporting, equipment, incidentals and all other costs necessary to complete Survey Control and Documentation Work, as specified in the Contract Documents.

Item 6 Site Preparation

1. Work required to complete Site Preparation includes, but is not limited to:
    a. Furnishing and erecting MGP Remediation Program signs consistent with NYSDEC requirements (see Contract Drawings).
    b. Performing any clearing or grubbing of the Site and laydown area required to complete the Work, including the clearing of areas where air monitoring equipment is to be setup.
    c. Furnishing and erecting a temporary security fence and privacy screen to create a secure site perimeter.
    d. Furnishing and installing temporary concrete barriers with attached security fence and privacy screen along Van Guysling Avenue.
    e. Protecting and decommissioning existing monitoring wells.
    f. Removing the existing stone cover (at the locations shown on the Contract Drawings) and stockpiling for reuse.
    g. Removing, loading, and off-Site disposal of any existing debris on the Project Site.
    h. Investigating existing stormwater infrastructure and abandoning or protecting existing infrastructure as described in the Contract Documents.
    i. Demolishing pavement sections that overlay the excavation area.
    j. Demolishing the concrete slab that extends into the excavation area, as noted on the Contract Drawings.
2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.
3. Payment for Site Preparation will be made on a percent complete basis of the lump sum price for the Bid item "Site Preparation" listed on the Project Price Schedule. Payment of the lump sum price for "Site Preparation" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Site Preparation Work, as specified in the Contract Documents.

Item 7a Storm Drainage Bypass Infrastructure

1. Work required to complete the Storm Drainage Bypass Infrastructure includes, but is not limited to
    a. Permitting, traffic control and coordination with the City of Schenectady and other stakeholders.
    b. Saw cutting pavement.
    c. Providing, designing, installing, and removing all required temporary shoring components for safe excavation and installation.

d. Excavating for structures and piping along the proposed alignment for temporary bypass components within and along Van Guysling Avenue, and across the Site and stockpiling soils for off-Site disposal.

e. Installing the temporary stormwater bypass piping, structures, and associated connections.

f. Placing and compacting bedding and backfill materials, and installing geotextile as shown on the Contract Drawings.

g. Restoring the existing ground surface, including paving the portion of Van Guysling Ave.

h. Plugging the existing storm drainage piping to direct flow to the temporary bypass.

i. Removing, backfilling, abandoning, and restoring the Storm Drainage Bypass System at the completion of the Work.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Storm Drainage Bypass Infrastructure will be made on a percent complete basis of the lump sum price for the Bid item "Storm Drainage Bypass Infrastructure" listed on the Project Price Schedule. Payment of the lump sum price for "Storm Drainage Bypass Infrastructure" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Storm Drainage System Bypass Infrastructure, as specified in the Contract Documents.

Item 7b Storm Drainage Bypass Pumping

4. Work required to complete Storm Drainage Bypass Pumping includes, but is not limited to

a. Furnishing, designing, installing, operating, maintaining, and removing all required temporary bypass pumps, sound attenuation enclosures, power, fuel, piping, switches/sensors, connections, and all other appurtenant structures and components for the execution of the work.

b. Maintaining all necessary additional system components to provide full system redundancy on-site for the duration of the Work.

c. Coordinating the sizes of the temporary bypass infrastructure with the selected pump intake, float switches, and other bypass pump components as necessary.

d. Continuous operation (24/7) of the bypass system for the entire duration when the existing or proposed storm drain alignment is not in service.

e. Operating, maintaining and monitoring an automated warning and notification system to alert Contractor staff if a system error is discovered. System to be operated and monitored 24 hours per day for the entire duration that the system is in use.

f. Providing appropriately trained staff to respond to all notifications within 30 minutes of receipt.

5. Payment will be based on the Contract Unit Price per "Month" provided in the Project Price Schedule. A month is defined as 30 calendar days or more, and fractional months will be computed based on the number of actual days in operation.

6. Payment for this Item will be made in accordance with the unit price for the Bid item "Storm Drainage Bypass Pumping" listed on the Project Price Schedule. Payment of the unit price for "Storm Drainage Bypass Pumping" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Storm Drainage Bypass Pumping Work, as specified in the Contract Documents.

Item 7c Storm Drain Realignment

7. Work required to complete the Storm Drainage System includes, but is not limited to

   a. Saw cutting pavement

   b. Providing, designing, installing, and removing all required temporary shoring components for safe excavation and installation.

   c. Excavating for structures and piping along the proposed alignment within and along Van Guysling Avenue, and across the Site and stockpiling soils for off-Site disposal.

   d. Installing 250 LF of storm drainage piping, two manhole structures, all associated connections and all other components required to complete the work in accordance with the Contract Documents.

   e. Installing up to 3 trench dams along the alignment.

   f. Placing and compacting bedding and backfill materials, and installing geotextile as shown on the Contract Drawings.

   g. Abandoning the temporary bypass infrastructure.

   h. Restoring all areas disturbed by the temporary bypass infrastructure, abandoning the temporary bypass infrastructure, or from storm drainage system realignment Work, including, but not limited to sidewalk, stone and asphalt pavement surfaces.

8. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

9. Payment for Storm Drain Realignment will be made on a percent complete basis of the lump sum price for the Bid item "Storm Drain Realignment" listed on the Project Price Schedule. Payment of the lump sum price for "Storm Drain Realignment" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Storm Drain Realignment System Work, as specified in the Contract Documents.

Item 8 Temporary Facilities and Controls

1. Work required to complete Temporary Facilities and Controls includes, but is not limited to

   a. Providing temporary facilities and services for the duration of the project, including, but not limited to, field office trailers, office equipment, utilities (i.e., electrical, heating/cooling, telephone, and internet), potable water service, refrigerators/microwaves, portable toilets and hand wash stations, refuse disposal services, and regular sanitary disposal service.

   b. Providing a minimum of two odor/vapor suppressant foam generator and associated labor. Foam generators should be mobilized during the initial equipment mobilization and remain on Site for the full duration of all intrusive activities. One generator will be the primary and the other will be a backup/standby. Foam expendables will be paid under a separate item.

   c. Constructing of the excavation stockpile pad(s).

   d. Constructing, operating, maintaining, and ultimately disposing of an equipment cleaning/decontamination pad.

   e. Implementing the health and safety requirements specified in the Contractor Health and Safety Plan detailed in the Contract Documents.

   f. Installing erosion controls as shown on the Contract Drawings; perform weekly inspections of all features, as well as inspections immediately after each precipitation event; repair or replace controls as needed; remove and dispose used erosion controls in accordance with all applicable or relevant and appropriate Federal and State laws, regulations and/or permit requirements prior to demobilization.

   g. Installing and maintaining all temporary facilities and controls as specified in the Contract Documents, unless specifically identified as being provided by Others.

   h. Maintaining and repairing all temporary facilities and controls, including those provided by Others, when Work is taking place at the Site.

   i. All other recurring activities not included in another pay item, or specifically identified as being the responsibility of Others, required to complete the Work.

   j. Providing snow removal for the duration of the project.

2. Payment will be based on the Contract Unit Price per “Lump Sum” provided in the Project Price Schedule.

3. Payment for Temporary Facilities and Controls will be made on a percent complete basis of the Project for the lump sum price for the Bid item “Temporary Facilities and Controls” listed on the Project Price Schedule. Payment of the lump sum price for “Temporary Facilities and Controls” will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all

other costs necessary to complete the Temporary Facilities and Controls Work, as specified in the Contract Documents.

Item 9 Water Treatment System - Mobilization

1. Work required to complete the Water Treatment System - Mobilization pay item includes, but is not limited to

   a. Furnishing a wastewater treatment system design that meets the requirements of the City of Schenectady Publicly Owned Treatment Works (POTW) that has been certified by a professional engineer who is licensed to practice in the State of New York.

   b. Furnishing, mobilizing, and assembling/testing all dewatering and wastewater treatment-related equipment to the Site including all initial media with the exception of the ion-exchange resin.

   c. Furnish and install ion-exchange resin vessel, piping and bypass components. Initial water treatment system operation will bypass this treatment component. Ion-exchange treatment will only be used if required by site-specific data and/or facility acceptance criteria and approved in writing by the Owner.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Dewatering and Water Treatment System– Mobilization will be made in accordance with the lump sum price for the Bid item "Water Treatment System - Mobilization" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Mobilization" will constitute full compensation for all equipment, incidentals and all other costs necessary to provide the Water Treatment System – Mobilization Work, as specified in the Contract Documents.

Item 10 Water Treatment System - Operation

1. Work required to complete the Water Treatment System - Operation pay item includes, but is not limited to

   a. Collecting and treating all construction-related water to the treatment standards identified in the POTW local limits and acceptance criteria for the Site.

   b. Discharging the treated water in accordance with the permit requirements.

   c. Providing all backup and spare components and parts to maintain the system operational at all times.

   d. Performing all necessary maintenance to allow full operation.

   e. Collecting samples and performing all analyses required to comply with discharge permit for the Site.

2. Payment will be based on the Contract Unit Price per "Month" of operation provided in the Project Price Schedule and as approved by the Engineer/CM. A

month is defined as 30 calendar days or more, and fractional months will be computed based on the number of actual days in operation.

3. Payment for this Item will be made in accordance with the unit price for the Bid item "Water Treatment System - Operation" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Operation" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Water Treatment System - Operation Work, as specified in the Contract Documents.

Item 10a Water Treatment System - Organoclay Changeout

1. Work required to complete the Water Treatment System - Organoclay Changeout pay item includes, but is not limited to

   a. Furnishing, changing and disposing of organoclay media required for Water Treatment System Operation and compliance with the associated discharge/acceptance criteria.

   b. Complete organoclay media changeouts and all necessary maintenance to allow full operation.

2. Payment will be based on the Contract Unit Price per each provided in the Project Price Schedule and as approved by the Engineer/CM.

3. Payment for this Item will be made in accordance with the unit price for the Bid item "Water Treatment System - Organoclay Changeout" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Organoclay Changeout" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Water Treatment System - Organoclay Changeout Work, as specified in the Contract Documents.

Item 10b Water Treatment System - Carbon Changeout

1. Work required to complete the Water Treatment System - Carbon Changeout pay item includes, but is not limited to

   a. Furnishing, changing and disposing of carbon media required for Water Treatment System Operation and compliance with the associated discharge/acceptance criteria.

   b. Complete carbon media changeouts and all necessary maintenance to allow full operation.

2. Payment will be based on the Contract Unit Price per each provided in the Project Price Schedule and as approved by the Engineer/CM.

3. Payment for this Item will be made in accordance with the unit price for the Bid item "Water Treatment System - Carbon Changeout" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Carbon Changeout" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Water Treatment System - Carbon Changeout Work, as specified in the Contract Documents.

Item 11 Water Treatment System - Demobilization

1. Work required to complete the Water Treatment System - Demobilization pay item includes, but is not limited to
   a. Disassembly, decontamination, and removal of all dewatering and water treatment-related equipment from the Site.
   b. Off-Site transport and disposal of spent treatment system components/media.
2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.
3. Payment for Dewatering and Water Treatment System - Demobilization will be made in accordance with the lump sum price for the Bid item "Water Treatment System - Demobilization" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Demobilization" will constitute full compensation for all equipment, incidentals and all other costs necessary provide the Water Treatment System – Demobilization Work, as specified in the Contract Documents.

Item 12 Excavation Support System

1. Work required to complete the Excavation Support System includes, but is not limited to
   a. Moving personnel, equipment, and materials to the Site, required for the installation and removal of the excavation support systems.
   b. Procuring and delivering all required components to the Site.
   c. Installing the excavation support systems.
   d. Installing and maintaining/repairing all optical survey targets.
   e. Furnishing, installing, and removing temporary support or shoring as required.
   f. Extracting/removing all elements of the excavation support system.
   g. Removing all elements of the excavation support system from the Site.
2. Payment for the Excavation Support System will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.
3. Payment for the Excavation Support System will be made in accordance with the lump sum price for the Bid item "Excavation Support System" listed on the Project Price Schedule. Payment of the lump sum price for "Excavation Support System" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Installation of the Excavation Support System Work, as specified in the Contract Documents.

Item 13 Excavation Dewatering and Water Control

1. Work required to complete Excavation Dewatering and Water Control includes, but is not limited to

a. Furnishing a design of a dewatering and water control system that meets the requirements of the applicable permits for the Site, and that has been developed and approved by a professional engineer who is licensed to practice in the State of New York.

b. Installing all necessary components of the systems to monitor groundwater levels, unwater the soils contained within the excavation support system, and to dewater the excavation areas during the Work to maintain groundwater levels as required in the Contract Documents.

c. Adding, modifying, moving, augmenting, and maintaining the system components for the duration of the excavation and backfill Work, until backfill has reached a minimum of 2 feet above the static groundwater level.

d. Operating and maintaining the dewatering system and conveying all effluent to the on-Site wastewater treatment system.

e. Removing all dewatering and water control components system from the Site.

2. Payment will be based on the Contract Unit Price per "Lump Sum" provided in the Project Price Schedule.

3. Payment for Excavation Dewatering and Water Control will be made in accordance with the lump sum price for the Bid item "Excavation Dewatering and Water Control" listed on the Project Price Schedule. Payment of the lump sum price for "Excavation Dewatering and Water Control" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Excavation Dewatering and Water Control Work, as specified in the Contract Documents.

Item 14a Subgrade Excavation

1. Work required to complete Subgrade Excavation includes, but is not limited to

a. Stripping existing stone surface and other soil to establish the final subgrade elevation using methods that will prevent cross contamination of materials that have been designated for off-Site disposal, on-Site reuse, or potential on-Site reuse.

b. Direct loading of the material for off-Site disposal, or on-Site stockpiling for soil scheduled for reuse or requiring gravity dewatering.

2. Payment will be based on the Contract Unit Price per "Cubic Yard" provided in the Project Price Schedule. Payment quantity will be calculated based on survey measurements of the plan area of excavation and the bottom elevation of the excavation approved by National Grid. All area measurements and volume calculations to be certified by a Professional Land Surveyor registered in the State of New York.

3. Payment for Subgrade Excavation Work will be made in accordance with the unit price for the Bid item "Subgrade Excavation" listed on the Project Price Schedule. Payment of the unit price for "Subgrade Excavation" will constitute

full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Subgrade Excavation Work, as specified in the Contract Documents.

Item 14b Remedial Excavation

1. Work required to complete Remedial Excavation includes, but is not limited to
   a. Excavating soils and other materials using methods from within the remedial boundary and excavation support system that will prevent cross contamination of materials that have been designated for off-Site disposal, on-Site reuse, or potential on-Site reuse.
   b. Direct loading of the material for off-Site disposal, or on-Site stockpiling for soil scheduled for reuse or requiring gravity dewatering.
2. Payment will be based on the Contract Unit Price per "Cubic Yard" provided in the Project Price Schedule. Payment quantity will be calculated based on survey measurements of the plan area of excavation and the bottom elevation of the excavation approved by National Grid. All area measurements and volume calculations to be certified by a Professional Land Surveyor registered in the State of New York.
3. Payment for Remedial Excavation Work will be made in accordance with the unit price for the Bid item "Remedial Excavation" listed on the Project Price Schedule. Payment of the unit price for "Remedial Excavation" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Remedial Excavation Work, as specified in the Contract Documents.

Item 15 Soil Amendment

1. Work required for Soil Amendment includes, but is not limited to
   a. Furnishing Cement Kiln Dust (CKD), Lime Kiln Dust (LKD), lime, Portland cement, or other NYSDEC- and Engineer/CM-approved amendment for the *ex-situ* reduction of the moisture content of excavated soil to a level that meets the requirements of the disposal facility.
   b. All on-Site material storage and conveyance required to apply the amendment agent.
   c. All material handling required to blend the material as specified in the Contract Documents.
2. This pay item may only be used after written approval by National Grid and the Engineer/CM, and after the Contractor has provided acceptable justification that gravity dewatering techniques have proven to be insufficient to achieve the moisture content required for disposal in a timely manner.
3. Payment will be based on the Contract Unit Price per "Ton" of applied as approved and directed by the Engineer/CM.
4. Payment for Soil Amendment will be made in accordance with the unit price for the Bid item "Soil Amendment" listed on the Project Price Schedule. Payment of

the unit price for "Soil Amendment" will constitute full compensation for the amendment of soils for the purpose of moisture reduction, at the direction of the Engineer/CM, including all labor, equipment, and incidentals required to complete Soil Amendment Work, as specified in the Contract Documents.

Item 16 Odor Control Foam - Expendables

1. Work required to complete Odor Control Foam System - Expendables includes, but is not limited to
   a. Furnishing vapor-suppressant foam (AC-667SE Foam by Rusmar, Inc. or Engineer/CM-approved equivalent) for the control of dust, vapor, and odor emissions during intrusive and/or potential dust generating activities.
   b. Applying odor control foam as directed by the Engineer/CM.
2. Payment will be based on the Contract Unit Price per "Drum" of foam concentrate expended during the work. A drum is defined as a standard 55-gallon drum. Unused drums at the completion of the work will not be measured for payment.
3. Payment for Odor Control Foam - Expendables Work will be made in accordance with the unit price for the Bid item "Odor Control Foam - Expendables" listed on the Project Price Schedule. Payment of the unit price for "Odor Control Foam - Expendables" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to provide Odor Control Foam - Expendables Work, as specified in the Contract Documents and/or as directed by the Owner.

Item 17 Transportation and Landfill Disposal: Soil

1. Work required to complete the Transportation and Landfill Disposal: Soil includes, but is not limited to
   a. Coordination, loading, transportation, and disposal of excavated soil from the Project Site to the National Grid-approved disposal facility(ies) identified in the Contractor's approved Site Operations Plan.
   b. Lining, tarping, and cleaning/decontaminating transport vehicles prior to leaving the Site (as necessary and/or as directed by the Owner).
   c. Phasing and executing the Project sequencing so as not to exceed the capacity of the disposal facility to accept soil generated during the performance of the Work.
   d. Providing all laboratory analyses required to meet all applicable acceptance criteria for the National Grid-approved and Contractor-selected disposal facility(ies) for material that was not characterized using the pre-characterization program.
2. Payment will be based on the Contract Unit Price per ton (2,000 lbs.) basis and will be measured using weight tickets from validated scales.

3. Payment for Transportation and Landfill Disposal: Soil Work will be made in accordance with the unit price for the Bid item "Transportation and Landfill Disposal: Soil" listed on the Project Price Schedule. Payment of the unit price for "Transportation and Landfill Disposal: Soil" will constitute full compensation for all labor, supervision, materials, equipment, incidentals, disposal fees, and all other costs necessary to complete Transportation and Landfill Disposal: Soil, as specified in the Contract Documents.

Item 18 Transportation and Disposal: Debris

1. Work required to complete the Transportation and Disposal: Debris pay item includes, but is not limited to

   a. Coordinating, loading, transporting, and disposing of any and all debris generated from the Project Site that is designated for off-Site disposal by the Engineer/CM to the National Grid-approved disposal facility(ies) identified in the Contractor's approved Site Operations Plan.

   b. Lining, tarping, and cleaning/decontaminating transport vehicles prior to leaving the Site (as necessary and/or as directed by the Engineer/CM).

   c. Planning and executing the Project sequencing so as not to exceed the capacity of the disposal facility to accept debris generated during the performance of the Work.

   d. Providing all laboratory analyses required to meet all applicable acceptance criteria for the National Grid-approved and Contractor-selected disposal facility(ies).

2. Payment will be based on the Contract Unit Price per ton (2,000 lbs.) basis and will be measured using weight tickets from validated scales.

3. Payment for Transportation and Disposal: Debris Work will be made in accordance with the unit price for the Bid item "Transportation and Disposal: Debris" listed on the Project Price Schedule. Payment of the unit price for "Transportation and Disposal: Debris" will constitute full compensation for all labor, supervision, materials, equipment, incidentals, disposal fees, and all other costs necessary to complete Transportation and Disposal: Debris Work, as specified in the Contract Documents.

Item 19 Transportation and Thermal Disposal: Soil

1. Work required to complete Transportation and Thermal Disposal: Soil includes but is not limited to

   a. Coordinating, loading, transporting, and disposing of excavated soil from the Project Site to the National Grid-approved off-Site Low Temperature Thermal Desorption (LTTD) facility permitted to accept soil that exhibits a toxicity characteristic for benzene due to the presence of coal tar NAPL in the soil.

   b. Lining, tarping, and cleaning/decontaminating transport vehicles prior to leaving the Site (as necessary and/or as directed by the Engineer/CM).

c. Planning and executing the Project sequencing so as not to exceed the capacity of the LTTD facility to accept soil generated during the performance of the Work.

d. Providing all laboratory analyses required to meet all applicable acceptance criteria for the National Grid-approved and Contractor-selected disposal facility(ies) for material that was not characterized using the pre-characterization program.

2. Payment will be based on the Contract Unit Price per ton (2,000 lbs.) basis and will be measured using weight tickets from validated scales.

3. Payment for Transportation and Thermal Disposal: Soil will be made in accordance with the unit price for the Bid item "Transportation and Thermal Disposal: Soil" listed on the Project Price Schedule. Payment of the unit price for "Transportation and Thermal Disposal: Soil" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Transportation and Thermal Disposal: Soil Work, as specified in the Contract Documents.

Item 20 Furnish and Place Imported Granular Fill

1. Work required to complete Furnish and Place Imported Granular Fill includes, but is not limited to

   a. Analytical testing, procuring, transporting, placing, compacting, and compaction testing of approved Imported Granular Fill.

      1) Emerging Contaminant analytical samples will be collected and analyzed by the Design Engineer/CM.

   b. Installing a demarcation barrier at the bottom of the Imported Granular Fill.

2. Payment will be based on the Contract Unit Price per cubic yard basis as determined by survey measurements of the plan area of excavation and the in-place thickness of fill layer as observed by the Engineer/CM and certified by a Professional Land Surveyor registered in the State of New York.

3. Payment for Furnish and Place Imported Granular Fill Work will be made in accordance with the unit price for the Bid item "Furnish and Place Imported Granular Fill" listed on the Project Price Schedule. Payment of the unit price for "Furnish and Place Imported Granular Fill" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Furnish and Place Imported Granular Fill Work, as specified in the Contract Documents.

Item 21 Place On-Site Reuse Material

1. Work required to complete Place On-Site Reuse Material includes, but is not limited to

   a. Furnishing and installing the demarcation barrier at the excavation subgrade.

b. Installing geotextile separation layers above and below stone cover backfill and as shown on the drawings.

c. Placing and compacting approved on-Site reuse backfill material.

2. Payment will be based on the Contract Unit Price per cubic yard as determined by survey measurements of the plan area of excavation as observed by the Engineer/CM and certified by a Professional Land Surveyor registered in the State of New York.

3. Payment for Place On-Site Reuse Material Work will be made in accordance with the unit price for the Bid item "Place On-Site Reuse Material" listed on the Project Price Schedule. Payment of the unit price for "Place On-Site Reuse Material" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Place On-Site Reuse Material Work, as specified in the Contract Documents.

Item 22a Furnish and Place Gravel Base

1. Work required to complete Furnish and Place Gravel Base includes, but is not limited to

a. Procuring, transporting, placing, and compacting approved Gravel Base subgrade as shown in the Contract Drawings.

2. Payment will be based on the Contract Unit Price per ton (2,000 lbs.) calculated using weight tickets from a certified scale.

3. Payment for Furnish and Place Gravel Base Work will be made in accordance with the unit price for the Bid item "Furnish and Place Gravel Base" listed on the Project Price Schedule. Payment of the unit price for "Furnish and Place Gravel Base" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Furnish and Place Gravel Base Work, as specified in the Contract Documents.

Item 22b Furnish and Place Crusher Run

1. Work required to complete Furnish and Place Crusher Run includes, but is not limited to

a. Procuring, transporting, placing, and compacting approved Crusher Run surface to achieve the final grades as shown in the Contract Drawings.

2. Payment will be based on the Contract Unit Price per ton (2,000 lbs.) calculated using weight tickets from a certified scale.

3. Payment for Furnish and Place Crusher Run Work will be made in accordance with the unit price for the Bid item "Furnish and Place Crusher Run" listed on the Project Price Schedule. Payment of the unit price for "Furnish and Place Crusher Run" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Furnish and Place Crusher Run Work, as specified in the Contract Documents.

Item 23 Asphalt Replacement

1. Work required to complete Asphalt Replacement includes, but is not limited to

a. Furnishing and installing all the materials required to complete a full depth pavement restoration of the removed pavement areas sections as shown on the Contract Drawings.

b. Restoring and/or replacing any asphalt pavement related Site features or appurtenances (e.g., parking bumpers, pavement striping) removed or demolished during the performance of the excavation.

2. Payment will be based on the Contract Unit Price per square yard basis as determined by survey measurements of the plan area as observed by the Engineer/CM and certified by a Professional Land Surveyor registered in the State of New York.

3. Payment for Asphalt Replacement will be made in accordance with the unit price for the Bid item "Asphalt Replacement" listed on the Project Price Schedule. Payment of the unit price for "Asphalt Replacement" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Asphalt Replacement Work as specified in the Contract Documents.

Item 24 Abandoning the Historic Manhole Structure

1. Work required to complete the Abandoning the Historic Manhole Structure includes, but is not limited to

a. Filling the historic manhole with Controlled Low Strength Material (CLSM) to within 1 foot of the final finished restoration grade of the Site. Final one foot of fill to be the final surface restoration material as shown in the Contract Documents.

b. Demolishing the historic structure to a depth of 1 foot below the final Site restoration grade.

c. For the purposes of constructing a Bid, assume that 15 cubic yards of CLSM will be required to abandon the historic manhole.

2. The price for this item will be the lump sum cost provided as part of the Contractors Bid.

3. Payment for Abandoning the Historic Manhole Structure will be made in accordance with the lump sum price for the Bid item "Abandoning the Historic Manhole Structure" listed on the Project Price Schedule. Payment of the lump sum price for "Abandoning the Historic Manhole Structure" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Abandoning the Historic Manhole Structure, as specified in the Contract Documents.

Alt 1 On-Site Wastewater Treatment System - Freeze Protection

1. Work required to complete On-Site Wastewater Treatment System - Freeze Protection includes but is not limited to

a. Furnishing and augmenting the existing on-Site wastewater treatment system with the necessary components to safeguard the system against damage from freezing temperatures.

b. Installing the freeze protection system in such a way that it does not diminish the capacity of the treatment system or render it noncompliant with the discharge permit.

2. The price for this item will be the lump sum cost provided as part of the Contractors Bid.

3. Payment for On-Site Wastewater Treatment System - Freeze Protection Work will be made in accordance with the lump sum price for the Bid item "On-Site Wastewater Treatment System - Freeze Protection" listed on the Project Price Schedule. Payment of the lump sum price for "On-Site Wastewater Treatment System - Freeze Protection" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete On-Site Wastewater Treatment System - Freeze Protection Work, as specified in the Contract Documents.

Alt 2 Storm Drainage Bypass Pumping - Freeze Protection

1. Work required to complete Storm Drainage Bypass Pumping - Freeze Protection includes but is not limited to

   a. Furnishing and augmenting the existing Storm Drainage Bypass Pumping system with the necessary components to safeguard the system against damage from freezing temperatures.

   b. Installing the freeze protection system in such a way that it does not diminish the capacity of the bypass system or render it inoperable.

2. The price for this item will be the lump sum cost provided as part of the Contractors Bid.

3. Payment for Storm Drainage Bypass Pumping - Freeze Protection Work will be made in accordance with the lump sum price for the Bid item "Storm Drainage Bypass Pumping - Freeze Protection" listed on the Project Price Schedule. Payment of the lump sum price for "Storm Drainage Bypass Pumping - Freeze Protection" will constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Storm Drainage Bypass Pumping - Freeze Protection Work, as specified in the Contract Documents.

Alt 3 Water Treatment System - Ion Exchange Resin

1. Work required to complete the Water Treatment System - Ion Exchange Resin pay item includes, but is not limited to

   a. Furnishing and installing ion-exchange media required for Water Treatment System Operation and compliance with the associated discharge/acceptance criteria.

      1) Ion-exchange vessel(s) and all necessary piping/bypass components are included under Water Treatment System - Mobilization

2. Payment will be based on the Contract Unit Price per each provided in the Project Price Schedule and as approved by the Engineer/CM.

3. Payment for this Item will be made in accordance with the unit price for the Bid item "Water Treatment System - Ion Exchange Resin" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Ion Exchange Resin" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Water Treatment System - Ion Exchange Resin Work, as specified in the Contract Documents.

Alt 4 Water Treatment System - Ion Exchange Resin Changeout

1. Work required to complete the Water Treatment System - Ion Exchange Resin Changeout pay item includes, but is not limited to
   a. Furnishing, changing and disposing of ion-exchange media required for Water Treatment System Operation and compliance with the associated discharge/acceptance criteria.
   b. Complete ion-exchange media changeouts and all necessary maintenance to allow full operation.
2. Payment will be based on the Contract Unit Price per each provided in the Project Price Schedule and as approved by the Engineer/CM.
3. Payment for this Item will be made in accordance with the unit price for the Bid item "Water Treatment System - Ion Exchange Resin Changeout" listed on the Project Price Schedule. Payment of the unit price for "Water Treatment System - Ion Exchange Resin Changeout" will constitute full compensation for all labor, supervision, fees, materials, incidentals and all other costs necessary to complete the Water Treatment System - Ion Exchange Resin Changeout Work, as specified in the Contract Documents.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 20 00

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section describes Project administrative requirements, the minimum level of coordination and meetings required to execute the Work and required pre-mobilization submittals.

1.02 ON-SITE CONSTRUCTION PERSONNEL

A. The Engineer/Construction Manager (CM) will be responsible for construction quality assurance and ensuring that the Contractor completes the Work in accordance with the Contract Documents. The Engineer/CM will advise the Contractor of non-compliance with the Contract Documents and identify required corrective action.

B. The Contractor is to maintain a full-time on-Site Superintendent, who will be responsible for quality assurance, Contractor health and safety, and competent person(s) for the duration of the Work. The Superintendent will be responsible for the supervision and/or coordination of all Contractor employees, Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, and testing agencies whose services, materials, or equipment are required to ensure the completion of the Work. The Superintendent will have sufficient qualifications, experience, and authority to act as a single point of contact for the on-Site staff, and to adjust the means and methods as needed and as requested by the Engineer/CM.

C. The Contractor is to maintain a dedicated full-time third-party on-Site Health and Safety officer for the duration of the Project. The Health and Safety officer may have no other on-Site responsibilities or duties outside of health and safety.

D. Any material changes to the processes, Subcontractors, staffing, sequencing, equipment, or materials used in the Work will require review and approval by National Grid and the Engineer/CM.

1.03 MEETINGS

A. Attend all Project meetings as deemed necessary by National Grid and/or the Engineer/CM during the term of the Agreement.

B. A post-award meeting will be held at a date, time, and location to be determined to discuss Project submittals, schedule, etc. Attendance at the post-award meeting is mandatory for the Contractor Corporate Sponsor, Superintendent, and Project Manager.

C. A pre-construction meeting will be held at the Site prior to the start of the Work. At a minimum, the Contractor's project manager and Superintendent for the Project will attend the meeting. It is recommended that the Contractor assemble input from primary Subcontractors prior to this meeting.

1. This meeting is intended to make certain that the Work is properly scheduled, responsibilities are coordinated among Subcontractors and suppliers, and that those responsibilities are reflected on the Contractor submittals. Questions concerning the administrative requirements outlined during the pre-construction conference or any other aspect of the Project may also be addressed.

D. Beginning with the mobilization to the Site, the Engineer/CM will facilitate weekly construction meetings for the duration of the Work. The agenda for these meetings will be provided to the selected Contractor after award. Prior to mobilization, if necessary, bi-weekly meetings may be held via teleconference. After mobilization, weekly construction meetings will be held at the Site. Present a progress update at weekly construction meetings that includes tasks completed from the prior week, currently active tasks, and tasks/activities planned for the next two weeks along with an updated project schedule. The format of the two week look ahead must be approved by the Engineer/CM.

E. The standard day and time for the weekly construction meeting will be established based on mutual agreement between the Engineer/CM, National Grid, and other participants. Prepare an agenda prior to each weekly meeting.

F. Special construction meetings will be held at the Site or other designated location to discuss urgent construction issues. The Contractor, Engineer/CM, or National Grid may call special construction meetings. Coordination (agenda, meeting minutes, location, time, and attendance) of special construction meetings is the responsibility of the organization calling the meeting. Special construction meetings will be called judiciously.

G. Minimum attendance at weekly construction meetings will include the Project Superintendent, members of the Contractor staff as may be needed to discuss certain agenda items, and the Contractor project manager (who may participate via teleconference). Attendance is required by a representative of any Subcontractors performing Work at the Site during the time of the weekly meeting.

H. Make physical arrangements for all meetings to be held on the Site.

I. All expenses associated with attending the meetings, except those that are incurred by the Engineer/CM, their representatives, or consultants, are to be borne by the Contractor.

1.04 REQUESTS FOR INFORMATION, CLARIFICATIONS, AND CHANGES

A. All communications regarding discrepancies, claims, and change conditions will be in accordance with the Terms and Conditions.

B. All requests for Project information, clarifications, or changes in the requirements of the Contract Documents must be made in writing to the Engineer/CM.

C. Written requests must be provided regardless of any preceding conversations and preliminary decisions regarding the subject matter(s).

D. At the discretion of the Engineer/CM, e-mail communications may qualify as “requests made in writing” for the purposes of this provision.

E. The Engineer/CM will provide written responses to each request.

F. At their discretion, the Engineer/CM may provide verbal approvals of requests to expedite the Work. In such cases, the Contractor is still required to provide written documentation of the request and approval from the Engineer/CM.

G. The Engineer/CM may also issue clarifications and/or amendments based on their own assessment of Project needs.

H. Any potential increases or decreases in Contractor compensation due to amendments will be in accordance with the provisions of the Agreement.

I. The Engineer/CM will issue the Contractor supplemental instructions authorizing minor changes in the Work that may or may not involve adjustments to the Contract Price or the schedule.

J. If latent or unforeseen conditions require modifications to the Contract, the Contractor will propose changes in the Work by submitting a detailed request to include labor rates, equipment rates, material costs, etc. for a change to the Engineer/CM.

K. Document Change Order requests in accordance with the requirements of the Terms and Conditions, Supplemental Conditions, and any additional procedures set forth during procurement.

L. The Engineer/CM may issue an Authorization for Contract Change (ACC) which instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. An ACC must be authorized and signed by the Engineer/CM and National Grid prior to any change in the Work.

1.05 RECORDS

A. Maintain copies on Site of all Project correspondence and Project documents generated during the Work.

1.06 PRE-MOBILIZATION SUBMITTALS

A. All submittals are subject to review and approval by the Engineer/CM and/or National Grid. Provide all submittals to the Engineer/CM who will then forward them onto the appropriate party for review. Submittals will not be approved until the Engineer/CM has determined that they meet the minimum requirements of these specifications. Claims for lost time or requests for extensions based on rejected submittals will be denied.

B. Contractor Health and Safety Plan

1. Prepare and submit a site-specific third-party Contractor Health and Safety Plan.

2. Refer to the Health and Safety specification section for details on what must be included in the Contractor Health and Safety Plan.

C. Critical Path Method Project Schedule

1. Prepare a Critical Path Method (CPM) project schedule. Update and disseminate the schedule on a weekly basis prior to the weekly construction meetings.

D. Pre-Construction Condition Documentation

1. Perform a pre-construction condition documentation of the Site to 50 feet beyond the Project limits under the supervision of the Engineer/CM.

a. Submit the findings of the pre-construction condition documentation to the Engineer/CM for review and approval prior to mobilization.

b. Include video/photographic documentation of the existing conditions of the Site and surrounding structures.

1) Include video documentation and place particular emphasis on documenting the pre-construction conditions of the structures located on the OU2 Postage Stamp parcel.

c. Claims determined to be resulting from pre-existing structural and/or cosmetic damage to any structures, not identified during the pre-construction survey, will be the responsibility of the Contractor.

E. Schedule of Permits

1. Submit a schedule of Contractor required permits with approximate lead time. Indicate any action items or information required from the Engineer/CM.

2. Submit copies of all supplemental and/or recurring data required by the permits to the Engineer/CM, as needed. Include documentation that the supplemental data was provided to the entity that issued the permit, according to the schedule required by the permit.

3. Submit copies of completed permit applications to the Engineer/CM.

4. Submit copies of fully executed permit applications and final permits to the Engineer/CM.

F. Remedial Action Contingency Plan

1. Prepare a Remedial Action Contingency Plan (RACP). This plan will describe the provisions required for responding to Site-related emergencies that could potentially occur during the Work. The RACP will, at a minimum, contain the following components

a. A spill response plan (SRP) for addressing spills that occur on Site during remedial construction activities. The SRP will describe the means, methods, and facilities required to prevent soil, water, structure, equipment, and material impacts caused by spills; provide information regarding spill containment and cleanup; and provide information related to decontamination measures.

b. Procedures that Contractor's personnel will take in response to an emergency.

c. Designation of an emergency coordinator.

d. Include a current list of all emergency equipment and evacuation plans.

e. Procedures for monitoring weather emergencies and discussion of how weather conditions and notifications will impact Site operations.

f. Procedures and routes for emergency vehicular access/egress.

g. Procedures for the evacuation of personnel from the Site.

h. A listing of contact personnel with phone numbers that, at a minimum, includes Site 911 address, fire officials, ambulance service, local, county, and state police, local hospitals, and a spill response team.

1) Routes to local hospitals, including written directions and a map that depicts the location of the Site relative to the hospital(s).

G. Site Operations Plan

1. Prepare a narrative discussion and drawings describing the means and methods that will be used to execute the Work. The final design will be based on the requirements, intent, and concepts contained in the Contract Documents. Scale drawings included in the Site Operations Plan at no less than 40 feet per inch. At a minimum, the Site Operations Plan will include final submittals with means and methods for the following project elements

a. Shoring and excavation phasing plans for performance of the Work.

b. Manufacturer cut sheets for all products requiring approval by the Engineer/CM prior to being incorporated into the Work.

c. Shop drawings.

d. Security procedures and fencing alignment.

e. Sanitary facility locations.

f. Off-Site parking locations, if used, including routes to and from the Site.

g. List of Subcontractors, including but not limited to, a proposed list of disposal facilities for all anticipated waste streams, shoring Subcontractor (if used), and the Project surveyor.

h. Procedures for gross level decontamination of vehicles.

i. Manufacturers' SDS's and product information for all items used on Site.

j. Staff roles and responsibility summary, including explicit identification of Contractor or Subcontractor staff and qualifications, and who will personally perform and be responsible for the following tasks

i. Site health and safety.

ii. Quality control.

iii. Construction documentation.

iv. For each company performing one of the above roles, include company contact information (address, telephone number, facsimile number, website, etc.). For each person identified in the Site Operations Plan, include a resume with license numbers, if the individual is performing work requiring licensure.

k. Crew size and equipment list for major tasks.

2. The Site Operations Plan may be submitted in parts, so long as all parts are submitted by the submittal deadline. Organize the Site Operations Plan for use in the field and for review. The Site Operations Plan will be reviewed for both

technical content and organization. Include a table of contents, sections and subsections, appendices, tables, drawings, data, etc.

3. All components of the Site Operations Plan are subject to review and approval by the Engineer/CM. This includes, but is not limited to, manufacturer cut sheets, shop drawings, Subcontractor lists, etc. A change to any constituent component of the Site Operations Plan (e.g., a change in a Subcontractor) must be approved by the Engineer/CM.

H. Borrow Source Evaluation

1. Submit a borrow source evaluation for each material type that will be incorporated into the Work.

2. Refer to the Excavation and Fill requirements for details on the required components of the borrow source evaluation submittal.

I. Utility Survey

1. Contact Dig Safely New York to perform a utility markout.

2. Conduct a utility survey of the excavation area using a private utility locating service and markout all suspected utility locations. Confirm all suspected utility locations with the utility provider prior to beginning intrusive activities.

3. Use "soft-dig" techniques (e.g., air knife or hand excavation tools) to positively identify the location and type of on-Site underground utilities.

4. Provide copies of Dig Safely numbers/tickets/utilities plates/private utility location information to Engineer/CM prior to beginning intrusive activities. The Engineer/CM will maintain copies on Site in a clearance package.

1.07 DAILY REPORT

A. Prepare a daily report summarizing the staff and equipment used and the Work performed each Day and anticipated Work for the next Day. The daily report should also list all daily quantities applicable to pay items listed on the Project Price Schedule. The Contractor's internal documentation used for this purpose may be used to fulfill this requirement, subject to approval by the Engineer/CM.

B. At a minimum, the daily report will include the following additional items

1. Summary of any safety-related issues including a summary of the daily safety meeting.

2. Description of any QC testing performed and the results.

3. Excavation and backfill rate for each working Day. Submit certified weight tickets for material exported for off-Site disposal and for each load of imported backfill material (if the basis for payment of the material is by the ton).

4. Estimate of the excavation rate, number of trucks needed for transportation to the disposal facility, and the disposal facility production rate for the next Day.

C. Submit the daily report to the Engineer/CM by 10 AM of the next Day worked.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 30 00

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. This section summarizes the protocol and procedures for the preparation and delivery of required submittals to the Engineer/Construction Manager (CM).

1.02 GENERAL REQUIREMENTS

A. Provide all submittals in .pdf format via email directly to the Engineer and CM. The Engineer/CM reserves the right to request that any submittal be requested via paper copy.

B. Include calculations, shop drawings, plans, reports, records, photographs, diagrams, and details with submittals, as needed, to facilitate the review and/or approval process.

C. For all submittals requested via paper copy, provide five (5) copies to the Engineer/CM unless otherwise directed.

D. If directed by the Engineer/CM, provide submittals electronically in the format requested (i.e. document file, drawing file, image file, etc.). For electronic drawings, submit AutoCAD 2014 (or later) file using the e-transmit feature (i.e. include external references, image files, color table file, font file, line file, etc.). Convert all AutoCAD add on data to AutoCAD format. Use descriptive layer titles (i.e. not numbers or internal use acronyms). Use extensive layer control and use line color by layer and line type by layer management. AutoCAD files of the Contract Drawings will be made available to the Contractor selected to perform the Work, upon request.

E. Certifications must be signed by an officer or other individual authorized to sign on behalf of the entity. Submittals requiring preparation by an engineer or surveyor must be signed and sealed by a Professional Engineer/Surveyor licensed to practice engineering in the State of New York.

F. Schedule submittals to expedite Work. Provide the Engineer/CM a minimum of 15 working Days, excluding transmittal time, for review. The Engineer/CM will coordinate with the NYSDEC and incorporate any comments received from the Department into the Engineer/CM submittal review.

1.03 SUBMITTAL PROCEDURES

A. Develop an unique submittal number by combing the associated technical specification section number with a sequential numeric value. For example, the first submittal provided relative to Section 31 23 00 would be submittal number 312300-001. For revised submittals, use original number and a sequential alphabetic suffix.

B. Use a cover sheet for each submittal. The submittal cover form must be signed by an individual authorized to sign documents on behalf of the Contractor. Include the Project name, Project number, date, submittal number, submittal status (i.e. new or revised), submittal description/title, reference technical specification section and paragraph(s),

submittal exclusions and/or deviations from the Contract Documents, special issues, subcontractor names, remarks, and a certification stating that the Contractor has carefully examined the enclosed documents, verified all field measurements, construction criteria, materials, etc., coordinated the submittal(s) with other submittals and the work of other trades and subcontractors, and that to the best of my knowledge and belief, the enclosed documents are in full compliance with the Contract Documents.

C. Include drawings and details as appropriate.

D. Use the same units of weights and measures on submittals that are used in the Contract Documents.

E. Submit all supplier and Subcontractor submittals.

F. Identify variations from the Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work.

G. Prepare submittals that are complete and contain sufficient detail for review by the Engineer/CM.

H. Resubmit submittals if requested by the Engineer/CM. When performing a submittal revision, identify all changes made since previous submission. For each resubmittal allow the same number of workdays required for review as the original submittal.

I. Submittals not requested will not be recognized or processed.

1.04 SUBMITTAL REGISTER

A. Maintain a technical submittal register at the Site. Including the submittal number, description, date submitted, status, and date of approval/rejection.

1.05 SUBMITTAL REVIEW

A. Submittals will be reviewed solely for the purpose of evaluating whether the information contained in the submittal conforms to the design concept of the Contract Documents. Submittals will be returned with the following classifications

1. No Exceptions Taken: Work may proceed.
2. Furnish as Corrected: Work may proceed subject to comments, resubmittal not required.
3. Revise and Resubmit: Work may not proceed, resubmittal required for indicated items. Proceed with Work on other items subject to comments.
4. Rejected: Work may not proceed, resubmittal required, submittal unresponsive and/or not in conformance with Contract Documents.
5. For Information Only: Submittals that are not requested by the Engineer/CM or required by the Contract Documents.

B. Engineer/CM's review is for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Review is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions or quantities. Approval of a specific item does not constitute approval of an assembly of which the item is a component. The Engineer/CM's review

and approval of the Contractor's submittals does not relieve the Contractor from complying with the requirements of the Contract Documents. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; fabrication processes and construction means, methods, techniques, sequences or procedures; coordination of the Work of all trades; and performing all work in a safe and satisfactory manner.

1.06 PRODUCTS AND MATERIALS

A. Refer to the requirements of the NYSDOT Standard Specifications (latest edition) if no specific requirements are provided in the Contract Documents.

1.07 CERTIFICATES OF COMPLIANCE

A. Submit any certificates required for demonstrating proof of compliance with the Contract Documents to the Engineer/CM as part of the submittal package.

B. Certificates must be signed by an official authorized to sign on behalf of the manufacturing, analytical testing company, or organization providing the material and/or service.

C. For each certification, include the name and address of the Subcontractor, name of the requestor, the Project name and location, relevant test data (if required), and the dates of shipment and delivery.

D. Certifications do not relieve the Contractor from furnishing satisfactory materials.

1.08 INVOICES

A. Submit monthly invoices in accordance with the provisions of the Terms and Conditions and Supplemental Conditions.

1. Submit invoices on an approved form with an updated schedule showing contract values, approved Change Orders, Work completed to date, current invoice and quantity amounts, and balance to complete for each bid item.

2. Invoices must be reviewed and approved by the Engineer/CM prior to formal submission for payment.

3. No payment will be made unless all the proper supporting documentation has been submitted and approved by the Engineer/CM.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 33 00

SECTION 01 35 00

SPECIAL PROCEDURES - HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required to conform to all health and safety requirements during the performance of the Work.

1.02 SUBMITTALS

A. Prior to mobilization, submit the Contractor's Health and Safety Plan (HASP), and documentation of OSHA training and enrollment in medical monitoring for Site personnel.

B. Contractor's Monthly Safety Report, which, at a minimum, will consist of the following components

1. The names of all Contractor and Subcontractor personnel employed at the Site at any time during the month and the names and duties of key personnel including Contractor's project manager, Superintendent, safety officer, and competent person(s).

2. A summary of all Health and Safety incidents that describes any medical treatment that was provided during the month, the status of any individuals affected, the names of individuals who may have observed the incident, and actions taken by Contractor to address the unsafe act or unsafe condition.

3. A summary of all Health and Safety near-misses or observations providing an opportunity for shared learning and future hazard avoidance. For any Health or Safety incident or near-miss, list the date, the nature of the incident or near-miss, and the names of individuals involved.

4. The total number of labor hours worked at the Site during that month.

5. Internal Health and Safety audits performed by the Contractor as part of the Contractor's HASP.

C. Submit a hot work permit for any welding, torch cutting, or activities that generate sparks. If the Contractor does not have a permit readily available, they may request a permit from the Engineer/Construction Manager (CM). In some instances, the Owner may require the use of their specific permit and permitting process.

D. Contractor shall conduct a job safety analysis (JSA) for significant activities and submit the documentation to the Engineer/CM for review prior to the start of the activities. Submit the JSA on a form acceptable to the Engineer/CM.

E. Submit copies of all periodic equipment inspections completed.

1.03 REFERENCES

A. Applicable regulations and publications include, but are not limited to, the following:

1. ACGIH, Threshold Limit Values and Biological Exposure Indices (most recent version).
2. ANSI, Emergency Eyewash and Shower Equipment, Z358.1, 1981.
3. ANSI, Practice for Occupational and Educational Eye and Face Protection, Z87.1, 1979.
4. ANSI, Practices for Respiratory Protection, Z88.2, most recent version.
5. ANSI, Protective Footwear, Z41.1, 1983.
6. ANSI, Respirator Use Physical Qualification for Personnel, Z88.6, 1984.
7. DHHS, "Manual of Analytical Methods," 3rd edition Volumes I and II, DHHS (NIOSH) Publication 84-100.
8. DOT Standards and Regulations, 49 CFR 171, 49 CFR 172 and 49 CFR 214.
9. NESHAP (40 CFR 61 Subpart M), National Emission Standards for Hazardous Air Pollutants: Asbestos.
10. NFPA, Flammable and Combustible Liquids Code, NFPA 30, most recent revision.
11. NIOSH Pocket Guide to Chemical Hazards, DHHS/PHS/CDC/NIOSH, August 2006 or most recent.
12. NIOSH/OSHA/USCG/USEPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS/PHS/CDC/NIOSH, October 1985.
13. OSHA, Title 29 CFR Part 1910, Occupational Safety and Health Standards, in particular 1910.134, Respiratory Protection; Title 29 CFR Part 1926, Safety and Health Regulations for Construction Sites, in particular 1926.1101, Asbestos, and 1926.62, Lead.
14. OSHA, Title 49 CFR Part 214, Roadway Workplace Safety.
15. USEPA, Health and Safety Requirements for Personnel Engaged in Field Activities, USEPA Order No. 14402.
16. USEPA, Standard Operating Safety Guidelines, November 1984.

B. Except to the extent that more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect and are made a part of the contract documents by reference as if copied directly into the contract documents, or as if published copies are bound herewith.

C. Where two or more regulations/documents conflict, the one(s) offering the greatest degree of protection shall apply.

1.04 CONTRACTOR'S RESPONSIBILITY FOR HEALTH AND SAFETY

A. Comply with any and all applicable state, federal, and local ordinances, laws and regulations.

B. The Contractor is responsible for the Health and Safety of its employees, its Subcontractors, suppliers, agents, inspectors, visitors, the general public, and any Others associated with, or interacting with Contractor who provides labor, goods, or other services on the Site.

C. The Contractor is responsible for emergency response planning and notification and for actual response to any and all emergencies that may occur during the course of the Work, including emergencies that may occur when Contractor is not present at the Site.

D. The Contractor is responsible for communicating daily with the Engineer/CM regarding Health and Safety issues for the safe conduct of the Engineer/CM's duties, but such communication shall not imply any duty or responsibility on the part of the Engineer/CM with regard to Health and Safety of Contractor's employees, its Subcontractors, suppliers, the general public, or Others. The Engineer/CM's responsibility and duty with regard to Health and Safety shall be limited to their employees. Communicate Health and Safety issues accurately and in a timely manner to allow the Engineer/CM and take appropriate actions to protect the Engineer/CM's employees and the Owner's employees.

E. Designate a third-party Site Safety and Health Officer (SSHO) who, at a minimum, has at least 5 years of experience as an SSHO on an uncontrolled hazardous waste site, is 40-hour OSHA Hazardous Waste Operations trained, and 8-hour OSHA Supervisor trained.

F. The SSHO shall enforce the health and safety requirements for all Contractor personnel on Site at all times. The SSHO shall ensure that all Contractor personnel, Subcontractor personnel, and Contractor visitors follow the Contractor's site Health and Safety Plan (HASP), including wearing the designated level of Personal Protective Equipment (PPE). If the SSHO elects to require a higher level of protection than that specified in the Engineer/CM's HASP, the extra costs associated with such higher level shall be borne by Contractor, unless such extra costs are approved in advance in writing by the Engineer/CM.

G. Prior to mobilization and continually through the duration of the Work, the SSHO shall inspect the Site and document area-specific and worker-specific protection requirements.

H. After mobilization, the SSHO shall monitor Work activities and document the need for additional worker protection, as required, based on the Work being performed and action levels specified in the Contractor HASP.

I. The SSHO shall verify that all activities are performed in accordance with the HASP and all federal, state, local, and Health and Safety standards, Laws and Regulations, and guidelines.

J. In the event of a health or safety risk, as determined by the SSHO, other Contractor personnel, or by the Engineer/CM, stop Work until a method for handling the risk has been determined and implemented in consultation with the Engineer/CM. Report any health or safety risk resulting in a Work stoppage to the Engineer/CM.

K. The Contractor is responsible for implementing a behavior-based safety process and providing site training, observation, and feedback for Contractor personnel employed at the Site.

L. The Contractor is responsible for the stability of excavations and embankments created as part of the Contractor's Work. Designate one competent person as defined in 29 CFR Part 1926, Subpart P, Excavations, to inspect and document excavation safety conditions daily and to ensure excavation safety prior to any personnel entering an excavation.

M. The Engineer/CM will provide the Contractor with a copy of the Engineer/CM's HASP as a reference. The Contractor is responsible for preparing their own HASP under which their employees will perform the Work.

1.05 CONTRACTOR'S HEALTH AND SAFETY PLAN

A. Prepare and submit a Site-specific Health and Safety Plan (HASP) to the Engineer/CM prior to the start of the Work. Follow all applicable local, state, and federal Health and Safety standards, Laws and Regulations, and guidelines implemented through, but not limited to, the OSHA, NIOSH, ACGIH, and USEPA. Where these references are in conflict, follow the more stringent requirement. Third party SSHO will enforce the HASP. At a minimum, address the following topics in the Contractor HASP

1. Names of key personnel and alternates responsible for Health and Safety, including a Contractor Health and Safety Representative and SSHO.
2. A Health and Safety risk or JSA associated with each portion of the Work (i.e., list potential chemical and physical hazards), including JSAs for material handling, separation, sizing, stockpiling, loading, transportation, and disposal.
3. Documentation of employee and Subcontractor training and medical certifications required by 29 CFR 1910.120, as described in Part 3 of this Section.
4. A requirement that Contractor locate Underground Facilities by using "Safe Dig" procedures prior to the start of the Work.
5. PPE to be used for each of the tasks and operations being conducted, as required by the PPE program in 29 CFR 1910.120, 29 CFR Subpart I, and 29 CFR 1926.
6. Medical surveillance requirements in accordance with the program in 29 CFR 1910.120.
7. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used by the Contractor, including methods of maintenance and calibration of monitoring and sampling equipment.
8. Corrective actions and upgrading of PPE based on monitoring of air, personnel, and environmental sampling, with specific Action Levels identified.
9. Site control measures in accordance with the control program required in 29 CFR 1910.120 and 29 CFR 1926.
10. Decontamination procedures in accordance with 29 CFR 1910.120 and the Contract Documents.

11. If confined space entry is required, include confined space entry procedures in accordance with 29 CFR 1910.146, and a list of all anticipated confined space entries required by Contractor in the course of the Work.
12. A list of Health and Safety and emergency equipment available on the Site.
13. A description of engineering controls used to reduce the hazards of equipment operation and exposure to site hazardous chemicals.
14. An air monitoring plan describing the method, type, frequency, locations of air monitoring, laboratories, and type of analysis to be performed at the Work area for the purpose of employee safety.
15. Open trench excavation procedures in accordance with applicable OSHA Regulations, if required.
16. Documentation of training and experience for the designated excavation-competent person.
17. Procedures for earthwork near buried utilities, where hand digging should be performed within 24 inches of known utility lines unless more stringent requirements are specified by laws or regulations, or the affected utility.
18. Training for emergency response procedures HASP.
19. Heat stress program consistent with the references provided in the Engineer/CM's HASP.
20. Cold stress program consistent with the references provided in the Engineer/CM's HASP.
21. Lockout/Tagout procedures where the sudden start up or release of stored energy could cause injury to personnel.

1.06 NOTIFICATIONS

A. Immediately verbally report to the Engineer/CM and the National Grid Project Manager the occurrence of any and all Health and Safety incidents. Assist the Engineer/CM in the preparation of an Accident/Incident Report form, which must be completed within 3-hours of the incident.

B. Immediately stop work and fully investigate any such incident or near-miss and conduct a root cause analysis. Submit to the Engineer/CM the Contractor's written corrective action plan within 1 day of the incident occurring.

C. No elements of the Work will be allowed to continue until after an investigation has been performed and it is determined that it is safe to proceed. If the incident is caused by the negligence of the Contractor, neither National Grid nor the Engineer/CM will be responsible for any costs associated with project delays.

D. Notify the Engineer/CM in writing at least 5 days prior to bringing any hazardous material, equipment, or process to the Site. Provide the Engineer/CM with an Safety Data Sheet (SDS) for all chemicals brought on to the Site.

E. Immediately notify the Engineer/CM in writing of any hazard the Contractor discovers or observes on the Site, and immediately stop Work until corrective measures are taken to

eliminate or minimize the hazard. Hazard reporting will be completed as a near miss report.

PART 2 PRODUCTS

2.01 EQUIPMENT AND FACILITIES

A. Provide all equipment, temporary facilities, and personnel required to perform activities on Site safely in accordance with all applicable laws and regulations and the Contractor's HASP.

2.02 PERSONAL PROTECTIVE EQUIPMENT

A. The appropriate level of PPE is to be determined by the Contractor for the specific tasks as described in the Contractor's HASP. If hazards are identified that require a level of protection greater than Level C (defined in paragraph D below), Work shall be suspended and the Engineer/CM notified. The Contractor's SSHO, in consultation with the Engineer/CM, will determine what corrective actions are required prior to restarting Work. Determine and document the appropriateness of the suggested minimum PPE requirements for Contractor's personnel and Others at the Site.

B. Furnish and maintain materials and equipment for the Health and Safety of Contractor employees, its Subcontractors, Suppliers, and visitor personnel. Provide all required Health and Safety equipment, first aid equipment, tools, monitoring equipment, PPE, and ancillary equipment and methods required to ensure workers' Health and Safety and to comply with the Contractor's HASP.

C. Level D protection will be required at all times for all personnel and visitors on the Site, except in Support Zone areas. Level D PPE consists of

1. Hard hat.
2. Steel-toed boots.
3. Safety glasses with permanent side shields.
4. Work clothes (long pants, shirts with sleeves).
5. Work gloves.
6. High visibility reflective safety vests.
7. Hearing protection (as needed to prevent exposure exceeding 85 dB level).

D. If additional protection consisting of Level C PPE is required during the Work, Level C PPE shall include protection from dust particulates and entrained heavy metals and consist of Level D protection with the following additions

1. Air purifying respirator, half-face or full-face (depending on required protection factor) with high efficiency particulate air cartridges meeting NIOSH Specifications. The presence of chemical vapors during certain activities (e.g., painting) could trigger the need for additional respiratory protection.
2. Disposable poly-coated chemically protective coveralls.

3. Disposable chemically resistant outer gloves (nitrile).
4. Disposable chemically resistant inner gloves (nitrile).
5. Chemically resistant, steel-toed, and steel-shanked boots (polyvinyl chloride, neoprene, or nitrile), or outer booties.

E. In most cases, Level C will be the maximum allowable level of PPE. Level B may be allowed provided that personnel are properly trained and certified, and exposure levels are below immediately dangerous to life and health (IDLH) conditions.

F. In cases where the Owner requires additional PPE, the Engineer/CM will notify the Contractor of these additional requirements in advance of mobilization so that Contractor may obtain the necessary equipment.

2.03 OTHER HEALTH AND SAFETY EQUIPMENT

A. Maintain the following equipment available on the Site for the health and safety of Contractor, Subcontractors, suppliers, and visitors

1. First aid kits.
2. Fire suppression equipment (appropriate to location and type of flammable materials present). Equipment will be certified ready for use within the previous 12 months and will also have been inspected each month; maintain documentation supporting certification and inspections available for review.
3. Emergency eyewash facilities meeting OSHA specifications.
4. Personnel decontamination facilities and equipment.
5. Flammable liquids storage cabinet(s), if necessary.
6. Personnel air monitoring equipment.
7. Confined space entry equipment, if necessary.
8. Fall protection equipment appropriate for the hazards on the project.
9. Heavy blankets.
10. Other equipment or supplies as determined to be necessary or prudent by Contractor or the Engineer/CM.

PART 3 EXECUTION

3.01 WORKER QUALIFICATION

A. Provide the following training to workers, except those who will be restricted to the Support Zone

1. Initial 40-hour OSHA hazardous waste Health and Safety training and current annual 8-hour refresher training.
2. Eight-hour OSHA hazardous waste supervisory training (required for the Contractor's Superintendent and SSHO).

3. Enrollment in a medical monitoring program, with clearance within the previous 12 months from a licensed physician allowing the worker to participate in field activities and use respiratory protective equipment.

4. Current respiratory fit testing certification for workers who may be required to work in Level C PPE.

5. Current cardiopulmonary resuscitation (CPR) and first aid certification for at least two workers assigned to Work on the Site.

6. Confined Space Entry Training for workers entering confined spaces.

7. For any worker who is assigned the role of a "competent person," provide documentation of sufficient and relevant training and experience to perform the assigned duties and responsibilities of that role. As defined in 29 CFR 1926.31, the competent person shall be "one who is capable of identifying existing and predictable hazards, and who has authority to take prompt corrective measures to eliminate them." Relevant training and experience shall be in the same type of Project activities included in the Work under this Contract.

B. Designate one "competent person" as defined in 29 CFR Part 1926, Subpart P, Excavations, to inspect and document excavation safety conditions daily and to ensure excavation safety prior to any personnel entering an excavation, if required.

3.02 WORK PLANNING AND MEETINGS

A. Conduct a daily health and safety meeting, prior to beginning Work for that day, to address health and safety issues, changing site conditions, activities, and personnel. All Contractor and Subcontractor employees working on the Site on that day must attend the meeting. Document all meetings and have attendees sign a form acknowledging their presence at the meeting. Include as part of the daily meeting, an evaluation of the Work to be conducted, the hazards associated with the work, and the control measures being used to reduce exposure.

B. Contractor personnel who are not in attendance for the daily Health and Safety must be briefed on the meeting notes prior to commencing any Work-related activities.

C. Hold and document additional safety meetings at the start of each major task, and whenever site conditions change such that it could potentially affect worker safety. Any major task undertaken requires the completion of a JSA as described in this Section.

3.03 ENGINEERING CONTROLS

A. Provide the following engineering controls, as required, to complete the Work, to reduce the hazards of equipment operation and exposure to impacted materials

1. Roll-over cages for bulldozers, back hoes, loaders, and tractors.

2. Back-up alarms for all trucks and moving equipment.

3. Water source with sufficient volume and pressure to reach all areas of the Work. Use the water source for wetting debris, soil and other media to control dust during the Work.

4. Decontamination of personnel and equipment in accordance with the requirements provided in the Contract Documents.
5. Barricades for open trenches and excavations.
6. Bars or cages for cabs of equipment as deemed necessary to resist damage and eliminate risk of injury during material and debris handling.
7. Sloping, benching, shoring, drainage systems, or other controls as necessary to ensure stability of excavations and embankments.
8. Others controls as determined to be necessary or prudent by Contractor or as directed by the Engineer/CM.

B. Post ground-level warning signs every 50 feet below all overhead utilities on Site, as needed.

3.04 MONITORING

A. Perform heat exposure and cold exposure monitoring activities as required by weather conditions.

B. Perform all air monitoring activities described in the Contractor's HASP required to provide health and safety protection to the Contractor and Subcontractor personnel.

C. If working with asbestos-containing materials, the following monitoring may be required by the Engineer/CM

1. Perform exposure assessment air monitoring as required by OSHA 29 CFR Part 1926.1101 to determine the airborne concentrations of asbestos to which workers may be exposed. Use air samples that are representative of an 8-hour time-weighted average (TWA) and a 30-minute excursion limit (EL) to determine exposure levels.
2. Representative TWA worker exposures shall be determined on the basis of one or more samples representing full-shift exposure for workers in each regulated work area. Representative short-term worker exposures shall be determined on the basis of one or more samples representing 30-minute exposures associated with operations that are most likely to produce exposures above the EL for workers in each regulated work area.
3. Conduct daily air monitoring that is representative of the exposure of each worker who is assigned within a regulated work area, unless the Contractor has made a negative exposure assessment for the entire operation.
4. Institute exposure monitoring whenever there is a significant change in process, control equipment, personnel, or work practices that may result in new or additional exposures above the PELs, or when there is any reason to suspect that a change may result in new or additional exposure above the PELs.
5. Conduct, or otherwise provide for personnel air sampling of abatement personnel employed on the project, including daily 8-hour TWA and 30-minute Short Term Excursion Limit (STEL) air sampling, as required by OSHA 29 CFR Part 1926.1101. Personnel 8-hour TWA and 30-minute STEL samples shall be

analyzed for asbestos fibers by Phase Contrast Microscopy (PCM) and the results shall be conspicuously posted at the project site within 72 hours of collection.

6. Perform all asbestos sampling for the Project Site and provide all necessary documentation to comply with state and federal asbestos regulations.

D. The perimeter air monitoring plan will be implemented by Others, the Contractor is responsible for work zone air monitoring.

E. Pay all costs associated with sampling and analysis to comply with OSHA regulations, outside of those associated with the perimeter air monitoring plan being performed by Others.

3.05 EVALUATION OF PERFORMANCE

A. Conduct internal safety audits on Subcontract and sub-subcontract Work zones in accordance with the Contractor's HASP. The focus of these routine audits will focus on compliance with OSHA, and local, safety regulations.

B. Conduct routine behavioral observations and provide immediate feedback during Work activities to promote safe behavior of Contractor and Subcontractor employees.

END OF SECTION 01 35 00

SECTION 01 41 00

REGULATORY REQUIREMENTS - PERMITS

PART 1 GENERAL

1.01 SUMMARY

A. This Section establishes responsibility for obtaining Project permits between the Engineer/Construction Manager (CM) and the Contractor.

1.02 ENGINEER/CM PERMITS

A. The Engineer/CM will obtain the following Project permits

1. Approvals from the NYSDEC.

1.03 CONTRACTOR PERMITS

A. Obtain the following Project permits

1. Permit from the City of Schenectady Publicly Owned Treatment Works (POTW) for the discharge of treated effluent to the City's sanitary sewer system.
2. NYSDEC permit/approval for the temporary dewatering discharge.
3. Local construction permits.
4. Permits required for any off-Site parking that is negotiated between the Contractor and the City of Schenectady, and/or private parking facilities, as needed.
5. Permits/notifications required by the City of Schenectady.
6. Temporary road closure permits.
7. Any other permits required to complete the Work.

B. This Section does not describe all permits required for performance of the Work. Any permits not identified in this Section, or elsewhere in the Contract Documents, are the responsibility of Contractor.

C. Regardless of who is responsible for obtaining a permit, the Contractor is responsible for performing in accordance with the terms and conditions of all permits.

D. Provide any technical and equipment related data required by the Engineer/CM.

1.04 COORDINATION/ASSISTANCE

A. The Engineer/CM will coordinate delivery of Contractor submittals to regulatory agencies, as may be required.

B. Provide all data requested by the Engineer/CM to support permit applications. When necessary, the Engineer/CM may provide data summaries or other Project information in support of Contractor permit submittals.

C. Any coordination and/or assistance between the Contractor and the Engineer/CM are provided in the interest of expediting the Project. Provision of coordination and/or assistance does not relieve the Contractor of any obligations in obtaining the required permits.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 41 00

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, equipment, supplies, laboratory testing, materials, and performing all operations required for providing temporary facilities and controls during the performance of the Work.

1.02 WORK ZONES

A. Establish a Secured Zone, Support Zone, Exclusion Zone, and Decontamination Zone, as defined herein.

1. Lay out the Work Zones and establish boundaries, barriers, facilities, and controls to ensure that all personnel and equipment exiting the Exclusion Zone pass through the Contamination Reduction Zone before entering the Support Zone and before exiting the Site.

2. Furnish, install, and maintain in good condition, orange plastic mesh fencing secured to metal posts to delineate the boundaries between Work Zones, including the Exclusion Zone, Contamination Reduction Zone, and Support Zone. Install orange plastic mesh fencing at the entrance of the Exclusion Zone for a clear demarcation for Site workers.

B. Establish a general Secured Zone that excludes unauthorized personnel from entering the Site.

1. Control access to the secure zone by installing a temporary steel chain-link fence as shown on the Drawings.

2. The Engineer/Construction Manager (CM), and Owner shall be allowed free access to the Secured Zone 24 hours per day, subject to appropriate safety precautions. Providing the Engineer/CM and Owner with access to the Secured Zone does not in any way relieve that Contractor of the responsibility for maintaining Site security during the performance of the Work.

3. Maintain a log sheet on which all Contractor personnel and visitors must sign in and out upon entering or leaving the Secured Zone.

4. The Contractor is solely responsible for the security and safety of equipment, facilities, personnel, and materials within the Secured Zone.

C. Establish a Support Zone for field offices, storage, sanitary facilities, hand-washing facilities, and non-construction vehicle parking.

1. The Support Zone shall be an area that is free of physical and chemical hazards.

2. Maintain the Support Zone in a safe, clean, orderly, and sanitary manner at all times.

D. Establish the limits of the Exclusion Zone using the following criteria in addition to any other criteria that may be deemed necessary by the Engineer/CM

1. Open excavation areas.
2. All stockpile areas.
3. All areas where impacted materials are present at the ground surface.
4. OSHA Regulations and all other applicable Laws and Regulations.

E. Establish a Contamination Reduction Zone between the Support Zone and the Exclusion Zone.

1. Provide suitable facilities for personnel decontamination in the Contamination Reduction Zone, including portable toilets, boot wash, emergency eyewash and a water hand washing station.
2. Construct a vehicle and equipment decontamination pad that allows for the capture of solid residuals and evaporation/infiltration of liquid residuals generated during decontamination of construction vehicles and trucks bound for off-Site disposal facilities.
3. The vehicle and equipment decontamination facility will be sufficiently sized to ensure the largest piece of equipment can be adequately decontaminated.
4. If requested by the Engineer/CM, provide splash protection around the vehicle decontamination facility. Design splash protection to minimize potential contamination from splatter and mist during the vehicle and equipment decontamination process. If directed, furnish splash protection that is stable and capable of being dismantled in the event of high winds.
5. Provide a method for the transport of wastewater generated during decontamination procedures to be containerized.

PART 2 PRODUCTS

2.01 MATERIALS AND FACILITIES

A. All furnished materials must be suitable for their intended use and conform to all applicable codes and standards.

B. Provide appropriate first aid supplies in accordance with all applicable and relevant Federal, State, and local regulations.

C. Provide a sufficient number of self-contained, single occupancy toilets with chemical flush, aerated re-circulation, which are properly vented and fully enclosed with fiberglass or other nonabsorbent material. At a minimum provide two single occupancy toilets outside of the exclusion zone. Designate one toilet as “Women Only.” These toilets must be serviced at a minimum of once a week.

D. Provide fully equipped hand wash stations outside of toilets and in the personnel decontamination area.

E. Provide separate, dedicated, temporary on-Site office space and workstations for Engineer/CM and CAMP technician. At a minimum provide a space that includes electricity, internet service, 2 telephone lines, air conditioning, and heat. Equip each work station with a desk, chair, telephone, and a printer/scanner/copier machine.

F. Provide two-way radios with spare batteries for the exclusive use of the Engineer/CM and CAMP technician. The radios provided to the Engineer/CM and CAMP technician must be able to receive and send on all frequencies to be used by the Contractor during the performance of the Work.

G. Provide and maintain a sufficient supply of materials/equipment required to implement decontamination procedures, including, but not limited to, the following items

1. Plastic trash barrels.
2. Liners for trash barrels.
3. Wash basins.
4. Alconox™ or approved equivalent detergent concentrate.
5. Hand pump sprayers.
6. Long handled soft bristle brushes.
7. Large sponges.
8. Cleaning wipes for respirators.
9. Bench or stool(s).
10. Stepladder(s).
11. Steam generator.
12. Liquid detergent and paper towels.
13. Plastic trash bags.
14. Supplies and equipment to construct the decontamination pad.

H. Install an 8-foot tall temporary perimeter fence to create a secure Site perimeter.

1. Install a temporary privacy screen around the perimeter fence.
2. If needed, provide additional reinforcement to prevent damage to the fence during periods of high wind from the addition of the privacy fabric. Promptly repair any damage to the fence and/or privacy fabric.
3. Furnish, install, and maintain all other proposed temporary fencing, gates, and barriers around impacted areas as required by the Contract Documents, and as may be needed to complete the Work.
4. Furnish and post signs at every entrance and gate, and at not less than every 50 feet along the fence warning the general public that the Site contains physical and chemical hazards, and that access is forbidden to unauthorized persons.

I. Furnish and post a professionally lettered sign, of a minimum size of 4 feet by 4 feet, at each entrance, or gate to the Site with the following text, or other similar text approved

by the Engineer/CM. "All Personnel and Visitors Beyond This Point Must Wear Hard Hat, Safety Glasses, High-Visibility Reflective Vest, and Steel Toe Boots." Additionally, furnish the DEC MGP remediation sign as detailed in the Contract Drawings.

J. Provide Rusmar AC 645 Long Duration foam or Engineer/CM approved equivalent. Provide two foam application units with a minimum capacity and flow rate equal to or in excess of the RUSMAR PFU 400/25.

PART 3 EXECUTION

3.01 GENERAL

A. Operate and maintain all equipment and systems to ensure that that the temporary facilities, controls, utilities, and other services are provided without disruption.

B. Design, furnish, install, and maintain all temporary Site facilities and controls required for the performance of the Work.

C. Provide and maintain all temporary environmental controls, as necessary for protection of the environment, throughout the performance of the Work.

D. Provide and maintain proper barricades and warning signs at all closures, holes, hazards, and equipment areas.

E. Ensure that all Subcontractors comply with the provisions of the Contract Documents.

3.02 SANITARY FACILITIES

A. Empty the sanitary facilities before the capacity is exceeded, or on a weekly basis, whichever occurs first. Clean sanitation facilities concurrently with emptying.

B. Clean and restock hand wash stations as needed.

3.03 TEMPORARY UTILITIES

A. Provide suitable decontamination water for the duration of the Project.

B. Supply potable drinking water for on-Site personnel.

C. Provide all temporary utility services in accordance with this Specification for the duration of the Project. This includes, but is not limited to, installation, operation, maintenance, and removal of all equipment and/or systems required to ensure uninterrupted service and paying all fees associated with installation, connection, service, and shut-off.

D. There are no on-Site utility connections currently available for use.

3.04 PERSONNEL DECONTAMINATION

A. Comply with all requirements of the Contractor Health and Safety Plan.

B. Provide the means for the Engineer/CM, visiting regulatory agency representatives, and CAMP technician to comply with the Contractor Health and Safety Plan.

C. Provide a decontamination station where personnel can drop equipment and remove personal protective equipment (PPE).

1. Equip the decontamination station with basins for water and detergent, and trash bags or cans for containing disposable PPE and other discarded materials.
2. Supply a sink as a secondary means of personal hygiene for personnel.

3.05 EQUIPMENT DECONTAMINATION

A. Install decontamination equipment in accordance with the Contract Drawings.
   1. Locate and operate a decontamination pad at any point that equipment leaves the Site.
   2. Provide a decontamination pad of sufficient size to ensure that the largest piece of equipment can be adequately decontaminated.

B. Remove heavy contamination using a broom and/or brushes within the excavation area prior to movement to the decontamination pad.

C. Perform heavy equipment decontamination within the limits of the decontamination pad.

D. Pressure wash heavy equipment before it departs the Site, as needed.

E. Decontaminate any equipment used to excavate impacted materials prior to backfilling.

F. Collect and pump wastewater from equipment decontamination into the wastewater treatment system.

G. Collect and remove soils from the decontamination pad and bulk with excavated materials for disposal.

H. There is insufficient space on Site to construct an anti-tracking pad. Place added emphasis on the cleaning of vehicles tires on the decontamination pad prior to the vehicle departing the Site.

3.06 SITE SECURITY

A. Take every security precaution necessary to prevent any unauthorized access to the work area, and to control construction traffic to and from the Site.

B. The Contractor may, at their discretion, provide manned overnight security during the performance of the Work at no additional cost to National Grid.

C. Security personnel employed during non-working hours must, at a minimum, meet the following requirements:
   1. Be literate in the English language.
   2. No access to or use of any weapon or restraint tools.
   3. Have access to a telephone.

D. Security personnel must be briefed on all hazards present and instructed not to enter any exclusion zones and to avoid any potential exposure to contaminated wastes.

E. Establish written Site security procedures as part of the Site Operations Plan. At a minimum, the procedures will include
   1. Roles and responsibilities of personnel involved with Site Security.

2. Description of proposed daily security operations.
3. Method and frequency for conducting security checks.
4. Sign in/sign out procedures.
5. Location of security station.
6. Description of how a breach of security will be handled. A breach of security consists of unauthorized personnel accessing or attempting to gain access to the Site, broken fences and unlocked gates.
7. Communications.

F. List of personnel to be contacted in case of emergency.

3.07 DUST, ODOR, AND VAPOR CONTROLS

A. Apply odor-suppressing foam to the excavated material when stockpiled, during excavation and loading operations, or at any other time and location as directed by the Engineer/CM.

B. Provide the labor, equipment, and materials required to apply odor and vapor suppressant foam to all exposed excavated material, including stockpiles, within 5 minutes of the start of intrusive activities, or when directed by the Engineer/CM. No separate payment will be made for the supplying and operation of vapor/odor control equipment. Payment for vapor/odor suppression materials will be as per the unit bid price. Failure to apply vapor/odor suppression materials within the specified time will result in all Work being suspended until such time as the Engineer/CM feels the request for controls has been fully satisfied. No additional payment for such downtime shall be due to the Contractor.

C. Maintain sufficient materials on hand to apply foam as directed during the entire period when intrusive work is being performed.

D. Cover all exposed stockpiles with a secured polyethylene tarp if left untouched for longer than 2 hours. Provide an equivalent covering for all excavated material stockpiles left overnight.

E. Provide dust control at the approved offload point using water trucks, hoses, or engineered dust suppression materials, as needed.

F. Notification will be provided when real time monitoring being performed at the Site perimeter indicates levels have reached 10% of the action levels specified in the CAMP for a 10-minute period. Upon notification, immediately begin to implement dust and odor/vapor controls.

END OF SECTION 01 50 00

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Closeout procedures covers the administrative and technical requirements for final cleaning, inspection, Project as-built documents, system demonstrations and adjustments, warranties, bonds, final payment, and other procedures for Project closeout in accordance with the Contract Documents.

1.02 CLOSEOUT PROCEDURES AND REQUIRED SUBMITTALS

A. Substantial Completion

1. When the Contractor considers the Work, or designated portion thereof, to be at Substantial Completion, provide written notice, with a list of items to be completed or corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. The Engineer/Construction Manager (CM) will inspect the Work to determine the status of completion.
3. If the Engineer/CM determines that the Work is not at Substantial Completion, the Contractor will be notified of the deficiencies in writing.
4. The Contractor will, within two (2) days of the written notice, provide a schedule for when all defects will be corrected and/or the Work completed for the Engineer/CM to review.
5. Upon approval from the Engineer/CM, correct any deficient and/or incomplete Work and notify the Engineer/CM upon completion. The Engineer/CM will then re-inspect the Work for the purpose of Final Acceptance.

B. Project Closeout Report

1. Submit a Project closeout report that includes the following information
2. Total quantities for unit price pay items.
3. Variations from the Contract Documents.
4. Discussion of major issues encountered during the performance of the Work and the resolution.
5. A complete list of all Contractor personnel who performed Work on Site.
6. As-Built drawings. The specific requirements for record drawings that are to be submitted as part of this report are contained in subparagraph 1.2, C of this section.
7. Supporting documentation. The specific requirements for the required supporting documentation that is to be submitted as part of this report are contained in subparagraph 1.2, D, E, and F of this section.

C. As-Built Drawings

1. Provide as-built drawings that have been collected, developed, signed, and sealed by a surveyor licensed to practice in the State of New York as part of the Project closeout report. Submit as-built surveys in AutoCAD 2018 and include all relevant points, TINs, surfaces and all other Civil3D data. Submit a PDF of the final deliverable, stamped by the PE or PLS responsible for developing the as-built drawings, and provide five stamped hard copies to the Engineer/CM. At a minimum, as-built drawings are to include

   a. Encountered structures left in place.

   b. Encountered pipes or other subsurface features that were removed, encountered pipes or other subsurface features that were not removed, and the terminal ends of cut/capped pipes.

   c. Utility locations, elevations, and inverts.

   d. Horizontal and vertical extents and elevations of excavation support system, remedial excavation, and backfill layers.

   e. Final conditions, site features and topography.

   f. Benchmark coordinates and elevation.

2. Final quantities that were designated to be calculated by survey are to be included on the as-built drawings. The applicable record drawing must clearly indicate the pay item and final total quantity of measured units.

D. Provide copies of all Project records including, but not limited to, the following

1. Manifests and bills of lading.

2. Weight tickets.

3. Testing results.

4. Health and Safety reports.

5. Copies of permits.

E. Utility Relocation

1. Submit written confirmation from the utility providers that all temporary relocated utilities have been restored to pre-remediation condition, and that all temporary utility connection points have been restored to a suitable condition.

F. Permit Closeout

1. Submit written confirmation that all permits have been closed with their governing authority and that any and all remaining fees have been paid in full.

G. Final Acceptance

1. Submit written certification that confirms the following: Contract Documents have been reviewed, Work has been inspected, Work is complete in accordance with the Contract Documents (including satisfactory compliance with performance guarantees), any previously noted deficiencies have been corrected

or remediated, equipment has been tested in the presence of the Engineer/CM, and that the Work is complete and ready for final inspection.

2. Submit evidence of final continuing insurance coverage, complying with insurance requirements, with the application for final payment. The Contractor is required to name National Grid as additional insured.

3. The Engineer/CM will inspect the Work to verify status of completion.

4. Should the Engineer/CM find the Work to be satisfactory, the Contractor will be allowed to make application for final payment in accordance with the Contract. Should the Engineer/CM find deficiencies and incomplete Work, the Contractor will be notified in writing of deficient and/or incomplete Work and requests for final payment will not be approved until such time that the Contractor has satisfactorily completed the required Work.

5. Take immediate action to remedy incomplete/deficient Work and send written notice to the Engineer/CM upon completion. The Engineer/CM will then re-inspect Work to verify the status of completion.

H. Final Payment

1. Submit an application for final payment after the final acceptance of the Work.

2. Submit evidence of final continuing insurance coverage, complying with insurance requirements, with the application for final payment.

3. Identify total Contract amount, previous payments and the amount due.

4. Submit an application for payment of retainage accompanied by signed affidavits verifying the release of liens and payment of all debts and claims.

PART 2 MATERIALS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 77 00

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment and performing all operations required for the partial or complete removal of structures, at grade, above grade, and below grade during the performance of the Work.

1.02 GENERAL

A. The use of explosives to demolish below grade structures or portions of below grade structures as part of this Project, is not permitted.

B. The Contractor may propose to demolish the slab in any logical order (e.g., in sections) if the methodology and phasing submitted with the Site Operations Plan are acceptable to the Engineer/Construction Manager (CM).

C. Consult the drawings for the extent of all demolition Work required and remove all indicated materials, finishes, and other items indicated thereon to be removed.

1.03 SUBMITTALS

A. Submit a demolition plan as part of the Site Operations Plan for review and approval indicating the proposed methods and sequence of operations for the selective removals and demolition Work, prior to commencement of operations. The sequence of operations shall be planned, in detail, to ensure safety of the workers during demolition.

B. Submit a monitoring well decommissioning plan, including selected decommissioning method(s), drilling method(s) and proposed grout mix. Provide a minimum of 28 calendar days for submittal review, as this submittal will require review by the Engineer/CM and the NYSDEC.

PART 2 MATERIALS

2.01 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

A. Provide CLSM meeting the requirements of NYSDOT Standard Specifications Section 733-01.

B. This material may also be referred to as flowable fill.

2.02 NON-SHRINK GROUT

A. Provide non-shrink grout meeting the requirements of NYSDOT Standard Specifications Section 701-04 or 701-10.

2.03 CEMENT-BENTONITE GROUT

A. Provide cement-bentonite grout for well decommissioning with the following mixture proportions and in accordance with the requirements provided in NYSDEC CP-43, Groundwater Monitoring Well Decommissioning Policy

1. 94 lbs. (1 bag) Type I/II Portland Cement
2. 3.9 lbs. powdered bentonite
3. 7.8 gallons potable water

2.04 BRICK

A. Provide bricks to aid in the abandonment of structures and pipes conforming to NYSDOT Standard Specifications Section 704-01 or 704-02.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide safeguards including warning signs, barricades, temporary fences, warning lights and other items as needed for the protection of all personnel during demolition and removal Work.

B. Protect the existing finish work that is to remain in place from damage.

3.02 GENERAL

A. Remove only the above grade structures indicated for demolition on the Contract Drawings. Use precautions to protect existing structures to remain and their finishes during demolition.

B. Remnant foundations to be demolished must be cut in neat lines at the excavation extents. The Contractor may not chase remnant foundation elements outside of the excavation extents. Cut and cap all pipes encountered at the excavation limits to the satisfaction of the Engineer/CM.

C. Do not pull on remnant foundation elements extending outside of the excavation extents, and do not use impact tools to break up remnant foundation elements until they have been sectioned off at the excavation extents.

D. Do not comingle waste streams unless they are intended for disposal at the same facility, and the comingling is acceptable to the facility without altering the disposal cost of the constituent components.

E. Do not use cutting torches until the work area is clear of flammable materials. Verify the condition and content of any hidden spaces before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

F. Maintain adequate ventilation when using cutting torches.

3.03 MATERIAL HANDLING

A. Store demolished materials on a debris pad, or in a container designed for the purpose.

B. Dispose of any debris in accordance with the Contract Documents.

C. The on-Site burning of materials is not permitted.

3.04 MONITORING WELL DECOMMISSIONING

A. All subsurface investigation activities are required to have Dig Safely New York (811) clearance and the upper 5 feet (minimum) advanced using soft dig, air knife, or vacuum excavation techniques to check for utilities or other subsurface features at each location before drilling commences.

B. Decommission existing monitoring wells in accordance with the requirements of NYSDEC CP-43 “Groundwater Monitoring Well Decommissioning Policy”.

C. Use conventional rotary drilling methods or rotary sonic drilling methods. Direct push methods are not permitted.

D. Work to be performed by a qualified and licensed drilling and well decommissioning subcontractor.

E. Perforate and/or grout the riser and grout the screen in place. If the riser cannot be perforated, or breaks during the work, overdrill the well and backfill the drill hole with grout.

F. Use tremie methods to place grout and continue grouting until grout return has the same consistency of freshly-mixed grout.

G. Provide full-time observation and coordinate with the drilling contractor during the field work. Prepare a letter report documenting the field observations, decommissioning process, all required forms in CP-43, any changes or unexpected issues, details of grout or other materials (mix design, volume, etc.) used for the decommissioning and a photo log documenting the process.

3.05 ABANDONING PIPES

A. Provide temporary shoring in accordance with all federal and state requirements to safely support the existing soils and provide a supported area sufficient to execute the work.

B. Use temporary plugs as necessary to block the flow of water in the existing infrastructure. Dewater existing structures as necessary to complete the work.

C. Provide localized dewatering to maintain a dry and stable subgrade and to prevent groundwater or other water from impacting the abandonment work and/or curing of cementitious materials. Treat and dispose of dewatering effluent in accordance with the Contract Documents.

D. Plug existing pipes with bricks and non-shrink grout a minimum of 2 courses thick. Alternate abandonment methods and/or capping procedures may be used if approved in writing by the Engineer/CM and City of Schenectady.

E. Stockpile excavated material and debris for off-Site disposal.

F. Remove the temporary shoring and backfill the excavation with compacted imported granular fill to the approximate existing grades or proposed subgrade elevation.

3.06 ABANDONING THE HISTORIC MANHOLE

A. After the conclusion of the excavation and backfilling Work, fill the historic manhole structure with CLSM to within 1 foot of the final site restoration grade.

B. Abandon/plug pipes as described in the Contract Documents prior to filling the historic manhole.

C. Allow the CLSM to gain initial strength, and then demolish the historic manhole structure to a depth of 1 foot below the final site restoration grade.

3.07 CLEANUP

A. Remove all debris, residuals, and materials at the conclusion of demolition activities.

END OF SECTION 02 41 19

SECTION 02 61 00

REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the proper management, off-Site transportation, and disposal of waste materials and waste liquids generated during implementation of the Remedial Action (RA).

1.02 GENERAL

A. Identify a National Grid-approved disposal facility from the list of approved facilities provided with the Contract Documents for each anticipated waste stream. Submit the names of the disposal facilities proposed for use on the list of Subcontractors furnished with Contractor's Bid.

B. Furnish any additional analytical testing required by the disposal facilities to accept the material.

1.03 SUBMITTALS

A. Develop a Pre-Characterization Program Execution Plan describing the drilling and sampling methods, analytical testing laboratory and methods, volume calculations, and proposed excavation/disposal sequence.

B. Submit tabulated analytical data and raw data sheets along with the transmittals, permits and all other correspondence required for disposal facility approval.

C. Designate and submit primary and alternate disposal facilities for each anticipated waste stream. Upon final approval from National Grid, contract with all primary facilities prior to any excavation. Submit copies of contracts from each facility or letters from each facility-indicating acceptance of the total estimated volume of material from the Project.

D. Submit copies of all waste manifests, bills of lading, and certified weight slips from a scale approved for use by the Engineer/Construction Manager (CM) and/or National Grid for all materials removed from the Site for disposal.

E. Submit copies of Part 364 Permits for all waste transporters.

PART 2 MATERIALS

2.01 VEHICLE REQUIREMENTS

A. The license plates on the truck must be properly affixed and visible at all times.

B. Proper placards must be displayed and extraneous or incorrect placards must be covered and/or removed prior to the truck departing the Site.

C. All required permits must be properly displayed or readily available for verification by the Engineer/CM.

D. Drivers must remain in the truck at all times unless they are wearing the correct personal protective equipment required for the Site.

E. Standing on the back of the truck is prohibited. Ladders or scaffolding must be used when securing tarps and/or covers.

F. Provide polyethylene impermeable liners for the interior of the excavated impacted material storage containers and vehicles to prevent the leakage of entrained liquid. The liner material must be strong enough to withstand the placement of excavated material into the container without tearing, chemically resistant to the contaminants within the material, and be of sufficient length and width to cover the interior bed of the haul truck with no seams while completely covering over the load with overlap.

G. Provide vehicles and containers used for the storage and/or transport of materials with solid and sealable covers to minimize the release of odors from the containers during transport. The use of mesh covers is not permitted.

H. The Engineer/CM reserves the right to reject vehicles that are not properly equipped and/or arrive to the Site in a dirty condition.

2.02 ODOR SUPPRESSANT

A. Provide odor and dust suppressing foam to supplement covers, as requested by the Engineer/CM.

PART 3 EXECUTION

3.01 PRE-CHARACTERIZATION PROGRAM

A. Prior to commencing the field activities, develop and submit a Pre-Characterization Program Execution Plan and proposed exploration plan (figure) to the Engineer/CM.

B. Calculate volumes/tonnage for each disposal facility.

C. Plan, coordinate, and execute a comprehensive subsurface exploration and testing program to adequately characterize soils for off-Site disposal and maximize the quantity of soils that may be directly loaded.

D. Advance borings using conventional drilling methods. Actual drilling method to be determined by the Remedial Contractor and/or their drilling subcontractor, and should be sufficient to permit drill hole advancement and sample collection to the required depths.

E. Collect and contain all investigation-derived wastes in drums or other suitable containers. Stage these containers at a secure on-Site location for off-Site disposal during the remedial construction.

F. If test pits are used, stockpile soil on poly sheeting near the test pit and backfill the test pit with excavated material in the order it was removed.

G. Backfill all borings with cement-bentonite grout.

H. Develop a figure illustrating the as-built exploration locations and the associated grid system or other methods to correlate sample results with in-situ conditions, the proposed excavation sequence and associated volumes/tonnage.

I. Evaluate if stabilization measures or other in-situ or ex-situ treatment/handling will be required to avoid disposal facility surcharges and report the findings to the Engineer/CM in writing a minimum of 10 business days prior to commencing intrusive activities.

J. Prepare the necessary data tables, reports, and other correspondence to obtain facility approval prior to commencing intrusive activities.

K. Collect and analyze any confirmatory, documentation, or other samples that may be required to compare the data collected during the Pre-Characterization Program with excavated material being sent for off-Site disposal.

L. Perform all other activities to achieve and maintain disposal facility acceptance for all excavated material generated during the execution of the work, including decontamination spoils and wastes generated after intrusive activities and/or during demobilization activities.

3.02 LOADING AND TRANSPORTATION OF MATERIAL

A. Trucks must arrive on Site in a clean condition. The Engineer may instruct a truck to depart the Site if it arrives in a dirty condition.

B. Use pre-characterization sample results to allow direct load, transport, and disposal of all MGP-related impacted material whenever possible.

C. Provide traffic control at the Site entry to ensure a smooth flow of traffic and to minimize congestion at the Site entrance. At a minimum, the traffic control must include the usage of flaggers and proper signage.

D. Appropriately cover trucks filled with excavated material prior to exiting the Site to prevent vapor and fugitive dust emissions during transport. Supplement with odor suppressant foam or solvent as needed. Gross vehicle truck weights shall conform to the most current DOT regulations for the Federal, State, and local level.

E. All Work in and around trucks shall be performed in appropriate personal protective equipment. These activities must be specifically addressed in the Site-Specific Contractor HASP.

F. Prior to leaving the Site, inspect all material transport vehicles and containers for evidence of contamination (including inside of wheels and undercarriage). All trucks leaving the Site shall proceed to a decontamination station for cleaning prior to exiting onto public roads.

1. Brush off equipment using a broom and/or brushes within the excavation area prior to movement to the decontamination pads to decrease the amount of respirable particulates leaving the remediation area.

2. If necessary, at the decontamination pad, all heavy equipment will be pressure washed before leaving the Site.

3. All equipment leaving the Site will be decontaminated per these guidelines. In addition, any equipment previously used to excavate impacted material will be decontaminated prior to use in backfilling (e.g. excavator bucket).

4. Size decontamination pads to ensure that the largest piece of Contractor equipment can be adequately decontaminated. Provisions will be made to control overspray at the decontamination pads.

5. Collect and pump wastewater from equipment decontamination into the on-Site wastewater treatment system.

6. Excess wastewater is to be containerized and transported from the Site by a properly licensed liquid waste hauler, after the on-Site wastewater treatment system has been demobilized from the Site.

7. Soils collected from the decontamination pads will be bulked with the MGP-related impacted material and sent to the properly licensed National Grid-approved disposal facility, as necessary.

G. Trucks shall proceed directly to the designated disposal facility. Trucks may not be pre-loaded with material for overnight storage.

H. The Contractor is responsible for any and all actions necessary to remedy situations involving material spilled or leaked in transit, or mud or dirt tracked off Site. This includes trucks carrying imported fill or other materials to the Site (i.e., dust generated from trucks entering the Site on adjacent roads). Clean up shall be performed in accordance with all applicable Federal, State, and local regulations at no additional costs to National Grid. Public roads will be swept, as necessary, and/or at the direction of the Engineer/CM, to remove any material deposited on public streets resulting from traffic leaving the Site.

I. All transporters used shall be properly licensed, permitted, and certified for the service provided.

J. Material from the Site will not be combined with any other material, without the Engineer/CM's approval.

K. National Grid or the Engineer/CM will sign transport bills of lading or manifests. National Grid will provide a hazardous waste generator number, if required. Maintain copies of all documents involving transportation of materials from the Site. Copies of these records shall be submitted to the Engineer/CM at a frequency agreed to by the Contractor and National Grid. All records shall be turned over to National Grid at the completion of the Work.

L. Ensure that transport vehicles are properly secured, labeled, and placarded prior to exiting the Site.

3.03 DISPOSAL OF MATERIALS

A. Dispose of soils that contain MGP-related impacted material at an off-Site licensed disposal facility approved by National Grid, unless otherwise specified.

B. Dispose of Construction & Demolition debris at a licensed, off-Site facility approved by National Grid, unless otherwise specified.

C. The Contractor is responsible for the acceptance of materials at the facilities. This includes furnishing any additional laboratory analysis required by the facilities for acceptance of the material. In the event that the identified and approved facilities cease to accept the materials, the Contractor will be responsible for identifying alternate facilities, and making arrangements with such facilities to accept material from the Site with no change in the unit price submitted in the Contractor's Bid for this Project. Alternate facilities are subject to review and approval by National Grid.

D. In the event that an alternate facility is needed to accept the material, the Contractor will supply a written submission to National Grid on the material type, amount, location, and reason the approved facility ceased to accept the material. Alternate facilities not previously audited by National Grid will require an audit prior to allowing transport of materials to the facility. Any charges or fees incurred by the Contractor associated with delays to the Project schedule during this audit process are the responsibility of the Contractor.

E. If any materials are encountered during excavation that appear to exhibit hazardous characteristics, where hazardous material was not expected to be encountered, these materials should be segregated, stored on Site, sampled, and disposed of appropriately.

F. Decontaminate construction debris and/or bulky material within the excavation, if encountered, if possible.

G. Segregate non-contaminated construction debris and bulky wastes for transport to a landfill facility.

H. Dispose of any decontamination wastewater generated after the demobilization of the on-Site wastewater treatment system at an off-Site liquid waste treatment facility approved by National Grid. Provide any additional laboratory analysis required to dispose of the wastewater generated during the performance of the Work.

I. Solid material collected in the treatment system tanks, as a result of settling in the tank, shall be bulked with the suspected MGP-related impacted material and sent to the disposal facility, as necessary.

END OF SECTION 02 61 00

SECTION 31 09 00

INSTRUMENTATION

PART 1 GENERAL

1.01 SUMMARY

A. The Contractor will implement the optical monitoring program, as shown and described in the Contract Documents, during the performance of the Work.

B. The Engineer/Construction Manager (CM) will oversee a geotechnical instrumentation program consisting of vibration and crack gauge monitoring during the performance of the Work.

1.02 SUBMITTALS

A. Submit the results of all geotechnical monitoring performed by the Contractor during the Work as part of the Daily Report.

PART 2 MATERIALS

2.01 OPTICAL MONITORING POINTS

A. Furnish and install optical monitoring points (OMPs) consisting of refractive lenses at the locations shown on the Contract Drawings that are sited on the excavation support system.

2.02 VIBRATION MONITORS

A. The Engineer/CM will furnish four Minimate Plus vibration monitors with geophone attachments from Instantel, or equivalent, for use during the performance of the Work.

PART 3 EXECUTION

3.01 PROTECTION

A. Protect all instruments (regardless of who furnished and installed) from damage due to construction operations, weather, traffic, and vandalism.

B. The Contractor is liable for all costs associated with the replacement of geotechnical instruments that are damaged as a direct result of their actions or the actions of their Subcontractors.

3.02 VIBRATION LIMITS

A. Conduct all Work in such a manner that vibrations caused by the Work do not damage nearby structures.

B. Do not allow vibration levels at nearby structures to exceed the guidance criteria set forth by the USBM RI 8057, excerpted in the table below.

Frequency, Hz	Maximum Safe Particle Velocity value (in/s)
1, 2, 3, 4	0.18, 0.36, 0.54, 0.75
4 – 14	0.75
14, 20, 30, 40	0.75, 1.0, 1.4, 2.0
40 – 100	2.0

C. The guidance provided in the USBM maximum safe particle velocity values table does not relieve the Contractor from responsibility with regard to fulfillment of the terms of the Contract and the requirement to protect the existing structures and restore or replace damage caused either directly or indirectly during the performance of the Work.

D. The Engineer/CM may instruct the Contractor to implement vibration reduction strategies in order to mitigate vibration levels which exceed the USBM criteria during the performance of the Work.

E. Requests for an increase in time or relevant pay items related to the implementation of any vibration reduction strategies needed to meet the requirements of this Section will be denied.

F. The Engineer/CM will place vibration monitors adjacent to the following nearby structures during the performance of the Work

1. Railroad tracks.
2. Retaining wall.
3. Existing Gas Main in Van Guysling Ave.
4. Office building.

3.03 MOVEMENT MONITORING

A. Perform vertical and lateral movement monitoring using the OMPs and a total station.

B. Monitor both horizontal and vertical movement of the OMPs.

C. Tolerances

1. Determine the initial location of each monitoring point with respect to a benchmark(s) identified in the Contractors SOP.
2. Determine the location of monitoring points to an accuracy of plus/minus 0.01 feet in the horizontal and vertical direction.
3. Alter the means and methods of the Work if movement exceeding 0.25 inch is measured, unless otherwise approved by the Engineer/CM. The maximum allowable cumulative vertical or horizontal movement measured at any OMP is no more than 0.75-inches. Stop all related construction activities to prevent additional movement if the maximum allowable movement criterion is exceeded. These criteria may be adjusted by the Engineer/CM, at their sole discretion, based on actual conditions experienced on Site.

3.04 DATA ACQUISITION

A. The recording of vibration data will be performed by the Engineer/CM.

B. Provide safe access to all Engineer/CM controlled instrumentation equipment located on Site.

C. The licensed independent surveying Subcontractor retained by the Contractor must also collect and interpret all OMP data collected during the performance of the Work.

D. Immediately following installation of the OMPs, take an initial reading to provide baseline data points and to demonstrate the adequacy of the completed installation. Perform baseline readings prior to the start of any excavation Work.

E. At a minimum, daily monitoring will be required for all OMPs during the soil excavation and backfill Work.

F. Automated data collection systems, installed and monitored under the guidance of a Professional Engineer or Professional Land Surveyor registered in New York State will be permitted.

G. Within 24 hours of each survey, submit to the Engineer/CM the latest survey elevations and coordinates at each monitoring point along with all previous survey information as part of the Daily Report with a summary of movements noted in the x, y, and z axis.

H. A web-based interface may also be used to display and distribute daily monitoring data.

END OF SECTION 31 09 00

SECTION 31 10 00

SITE PREPARATION

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment and performing all operations required for the Site preparation prior to performance of the Remedial Action (RA).

1.02 SUBMITTALS

A. Provide the Dig Safely New York ticket number(s) and the findings of the utility mark out to National Grid and the Engineer prior to excavation.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTIONS

3.01 GENERAL SITE PREPARATION ACTIVITIES

A. Clear all debris, rubble, and vegetation from the Work areas and in any other areas which will be used for construction support as approved by the Engineer.

1. The Engineer will identify any trees and/or existing vegetation that is designated to remain and to be protected.

B. Clear all debris, rubble, and vegetation from the air monitoring station locations as directed by the Engineer.

C. Provide protection for existing monuments, structures, and appurtenances during the Work.

D. Protect the air monitoring station locations during the Work.

E. Provide temporary relocation of appurtenances that have the potential to become damaged during performance of the Work.

3.02 TEMPORARY CONSTRUCTION ENTRANCE

A. Obtain the appropriate permits required for temporary construction entrances, if necessary.

B. Install the temporary construction entrance in accordance with any City of Schenectady, County, or State Department of Transportation requirements.

3.03 DEBRIS REMOVAL

A. Remove debris within the limits of Work area, and debris generated during excavation; handle, screen, and characterize as necessary.

B. Remove all debris (i.e., trash, metal, concrete, asphalt, etc.) within the Site boundary. Conduct all handling, segregating and screening activities that are necessary to facilitate off-Site disposal.

C. Contaminated materials must be segregated from non-contaminated materials and prepared, as necessary, for disposal at the facilities approved for use during performance of the RA.

D. Dispose of all debris at an approved disposal or recycling facility.

3.04 WORKING RESTRICTIONS - OVERHEAD ELECTRICAL UTILITIES

A. There are overhead electrical distribution and telecom lines near portions of the Site. Use extreme care during the implementation of the RA so as not to damage or interfere with these utilities.

B. Maintain the minimum OSHA or National Grid required setbacks, whichever is more stringent, for all booms and trucks operating in the vicinity of energized lines.

C. Coordinate with the electrical utility provider to de-energize or sheath overhead electrical lines, if required to complete the RA.

D. Do not load or empty trucks within the required setbacks under the overhead electrical utilities. Do not open truck covers within the required setbacks under the overhead electrical utilities. Provide warning signs of overhead lines and clearances for truck drivers at the Site entrance.

E. Provide ground level warning signs every 50 feet under overhead power lines within the work area.

3.05 SNOW REMOVAL

A. Perform all snow removal activities on Site during the duration of the Work, as needed for the successful completion of the Work.

B. Arrange for snow removal to be performed as soon as practicable after a snow event and minimize the amount of time lost due to inclement weather.

C. Remove/relocate snow to maintain emergency vehicle access and egress points on the Site at all times while the Work is being performed.

D. Remove snow from the sidewalks abutting the Site as part of the snow removal after a snowstorm.

END OF SECTION 31 10 00

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the excavation, handling, and backfilling of material during performance of the Remedial Action (RA).

1.02 SUBMITTALS

A. Excavation and Backfilling Plan: Submit an Excavation and Backfilling Plan showing sequencing, staging, and phasing of the excavation, materials handling and backfilling activities. Incorporate into Site Operations Plan (SOP) submittal described in the Contract Documents.

B. Borrow Source Evaluation: Submit the results of a borrow source evaluation for each source to be used for imported backfill indicating that the material is in compliance with the geotechnical and environmental criteria, including NYSDEC sampling requirements, analytes, and sampling frequency. Perform the borrow source evaluation prior to the import of fill from the borrow source. Include the following information as part of the submittal:

1. Name, address, telephone number, and website address of the borrow source.
2. Certificate of clean fill from the borrow location stating that the soil is native in origin and free of contamination.
3. Analytical results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is free of contamination and in compliance with the environmental criteria.
    a. The analytical results for all imported fill must demonstrate that the material meets the Commercial Soil Cleanup Objectives described in the requirements of 6NYCRR 375-6.8(b) and DER-10 5.4 and all current emerging contaminant testing requirements.
4. Geotechnical test results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is in compliance with the geotechnical criteria.

1.03 QUALITY CONTROL

A. Surveys

1. Contractor's Land Surveyor shall stake excavation boundaries indicated on the Drawings and perform initial survey as specified in the Contract Documents.
2. Contractor shall perform surveying to record elevations during the course of the excavation Work. During performance of the Work, Contractor shall employ all

equipment necessary for control of excavation depths, lines, and grades within required tolerances.

3. Verification of final excavation horizontal limits and depths shall be accomplished by survey provided by Contractor's Land Surveyor and in a manner that is mutually acceptable to the Contractor and the Engineer/CM. During the progress of Work, the Contractor shall provide survey data as the excavation progresses that consist of the following

   a. Horizontal limits of completed excavation in sufficient detail to define limits and calculate volumes of the material removed. All soil will be excavated from inside of the excavation support system to the design depth/elevation shown in the Contract Drawings.

   b. Vertical limits of completed excavation in sufficient detail to verify the progress of the completed Work.

   c. Location and depth of all confirmation samples.

4. Contractor personnel and equipment shall meet the training standards and requirements of OSHA 29 CFR 1926: Subpart P-Excavations.

1.04 PROJECT CONDITIONS

A. Excavation will occur in a commercial/residential neighborhood along Van Guysling Avenue. Odors, noise, dust, and vapors must be controlled accordingly and as described in the Contract Documents.

B. The upper 5 to 7 feet of soil in a portion of the remedial excavation boundary has been excavated and replaced as part of a prior remediation in 2016-2017. Stone cover and imported fill with a demarcation layer were used to backfill the prior excavation. However, debris and other urban fill materials will be encountered in the excavation area beyond the 2016-2017 project limits.

C. Excavation will be primarily in fill and alluvial soils, and groundwater will be encountered during excavation. Historical groundwater elevations at the project Site are shown on the Contract Drawings.

D. Contractor shall provide materials and install all necessary controls required for stability of the excavation and to protect adjacent roadways, railroad, utilities, and other subsurface structures.

E. Subsurface Utilities

1. Contractor shall locate existing wells and underground utilities in the areas of the Work including the City of Schenectady right-of-way (ROW) in Van Guysling Ave and Clinton Street Extension. If utilities are to remain in place, provide adequate means of protection during all operations.

2. If unidentified utilities are encountered during excavation, notify the Owner and Engineer/CM immediately.

3. Do not interrupt existing utilities except when permitted in writing by the Owner and then only after acceptable temporary utility services have been provided, tested, and approved.

F. Subsurface Information

1. Additional data on observed subsurface conditions, including soil boring logs, is included in the Remedial Action Work Plan (RAWP).

2. Data is provided for information only and is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater levels at dates and times other than the date and time when measured.

3. Owner and Engineer/CM will not be responsible for interpretations or conclusions drawn by Contractor. Data is solely made available for the convenience of Contractor.

4. Additional explorations may be performed by the Contractor, at no additional cost to the Owner.

G. Existing Structures

1. The Drawings illustrate certain surface and underground structures in the work area and utilities adjacent to the Work. This information has been obtained from existing records. It is not Guaranteed to be correct or complete.

H. If necessary, overhead utilities in the work area, shall be de-energized, adequately protected, or removed and replaced at the Contractor's expense according to the methods identified in the Contractor's SOP. All coordination, permitting and approvals are the responsibility of the Contractor.

1.05 EXCAVATION REQUIREMENTS

A. Comply with OSHA Regulations (Title 29 CFR Part 1926 Subpart 651)

1. These regulations include but are not limited to specific excavation requirements including the following

a. Removal of parking lot asphalt.

b. Determination of underground installations.

c. Providing access and egress.

d. Protection of nearby structures including the railroad embankment, retaining wall, and City ROW.

e. Preventing exposure to vehicular traffic.

f. Preventing exposure to falling loads.

g. Providing a warning system for mobile equipment.

h. Preventing exposures to hazardous atmospheres.

i. Preventing hazards associated with water accumulation.

j. Protection of employees from loose fill or soil.

k. Inspections.

2. The Contractor shall be responsible for meeting requirements for excavation protection in OSHA Title 29 CFR Part 1926 Subpart 652.

B. Contractor shall notify all utility companies and locate all underground utilities on Site and adjacent to the work area prior to starting excavation Work. Contractor shall be responsible for protection of utilities. If Contractor damages any utilities, Contractor shall repair or replace the damaged utility at Contractor's own expense without reimbursement.

C. Support of Excavation

1. Provide excavation support in accordance with the Contract Documents.

2. Provide temporary construction fencing, barriers to provide protection of equipment and personnel from the open excavation. Contractor shall provide methods and procedures in the Contractor HASP and SOP for safe work around the open excavation.

D. Post-excavation Documentation Sampling

1. When excavation of impacted material reaches the design depth and no visual impacts or source material is observed, the Contractor shall assist the Engineer/CM in collecting documentation samples from the excavation bottom.

2. Documentation samples are required at a minimum frequency of one sample per 900 square feet of excavation area.

3. Sidewall samples will not be collected due to the presence of the excavation support system.

4. The Contractor's surveyor shall survey the location and elevation of sample locations.

5. If additional excavation is required, the Engineer/CM will collect additional documentation samples and the Contractor's surveyor shall survey the new limits of excavation and sample locations. The same requirements for backfill authorization will apply as for the initial excavation/sampling.

1.06 CONSTRUCTION REQUIREMENTS

A. Sequence the excavation to meet the excavation support, excavation, and material handling requirements.

B. Locate excavation support and other engineering controls in accordance with the limits of excavation shown on the Drawings.

C. Coordinate the installation of excavation support and controls with the installation and operation of excavation dewatering systems.

D. Complete excavation, demolition of subsurface structures and backfilling in accordance with the requirements provided in the Contract Documents and the sequence/procedures described in the SOP.

E. Perform compaction and density testing of imported fill.

PART 2 PRODUCTS

2.01 GENERAL

A. The existing stone cover and imported fill from the previous remediation will be reused as backfill.

2.02 STABILIZATION AGENT

A. Provide a stabilization agent, such as cement kiln dust (CKD), or equivalent to amend soils too wet to transport in trucks, as directed by the Engineer/CM. The stabilization agent used must be acceptable to the disposal facility and in accordance with NYSDEC requirements for amendments. Submit the manufacturer SDS and product information for all amendments as part of the Contractor SOP prior to the material being imported to the Site.

2.03 DEMARCATION BARRIER

A. Furnish a demarcation barrier consisting of a non-woven, needled punched geotextile fabric for placement at the excavation subgrade.

2.04 WATER

A. Water for moisture conditioning or other on-Site use shall be free of hazardous or toxic contaminates, or contaminants deleterious to proper compaction.

B. Potable water from the municipal water system may be used with permission and the applicable permits from the City of Schenectady.

2.05 COMPACTION EQUIPMENT

A. Dedicated compaction equipment of suitable type, capable of achieving the specified requirements, and which provides a satisfactory uniform, homogeneous fill.

B. Hauling or placement equipment shall not be considered compaction equipment except under special circumstances as specified below.

C. Hand-operated Equipment

1. For use in confined areas not accessible to regular compaction equipment or where regular compaction equipment might damage structures or piping.

2. Subject to the approval of the Engineer/CM.

D. Type 1 Roller

1. Heavy-duty, self-propelled, steel drum vibratory roller.

2. At least 12,000 pounds static weight.

3. Vertical applied dynamic force: At least 4,000 pounds per foot of drum width when operated between 1,300 and 1,800 vibrations per minute.

4. Do not operate at speeds exceeding 3 miles per hour.

E. Type 2 Roller

1. Self-propelled, walk-behind or remote-controlled, steel drum vibratory roller.
2. Minimum static weight of 1,500 pounds.
3. Minimum dynamic force of 4,000 pounds.

F. Vibratory Plate Compactor

1. Minimum static weight of 270 pounds.
2. Minimum dynamic force of 1,000 pounds.

G. Additional compaction equipment may be used with approval of the Engineer/CM. Depending on the size/weight of the proposed equipment, loose lift thicknesses of the materials may be decreased accordingly.

2.06 BACKFILL

A. Testing Requirements

1. All backfill materials shall be chemically clean, in accordance with NYSDEC Title 6 NYCRR Part 375 Subpart 6.7 (d) values, as sampled and analyzed by the Contractor. Testing for Emerging Contaminants will be performed by the Engineer/CM as described below.
2. The Remedial Contractor will identify proposed sources of imported material and will be responsible for demonstrating that the imported material meets the requirements for Imported Granular Fill and is appropriate for use as backfill for the remedial excavation area.
3. The sampling quantities and analytes will be consistent with the requirements of Table 5.4(e)10 and Appendix 5 of NYSDEC DER10.
4. The results of the backfill analyses will be compared to the allowable constituent levels by the Engineer/CM. The Engineer/CM will submit the results to the NYSDEC for approval prior to importing the materials to the Site.
5. The facilities targeted by the Remedial Contractor will meet NYSEG and NYSDEC requirements.
6. Backfill materials shall meet the NYSDEC requirements for emerging contaminants.
7. The requirements of the NYSDEC may change from what is listed herein. The Contractor shall confirm the most current requirements of the NYSDEC for emerging contaminants prior to performing the analyses and importing any materials.

B. Imported Granular Fill

1. Furnish Imported Granular Fill that is a durable mixture of sand, gravel, and silt and shall be free from ice and snow, roots, sod, debris, rubbish, and any other deleterious or organic matter. It shall conform to the following gradation requirements:

Sieve Size	Percent Passing
3-inch	100
2-inch	90-100
1-inch	70-90
No.4	30-80
No. 200	0-15

2. Complete a Modified Proctor maximum density test via ASTM D1557-latest edition, and grain size analysis via ASTM D6913-latest edition for each sample collected.

3. Collect at least one sample per borrow source.

C. Gravel Base

1. Furnish Gravel Base that conforms to material designation NYSDOT 667-1.

2. Complete a Modified Proctor maximum density test via ASTM D1557-latest edition, and grain size analysis via ASTM D6913-latest edition for each sample collected.

3. Collect at least one sample per borrow source.

D. Crusher Run

1. Furnish Crusher Run that conformed to material designation NYSDOT 733-1, Type 4 Subbase.

2. Complete a Modified Proctor maximum density test via ASTM D1557-latest edition, and grain size analysis via ASTM D6913-latest edition for each sample of collected.

3. Collect at least one sample per borrow source.

E. Existing Imported Fill Material for On-Site Reuse

1. A PCB remediation was previously performed on Site by the City of Schenectady. A demarcation barrier was placed to separate imported fill material from the underlying MGP-impacted material.

2. Remove the existing imported fill material at the locations shown on the Contract Drawings from above the demarcation barrier and stockpile for reuse.

3. This class of material is does not require analytical testing to determine acceptability for reuse.

F. Aggregate Materials

1. Furnish No. 2 Crushed Stone conforming to NYSDOT Section 703-02

2. Furnish Bedding Material conforming to NYSDOT Section 733-23, Type 2 Gradation

3. Furnish Light Stone Fill conforming to NYSDOT Section 733-2102

G. Environmental Analysis Requirements

1. All analyses to be conducted by a laboratory that is appropriately licensed to perform the analysis in the State of New York. Forward analytical results to the Engineer/CM at least two weeks prior to the material being imported to the Site.

2. In addition to the chemical analysis required specific to the fill type and NYSDEC DER-10, Section 5.4 and Appendix 5, the Engineer/CM will also analyze each fill sample for emerging contaminant compounds. Contractor is responsible for coordinating with and assisting the Engineer/CM with the collection of these samples from each imported fill source. At the time of writing, the list of emerging contaminants includes

   a. 1, 4-dioxane - EPA Method 8270D

   b. PFAS – EPA 537 Modified:

      - Perfluorobutanesulfonic acid
      - Perfluorohexanesulfonic acid
      - Perfluoroheptanesulfonic acid
      - Perfluorooctanessulfonic acid
      - Perfluorodecanesulfonic acid
      - Perfluorobutanoic acid
      - Perfluoropentanoic acid
      - Perfluorohexanoic acid
      - Perfluoroheptanoic acid
      - Perfluorooctanoic acid
      - Perfluorononanoic acid
      - Perfluorodecanoic acid
      - Perfluoroundecanoic acid
      - Perfluorododecanoic acid
      - Perfluorotridecanoic acid
      - Perfluorotetradecanoic acid
      - 6:2 Fluorotelomer sulfonate
      - 8:2 Fluorotelomer sulfonate
      - Perfluroroctanesulfonamide
      - N-methyl perfluorooctanesulfonamidoacetic acid
      - N-ethyl perfluorooctanesulfonamidoacetic acid

PART 3 EXECUTION

3.01 PREPARATION

A. Layout the overall excavation area, the sheet pile locations, and the extents of the new storm drain alignment.

B. Install and operate the excavation support and dewatering systems prior to beginning bulk excavation.

C. Implement airborne dust and vapor suppression measures required to comply with the CAMP and as directed by the Owner and the Engineer/CM. These actions may include any of the following, or other appropriate measures, to minimize air emissions

1. Applying water on exposed soil surfaces and/or roadways to suppress dust.
2. Covering working areas of exposed soils or stockpiles with tarpaulins, vapor suppressing foam, or other vapor controls.
3. Modifying the means and methods of the Work (i.e. using different or additional equipment, etc.).
4. Changing the sequence of activities.

3.02 GENERAL

A. Excavate soil, fill, and debris to the limits of excavation shown on the Drawings.

B. Dewater the excavation to provide a dry and stable excavation. Maintain water levels a minimum of 2 feet below the bottom of excavation or fill at all times.

C. The Contractor will not be compensated for unauthorized excavations or for transportation and disposal of soil generated from unauthorized excavations. Additionally, these shall be restored to the existing grade with compacted backfill at the Contractor's expense.

1. Unauthorized excavation is defined as: all excavation outside the lines and grades shown, and which is not approved by the Engineer/CM.

D. Keep placement surfaces free of ponded water, debris, and foreign material during placement and compaction of fill and backfill materials.

E. Prior to placing backfill materials, the bottom of excavation and the excavation support system shall be inspected the Engineer/CM. A 48-hour advance notice shall be provided to the Engineer/CM prior to commencing placement of backfill materials to permit inspection and testing.

F. All operations including, but not limited to, loading, transporting, dumping, spreading, moisture conditioning and compacting materials shall be conducted in a manner to prevent contamination, segregation of embankment zones, or breakdown of particles. All contaminated or segregated materials shall be removed and replaced by the Contractor at no additional cost to the Owner. The distribution of materials throughout a zone shall be such that each lift is free from lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material.

3.03 CAMP REQUIREMENTS

A. Implement airborne dust and vapor suppression measures required to comply with the CAMP and as directed by National Grid or the Engineer/CM. These actions may include any of the following, or other appropriate measures, to minimize air emissions

1. Applying water on exposed soil surfaces and/or roadways to suppress dust.
2. Covering working areas of exposed soils or stockpiles with tarpaulins, vapor suppressing foam, or other vapor controls.
3. Modifying the means and methods of the Work (i.e. using different or additional equipment, etc.).
4. Modifying the production rate (i.e. excavation rate, etc.).

B. Changing the sequence of activities.

3.04 EXCAVATION

A. Perform excavations in accordance with OSHA regulations.

B. Remove the existing gravel surface cover and stockpile for reuse.

C. Install new storm drain and associated temporary shoring.

D. Layout and install the excavation support system.

E. Remove the existing gravel surface cover imported fill material from above the demarcation barrier at the locations shown on the Contract Drawings and stockpile for reuse.

F. Dewater the excavation as necessary to remove excess water during the excavation Work.

G. Perform the excavation to the lines and grades indicated on the Contract Drawings, and as directed by the Engineer/CM.

H. Perform the excavation Work in such a way as to avoid cross contamination of non-impacted materials with MGP-impacted materials (e.g. reduced excavation rates, decontaminating the excavation bucket, etc.).

I. Manage excavated materials in accordance with the Contract Documents. Excavated material handling includes

1. Excavate subsurface soil and incidental remnant structures such as manholes and piping to contours, elevations, and dimensions indicated.
2. Whenever possible, perform the excavation of impacted material as a direct- load operation or stockpile on Site the soil approved for reuse.
3. Transport and dispose of excavated material at a regulated, licensed, and National Grid-approved disposal facility or hazardous material facility, as directed by the Engineer/CM.
4. Segregate bulk solid waste and construction debris encountered during excavation from excavated soil to allow for acceptable disposal of soil at the disposal facility or hazardous material facility.

5. Gravity dewater excavated soil within lined stockpile areas and pump collected liquids into the on-Site wastewater treatment system for treatment and discharge.

J. Perform all excavations using proper shoring and bracing and/or excavation sloping/benching to ensure slope stability.

K. Use stabilization only for soils that are inherently too wet and cannot be dried sufficiently using other techniques. Stabilization may only be used with the approval of the Engineer/CM.

3.05 BACKFILL

A. Place the demarcation barrier at the bottom of the excavation grade. Lap all edges of the demarcation barrier a minimum of 12-inches. The placement of the demarcation barrier must be observed and accepted by the Engineer/CM prior to the placement of any fill material over the barrier.

B. For Gravel Surfaced Areas

1. Place and compact the in-situ soils that have been stockpiled for on-Site reuse into the excavation as backfill. Use available non-impacted material that has been stockpiled on Site before placing Imported Granular Fill. Do not place material that has been stockpiled for on-Site reuse within 2-feet of the final finished restoration grade for the Site.

2. Place and compact the Imported Granular Fill.

3. Place the Gravel Base and Crusher Run as shown on the Contract Drawings.

C. For Paved Areas

1. Backfill areas that will be restored with asphalt surfaces similarly to gravel surfaced areas leaving sufficient room for the asphalt binder and top courses.

D. Do not place backfill without the approval of the Engineer/CM. Placement of backfill prior to Engineer/CM approval is at the Contractor's risk and may require removal at the Contractor's cost. Commence backfill placement and compaction upon confirmation of the horizontal and vertical limits of the excavation; whichever is applicable, and as directed by the Engineer/CM.

E. Dewater the excavation as necessary to remove excess water during backfilling operations and to prevent a surface release of groundwater. Ensure that groundwater within the excavation does not overtop the excavation support system or excavation walls during backfill operations. Dewatering the excavation from localized sumps.

F. Backfill excavations to the lines and grades shown on the Contract Drawings.

G. Place backfill using a method that does not cross contaminate backfill, or disturb/damage adjacent structures and property.

H. Do not place backfill on areas consisting of soft and yielding material. Do not place fill or backfill if fill or backfill material is frozen, covered with snow, or if surface upon which fill or backfill is to be placed is frozen, saturated or submerged.

I. Provided neither the fill materials nor surface upon which the fill is to be placed is unfrozen, do not place fill when the air temperature is below +25° F. If the air

temperature is above +25° F, but below +32° F, fill can be placed as long as the average daytime temperature exceeds +35° F.

J. When the weather is such as to endanger the quality of the fill placement, the placement of material shall be halted until weather conditions are satisfactory. Fill shall not be placed during heavy rains or during falling snow. Any previously compacted material, which has become too wet or in any way unsuitable, as determined by the Engineer/CM, shall be removed, and replaced with new fill material.

K. Place and compact backfill in maximum 12-inch loose lifts.

L. Compact each lift at the specified moisture content, using the specified equipment, and to specified densities, prior to placing succeeding lifts. When the test results indicate that compaction water content or relative compaction is not in conformance with the specified limits, immediate adjustments in procedures shall be made by the Contractor as necessary to conform to the specified limits. Re-working to attain the specified limits may include reconditioning, re-rolling, re-handling, removal, or combinations of these procedures.

1. Perform moisture conditioning of fill materials as necessary prior to placement. Maintain moisture content of delivered materials and compact materials in the lift to produce the specified fill characteristics.

2. Provide supplemental sprinkling on the fill to keep material within specified moisture content limits throughout the placement and compaction process, and to preserve moisture in completed courses until placement of overlying courses.

3. Blend or process material to maintain uniform moisture content throughout the lift.

4. Do not attempt to compact material that contains excessive moisture. Remove or aerate material that becomes too wet.

5. Provide suitable types and numbers of watering and blending equipment to keep pace with fill and backfill placement activities. Provide additional equipment or restrict material placement rates if watering and blending equipment cannot keep pace with fill and backfill placement.

6. Maintain moisture conditions of the fill surface during nights, weekends, holidays, and other periods of temporary work stoppage.

M. Compact all material by mechanical means

1. Terminate material placement and take corrective action prior to resuming material placement if

   a. Tests indicate that compaction or moisture content is not as specified, or

   b. Compaction equipment being used is not as specified.

2. Operate compaction equipment in strict accordance with manufacturer's instructions and recommendations. Maintain equipment to deliver the manufacturer's rated compaction effort.

3. Where a minimum number of coverages is specified, provide a minimum of 20 percent overlap on adjacent passes.

4. Provide suitable numbers of equipment to keep pace with backfill placement activities. Restrict material placement rates if compaction equipment cannot keep pace with fill and backfill placement.

5. Heavy hauling or self-propelled compaction equipment shall not be operated within five (5) feet of the excavation support structure. Special compaction in this area shall be performed by the methods and to the requirements for compaction in restricted areas for each material type.

N. Granular Fill

1. Granular Fill materials shall be dumped and spread in level, continuous, approximately horizontal lifts that do not exceed 12 inches in thickness before compaction.

2. Water shall be added to Granular Fill materials as needed to facilitate compaction and achieve a water content -2% to 2% of optimum.

3. Each lift of Granular Fill shall be compacted by a minimum of four (4) passes of an approved self-propelled compactor or other equipment approved by the Engineer/CM.

O. Sub-Base Material

1. Sub-Base materials (gravel base and crusher run) shall be dumped and spread in level, continuous, approximately horizontal lifts that do not exceed 12 inches in thickness before compaction.

2. Water shall be added to Sub-Base materials as needed to facilitate compaction and achieve a water content -2% to 2% of optimum.

3. Each lift of Sub-Base Material shall be compacted by a minimum of four passes of an approved self-propelled compactor or other equipment approved by the Engineer/CM.

4. Compact Sub-Base material to a minimum of 95% of the Maximum Dry Density per ASTM D1557 (Modified Proctor).

3.06 TOLERANCES

A. Final Lines and Grades

1. Within 0.1 foot unless dimensions or grades are shown or specified otherwise.

3.07 QUALITY CONTROL

A. The Contractor shall perform all required Quality Control testing and analysis, including laboratory and field geotechnical testing.

B. Place and compact the backfill materials to the percent of the maximum dry density (as determined by Modified Proctor during the borrow source evaluation) indicated in the table. Do not place overlying lifts of backfill until in place compaction tests indicate that the current grade layer has been compacted in accordance with this criterion.

Project Area	Percent Compaction (%)	Test Frequency (per lift of material)
Less than 4 feet below finished grade.	95	50 ft by 50 ft
Greater than 4 feet below finished grade.	92	50 ft by 50 ft

C. Use an appropriately licensed testing Subcontractor that is certified to test soil by ASTM D6938-latest edition, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods-Shallow Depth.

D. If compaction testing indicates that the Work does not meet the specified requirements, provide additional compaction or remove the soil and replace with acceptable backfill.

E. The Engineer/CM reserves the right to reject backfill that differs visually from the identified source material and to randomly test backfill materials for conformance with the Contract Documents. Remove backfill that fails to meet the requirements.

F. Laboratory Testing of backfill materials (by the Contractor's QC Firm)

1. Soil Classification (ASTM D2487) and Grain Size (ASTM D422): Minimum of one test for every 1,000 cubic yards of each earth material and at least one for each borrow source and each visible change in material, at the Engineer/CM's judgement.

2. Modified Proctor Moisture—Density Curve (ASTM D1557): Minimum of one test for every 1,000 cubic yards of each earth material and at least one for each borrow source and each visible change in material.

G. Field Testing of Backfill (by the Contractor's QC Firm)

1. In-Place Density (using ASTM D1556, D 2922, or D 2937) and Moisture Content (using ASTM D 3017): One test for every 2,500 square feet per lift.

H. Verification of the vertical limits of fill placement shall be based on determination by the Engineer/CM and shall be verified by survey provided by Contractor's Land Surveyor.

I. The Contractor shall perform all required laboratory chemical testing.

J. If compaction testing indicates that the Work does not meet the specified requirements, provide additional compaction or remove the soil and replace with acceptable backfill.

K. The Engineer/CM reserves the right to reject backfill that differs visually from the identified source material and to randomly test backfill materials for conformance with the Contract Documents. Remove backfill that fails to meet these requirements.

3.08 LABORATORY CHEMICAL TESTING OF SOIL MATERIALS

A. The testing and acceptance requirements in this section shall apply to all imported soil materials as described in this Section or elsewhere in the Contract Documents.

B. The Contractor shall perform all required laboratory chemical testing at the frequency shown in the tables attached to this Section.

C. No laboratory chemical testing is required for soil or aggregate materials that meet the following requirements

1. Comes from a quarry permitted in the State of New York.
2. Has a grain size distribution with less than 10% passing the #80 sieve.

D. Chemical analytical analyses shall comply with the applicable SCOs.

E. The appropriate number of analytical samples shall be based on the estimated quantity of each import material and the sampling requirements provided in Table 5.4(e)10 of NYSDEC DER10.

F. The analytical requirements for Imported Fill Materials are:

1. **Composite Samples** – Composite samples of the imported materials will be analyzed for all parameters except VOCs.
2. **Discrete Samples** – Discreet/grab samples of imported materials will be analyzed for VOC TCL – EPA Method 5035A/8260C.
3. No compositing of the soil for the VOC analyses will be allowed.
4. The samples will be analyzed by a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. The chain-of-custody record for the sampling and the laboratory data packages, and the Data Usability Summary Reports (DUSRs) will be submitted to the NYSDEC for review prior to the import of the fill soil. The results will also be included in the Final Engineering Report (FER).

3.09 SITE RESTORATION

A. Contractor shall grade backfilled areas to the depth indicated on the Drawings.

B. Grade and compact sub-base as required for asphalt pavement installation.

C. Perform laboratory (disposal analytical samples) and field geotechnical (compaction) testing.

3.10 CONSTRUCTION METHODS

A. Establish excavation rates that will permit continuous Work while accommodating the receiving capacity of the selected treatment/disposal facilities.

B. Perform the excavation as a direct-load operation when practicable.

C. Divert or otherwise prevent surface water from entering excavations to the extent practicable without causing damage or flooding to adjacent properties.

END OF SECTION 31 23 00

SECTION 31 23 19

DEWATERING

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the dewatering of the excavation area during performance of the Removal Action (RA).

B. Dewatering system design and overall means and methods are the responsibility of the Contractor. The dewatering system is also required to provide a means of on-Site storage as well as conveyance to the water treatment system.

1.02 SEQUENCING AND SCHEDULING

A. Continuously dewater the excavation to minimize the water content of the excavated material and facilitate backfilling.

B. Coordinate and schedule the dewatering Work in a manner that minimizes the quantity of water pumped while not affecting the excavation and backfill schedule.

1.03 SUBMITTALS

A. Within 20 working days of receiving Notice-To-Proceed, submit to the Engineer/Construction Manager (CM) a written Dewatering Plan describing the plan to control groundwater and surface runoff during excavations, including the points of effluent discharge that will be used.

B. The Dewatering Plan shall be prepared by a Professional Engineer registered in New York State with relevant experience in similar system design and operation, and should include the following

1. Types and sizes of groundwater control systems to be used, including backup power and equipment.
2. Provisions for limiting siltation.
3. All calculations, if required, to demonstrate the effectiveness of the dewatering system.
4. Minimum, maximum, and peak dewatering flow rates.
5. Location plan showing recharge pits, discharge piping or channels, and all other discharge components.

C. Provide seepage and basal stability calculations based on the selected dewatering system. Calculations should illustrate that a sufficient factor of safety against basal heave exists during the work, that excessive exit gradients do not occur, and that the flow rate can be accommodated by the selected treatment system.

D. Include in the submittal drawings of the proposed dewatering system, calculations showing the basis for the sizing of equipment, and a monitoring program that will demonstrate compliance with these Specifications.

E. Submit all reports required by the regulatory agency that has issued the discharge permit and comply with any other requests for reports that may be required to maintain all permits necessary for dewatering in force during the duration of the Work.

F. Provide weekly Dewatering Logs summarizing the following minimum information

1. Volume of water, in gallons, pumped to the Water Treatment System (WTS) during that week. This value may be determined using totalizing flow meters.

2. Condition and maintenance of the dewatering system.

3. Rainfall measured at the Site.

4. Water levels within the excavation area.

1.04 DEWATERING SYSTEMS

A. Excavation Dewatering System

1. The Excavation Dewatering System shall include the following elements

a. Pumps.

b. Sumps and/or intermediate storage tanks constructed to prevent migration of sediment to the WTS.

2. The pumping system shall be capable of meeting the performance requirements described in this Section.

B. Restrictions

1. Limit lowering the groundwater table outside of the excavation to avoid movement or damage to existing utilities and other above- and below-grade infrastructure.

PART 2 PRODUCTS

2.01 DEWATERING EQUIPMENT

A. Furnish, install, and operate pumping equipment of sufficient capacities to meet the requirements for the removal of groundwater, stormwater, and surface runoff water from the excavation area as necessary to complete the excavation and backfilling Work.

B. Design dewatering system to support the maximum dewatering flow rates calculated during development of the Dewatering Plan.

C. Provide sound attenuated enclosures around all pumps, generators, and similar equipment to maintain the noise levels at or below 70 dBA at 30 feet.

D. Furnish and maintain a secondary containment system for the on-Site wastewater treatment system that has adequate capacity to hold 1 batch volume of water while the system is being operated.

E. Keep on Site or have immediate access to additional pumps, system components, backup power and spare parts of sufficient capacity to maintain dewatering activities during any pump breakdown, maintenance, or in case of flooding.

F. The excavation dewatering network should have redundant features such as adequate standby pumping capacity, valves, and piping so that damage to, or failure of, a principal component of the network will not result in the failure of the entire network.

G. Provide sufficient suction and discharge hose or piping for transferring pumped liquids without causing erosion, sedimentation, or other adverse consequences.

H. Provide freeze protection for all dewatering hoses, piping, and pumping equipment necessary to execute the Work throughout the winter months, including but not limited to insulation, heat wraps, heaters, and/or enclosures. Freeze protection chemicals or solutions shall not be used on Site without prior approval by the Engineer/CM.

I. Equipment for dewatering may be new or used but shall be suitable for the Work and maintained in good condition.

J. All dewatering equipment shall remain the property of the Contractor or Subcontractor.

K. Decontaminate dewatering equipment in accordance with the Contract Documents and remove the equipment from the Site at the completion of the Work.

PART 3 EXECUTION

3.01 DEWATERING - GENERAL

A. Design, furnish, install, operate, and remove a dewatering network to allow excavation to the depths shown on the Contract Drawings. The network should be designed to keep groundwater levels at least 2 feet below active excavation activities while minimizing the amount of water discharged.

B. Review the available sub-surface and geotechnical information to determine the pumping rates and storage requirements that will be required to complete the Work.

C. Furnish, at a minimum, all labor, materials, and equipment required to perform all operations required to design, install, test, pump, measure, and maintain the excavation dewatering equipment and water storage systems, including the storage tank, pumps, sumps, electric power supply, and distribution equipment as required to dewater the excavations so that the Work can be conducted under controlled conditions. Decontaminate and demobilize all dewatering equipment and materials after completing the excavation and backfill Work.

D. Install, operate, and remove the dewatering systems in accordance with applicable Federal, State, and local Laws and Regulations, permits, and generally accepted industry practices.

E. Repair or replace damaged pumps, piping, hoses, tanks, and all other dewatering equipment and materials immediately, if damaged. Damage includes any pump and power failures, leaks, breaks, clogs, or other conditions that adversely affect the dewatering system or releases contaminated water.

F. Grade the excavation area using run-on/runoff controls including, but not limited to, slopes, berms, and sumps to channel surface water runoff away from the excavation areas.

G. Prevent any impacted water from contacting soils, or water outside of the active excavation area. If environmental contamination results from the Contractor's failure to control impacted water, remove the contamination to the satisfaction of the Engineer/CM, at no additional cost to National Grid.

H. Install and maintain temporary trenches, pumps, drain pipes, sumps, wells, and other equipment to keep all excavations dry. Collect and remove all groundwater, seepage and surface runoff.

I. Provide filters for all pumps to prevent silt and fine sand from being pumped with the water.

J. Treat and dispose of dewatering discharge in accordance with the Basic Dewatering Plan approved by the Engineer/CM.

K. Dewatering discharge shall be conducted and disposed of in a manner that will not result in interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures, utilities, and the environment.

L. Do not discharge effluent from trench dewatering, including discharged groundwater and surface runoff which has entered the excavations, into surface water, storm sewers, or combined sewers.

M. Do not place fill, place concrete, or install piping and appurtenances in excavations containing standing water. Keep utility trenches free from water until pipe joint material has hardened. Protect newly made and existing concrete and masonry from damage resulting from dewatering Work by the use of canvas, tar paper, or by such other sufficient method approved by the Engineer/CM.

N. After the excavation is completed and inspected by the Engineer/CM, backfilling may proceed with the water levels maintained at least 2 feet below the backfill level until final grades are achieved.

O. At the completion of work, remove all dewatering equipment and backfill/abandon any remaining components with cementitious grout.

END OF SECTION 31 23 19

SECTION 31 41 00

SHORING

PART 1 GENERAL

1.01 SUMMARY

A. Provide all labor, equipment, supplies, and materials to install, operate, maintain, and remove a temporary excavation support system in the locations indicated on the Contract Drawings.

B. The Contractor is responsible for the materials and methods of construction for the excavation support system, subject to the criteria provided in the Contract Documents.

C. Coordinate the installation of the excavation support system with the dewatering plan. Incorporate staging of the excavation support and dewatering equipment into the narrative of the Contractor means and methods included in the Site Operations Plan.

1.02 SUBMITTALS

A. If an alternate design will be proposed by the Contractor, a comprehensive design report must be submitted a minimum of 4 weeks prior to commencing mobilization of excavation support materials or equipment to the Site. The design report is required to be developed and approved by a Professional Engineer registered in New York State with a minimum of 10 years' experience designing similar systems. The design report should include, but not be limited to

1. Discussion of soil layering and estimated geotechnical properties.

2. A comprehensive calculation package showing all inputs, construction stages, and outputs, including

   a. Calculation of geotechnical properties and applied lateral loads using active or at-rest earth pressure coefficients.

   b. Application of a construction surcharge based on equipment to be used during the Work, but not less than 300 psf.

   c. A factor of safety of 1.5 applied to the computed passive resistance.

   d. If modeling software is used, all inputs, stages, and outputs to the model should be provided in an easy-to-follow format.

   e. Computation of stresses and forces and the associated selection of sheet pile and structural steel member sizes.

   f. Calculations for all connection details.

   g. Drawings showing sheet pile layout, typical sections and wall elevations, installation sequence, and all connection details and other pertinent details.

3. The design and installation of an alternate excavation support system must meet the following requirements

a. Maximum distance from grade to the first bracing level shall not exceed 7 feet.

b. Maximum cantilever height of 10 feet.

c. Maximum center to center spacing of bracing levels (vertical) of 15 feet.

d. Apparent pressure diagrams shall only be used for computation of brace loads.

B. Submit the Contractor's Sheet Pile Layout Plan for approval prior to purchasing any materials for the sheet pile wall.

C. Submit all details of chosen pile driving equipment for review.

D. Submit mill certificates for the steel sheet pile sections.

E. Submit shop test results of structural steel sections.

F. Submit daily and upon completion of the sheet pile installation

1. Driving records including lengths and final tip elevations of sheet piles.

2. Records of any gaps that occurred between sheet piles created during pile driving.

G. After installation of the excavation support system, submit a detailed as-built plan. Include steel member identification, size, location, length, top elevation, excavation level/stage, and any other pertinent data.

H. Submit an action plan for arresting any unforeseen movements which could damage nearby structures, utilities, roadways and other features. Include methods and time for implementation.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with the current standard of practice and manufacturers' recommendations.

B. Maintain one copy of the AISC Code of Standard Practice on Site.

1.04 CONTRACTOR QUALIFICATIONS

A. The Contractor performing the sheet pile installation Work must specialize in performing similar work. They must have a minimum of 3 years of documented experience satisfactory to the Owner. Replace rejected Subcontractor(s) at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 SHEET PILES

A. Straight, free of any defects, cutouts, corrosion, and interlock damage. Use only continuous hot-rolled sections with no splices. Provide handling holes at one end only.

B. ASTM A572 Grade 50, with a minimum section modulus of 45 in3 per foot of wall.

2.02 STRUCTURAL STEEL

1. Wide Flange Sections
2. ASTM A572, ASTM 913, or ASTM A992, Grade 50
3. Pipe Struts
4. Physical and chemical requirements, ASTM A572, Gr. 65
5. Manufacturing processes and tolerances, ASTM A252
6. Pipe should be manufactured using electric resistance welded or rolled and welded processes only. Spiralweld pipe is not acceptable.
7. Plates and Connected Parts
8. Stiffener Plates and other miscellaneous plates, ASTM A36
9. Plates for connecting pipe struts to wales, ASTM A572, Gr. 50
10. Use steel shims or wedges, wooden shims or wedges are not permitted.

2.03 WELDING

1. Utilize welding techniques and welding electrodes that are in accordance with AWS D1.1, Structural Welding Code, latest edition.

2.04 INSTALLATION EQUIPMENT

A. Size installation equipment to provide sufficient energy to install the excavation support system to the required depths.

B. The use of impact hammers on the Project is not permitted.

C. Size removal equipment to provide sufficient energy to remove the excavation support system.

PART 3 EXECUTION

3.01 GENERAL

A. Install the temporary excavation support system in order to excavate and backfill the excavation area shown in the Contract Drawings.

B. Install and maintain the excavation support system in a manner that prevents the following

1. Excessive movement and settlement.
2. Removal of soil fines from the adjacent ground.
3. Damage to or excessive movement of, nearby structures, utilities, roadways, and other features.
4. Cross and/or re-contamination from impacted materials.

3.02 EXCAVATION SUPPORT SYSTEM INSTALLATION

1. The Contractor may use any pile driving system, except for an impact hammer, to install the sheet pile barrier wall. If a vibratory driving system is used, a variable-moment hammer must be used.
2. Install sheet piles using a template, a Shop Drawing of which must be included in the Contractor SOP.
3. Install steel support members in a plumb position such that each pile installed is continuously interlocked with adjacent piles over its entire length and in the locations shown on the excavation support system design. The Contractor is responsible for providing all steel shims and/or re-driving sheets such that the internal bracing system can be installed as shown on the Contract Documents.
4. Drive sheeting such that the ball of the interlock is below the socket of the mating interlock to minimize plugging of interlocks.
5. If the excavation support system is unable to be installed as designed due to unforeseen field conditions, cease installation and notify the Engineer/CM.
6. Drive all sheet piles to the tip elevations shown on the Contract Drawings.
7. If refusal is encountered at a higher elevation than shown on the drawings, stop driving the pile and move on to the next. The Owner or Engineer/CM will advise as to what action is to be taken on the refused pile. Possible actions include, accepting the pile as driven, additional driving with the same or larger equipment, performing borings to determine the nature of the obstruction, and/or instituting special procedures to penetrate or clear the obstruction. If actions are required as the result of obstructions, the Owner will negotiate an equitable change in the price of the Contract with the Contractor.
8. Drive all sheet piles within 3 inches of plan location.
9. Repair or replace any sheet piles damaged during installation at no additional cost to the Owner.
10. Maintain accurate records of each sheet pile installation. Include pile reference number, type of pile, detailed driving record, final tip elevation, deviations from design location and alignment, lateral deflecting and settlement measurements, and all other data pertaining to the pile installation and performance.
11. The installation of the excavation support system should generally conform to the following sequence
    a. Pre-trench as necessary along the location of the sheetpiles.
    b. Install the template and drive each sheet pile to the appropriate tip elevation.
    c. Excavate inside the sheetpiles to a maximum depth of 2 feet below the brace level.
    d. Install the internal bracing.

e. Dewater within the limits of the cell as required to maintain a dry and stable excavation bottom.

f. Excavate inside the cell to the target elevations.

g. Allow the Engineer/CM to observe the conditions at the target excavation grades and collect documentation samples in each cell before beginning to place fill.

h. Backfill the excavation until the top of the fill surface is 2 feet or less below the brace level.

i. Remove the internal bracing.

j. Backfill the excavation to pre-construction elevations leaving only enough vertical clearance to allow for the construction of the surface restoration.

k. Remove the sheet piles, with proper abandonment of void space.

l. Repeat the above steps for the construction, excavation, and backfill of each subsequent cell.

m. Maintain accurate records of the excavation support system installation. Include type of steel member, detailed installation record, final elevation, deviations from design location and alignment, lateral deflection and settlement measurements, and all other data pertaining to the installation and performance.

3.03 SETBACKS

A. Do not allow construction machinery within 5 feet of the vertical face of the existing retaining wall.

B. Maintain soil stockpile offsets as shown on the Contract Documents.

3.04 FIELD QUALITY CONTROL

A. The Engineer/CM will visually inspect and verify the installed NAPL barrier wall dimensions and locations.

B. Prior to backfilling the excavated area where the sheet piles were installed, a licensed State of New York professional surveyor must verify the depths and locations of the installed NAPL barrier wall.

3.05 REMOVAL

1. Remove all components of the systems, after the excavation and backfill has been completed.

2. Remove the excavation support systems, and abandon the void space, using grout or other method acceptable to the Engineer/CM, in accordance with all applicable state and local regulations.

END OF SECTION 31 41 00

SECTION 32 12 00

ASPHALT PAVEMENT

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the installation of flexible, hot-mix, hot-laid, asphalt concrete pavement (HMA).

B. Installation of pavement and/or any related structures must be carried out in accordance with City of Schenectady requirements and the State of New York Department of Transportation (NYSDOT) Standard Specifications.

C. The Work includes

1. Preparation such as saw-cutting, cold milling, cleaning, compaction, and other preparation for installing asphalt concrete pavement.
2. Providing asphalt concrete paving materials.
3. Providing tack coat material.
4. Providing infrared joint treatment in patched areas.
5. Providing quality controls and testing.

D. Coordination

1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before paving.

1.02 GENERAL

A. Properly surface the full width of all surfaces to be restored.

1.03 SOURCE QUALITY CONTROL

A. Qualifications

1. Asphalt Concrete Production Facility: Production facility for asphalt concrete, tack coat materials, and other bitumastic materials shall be approved by NYSDOT for furnishing such materials for NYSDOT use.
2. Remediation Contractor's Testing Laboratory: Retain the services of an independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section. Testing laboratory shall comply with ASTM E329, and shall be experienced in the types of testing required.

B. Regulatory Requirements

1. Comply with applicable requirements of the NYSDOT Standard Specifications (latest edition) and Standard Sheets.

C. Testing

1. Test bituminous materials and asphalt concrete mix design for each asphalt concrete material in accordance NYSDOT requirements.

2. To facilitate laboratory testing, Remediation Contractor shall

a. Secure and deliver to testing laboratory representative Samples of materials that Contractor proposes to furnish and that are required to be tested.

b. Furnish such labor as is necessary to obtain and handle Samples at the Site or at asphalt concrete production facility and other material sources.

c. Advise testing laboratory and Engineer/Construction Manager (CM) sufficiently in advance of operations to allow for completion of tests and for the assignment of personnel.

1.04 SUBMITTALS

A. Mix Design

1. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section. Provide complete data on materials, including location of the Work, source, material content and percentages, temperatures, and all other pertinent data.

2. Proposed gradation for each aggregate to be used for subbase and in asphalt paving material. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.

3. In lieu of the information required above, submit certificates of compliance with the reference specifications, for each for the following

a. Each asphalt concrete mix design required.

b. Bituminous materials required.

c. Aggregates to be used in asphalt paving, from each material source and each required gradation.

d. Density of uncompacted asphalt concrete material.

e. Density of previously-compacted, previously-tested asphalt concrete material.

f. Density and voids analysis for each asphalt concrete material test specimen.

g. Evidence of asphalt concrete plant inspection and compliance with the reference specifications.

B. Pavement Markings

1. Submit manufacturer cut sheets for all pavement paints proposed for use to the Engineer for review and acceptance prior to application.

C. Informational Submittals

1. Qualifications Statements

a. Asphalt Concrete Production Facility: Submit name, address, and proof of NYSDOT approval for asphalt concrete production facility.

b. Remediation Contractor's Testing laboratory: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform source quality control and field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.

D. Quality Control Test Data Submittals

1. Submit for 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 Remediation Contractor.

F. Field Quality Control Submittals

1. Submit results of required field quality control testing.

1.05 SITE CONDITIONS

A. Environmental Requirements

1. Temperature

a. Place HMA when the adjacent pavement surface temperature is equal or greater than those specified in NYSDOT Table 402-1.

2. Prohibitions

a. Do not place asphalt paving materials when weather is foggy or during precipitation.

b. Do not place asphalt paving materials when the base on which the material will be placed contains moisture in excess of optimum.

c. Place HMA top course within the seasonal limits provided by NYSDOT.

d. Place asphalt paving materials only when Engineer/CM concurs that weather conditions are suitable.

PART 2 MATERIALS

2.01 ASPHALT CONCRETE MIXES

A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with the NYSDOT Standard Specifications

1. Binder Course: NYSDOT 25 F9 Binder Course HMA, 80 Series Compaction.

2. Surface Course: NYSDOT 12.5 F2 Top Course HMA, 80 Series Compaction.

2.02 BITUMINOUS MATERIALS

A. Bituminous Materials for Asphalt Concrete

1. Bituminous materials for asphalt concrete shall comply with the NYSDOT Standard Specifications.

B. Tack Coat

1. Tack coat shall be emulsified asphalt that conforms to the requirements of NYSDOT Section 702.

2.03 AGGREGATES IN ASPHALT PAVEMENTS

A. Aggregates for Asphalt Concrete

1. Aggregate materials used in asphalt pavement shall be in accordance with the NYSDOT Standard Specifications for the required mixes.

2.04 PAVEMENT MARKING PAINT

A. Furnish pavement marking paint that is in compliance with all NYSDOT requirements.

PART 3 EXECUTION

3.01 GENERAL

A. Perform the work consisting of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in accordance with this section shall conform to the lines, grades, thicknesses, and typical cross sections indicated. Construct each course to the depth, section, or elevation required by the drawings and roll, finish, and approve it before the placement of the next course.

1. Subbase Course: Place and compact subbase material in accordance with the Contract Documents.

2. Asphalt Pavement Courses: Provide the following minimum thicknesses to match the existing pavement section

a. Binder Course: 2.5 inches compacted thickness.

b. Surface Course: 1.5 inches compacted thickness.

3.02 INSPECTION

A. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.

B. Construct paved surfaces to the lines, grades, and typical sections shown or indicated. If grading is not provided, match existing lines and grades.

C. Examine the subgrade, subbase, and base on which asphalt paving will be installed and notify Engineer/CM 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.

D. Do not place materials on subgrades or subbase that is muddy or has water thereon.

3.03 PREPARATION

A. Before starting installation of asphalt paving, perform the following

1. Grade Control: Establish and maintain throughout asphalt paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.

2. Subgrade: The subgrade shall be shaped to line and grade and compacted in accordance with the Contract Documents.

3.04 TRANSPORTING AND PLACING

A. Transporting

1. Asphalt concrete mixture shall be transported to the area of paving and placed as soon as possible after mixing.

2. Transport the hot-mix asphalt from the mixing plant to the Site in clean, tight vehicles. Schedule deliveries so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver.

3. Provide adequate artificial lighting for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 60 degrees C 140 degrees F. To deliver mix to the paver, use a material transfer vehicle operated to produce continuous forward motion of the paver.

B. Placing

1. Place and compact the mix at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Upon arrival, place the mixture to the full width by an asphalt paver; it shall be struck off in a uniform layer of such depth that, when the work is completed, it will have the required thickness and conform to the grade and contour indicated. Regulate the speed of the paver to eliminate pulling and tearing of the asphalt mat.

2. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3. Placement of each asphalt concrete course shall be completed over the full width of the section under construction during each day's paving operations.

4. 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 CM.

5. 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.

a. 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.

b. 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.

3.05 JOINTS

A. Pavement Patching/Repair

1. When pavement is to join previously-laid pavement or concrete, 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 saw-cut 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.

B. Tack Coat

1. Provide tack coat material at the following locations

a. At edges where new pavement will connect to existing or previously-installed pavement.

b. 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 Remediation Engineer.

c. Where new pavement will abut curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.

2. Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with NYSDOT standard specifications.

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 the 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. Transverse Joints

1. Use of transverse joints are not permitted.

3.06 COMPACTION

A. After placing, the mixture shall be thoroughly and uniformly compacted by rolling. Compact the surface as soon as possible without causing displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction.

B. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once. Furnish sufficient rollers to handle the output of the plant. Continue rolling until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, keep the wheels properly moistened but excessive water will not be permitted.

C. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers.

D. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective shall be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching will not be allowed.

E. Rollers

1. 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.

2. Required rollers shall be in acceptable operating condition, prior to placing of asphalt concrete.

3. 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.

4. 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.

5. 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.

6. At all times, roller motion shall be slow enough to avoid displacing the asphalt concrete.

7. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.

8. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.

9. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

10. 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.

F. Each compacted asphalt concrete course shall be within plus-or-minus 1/4 inch of the indicated thickness. Total thickness of asphalt pavement shall be within plus-or-minus 1/2 inch of the indicated thickness.

G. Curing

1. Do not allow traffic onto pavement until directed by Remediation 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 Remediation Engineer.

H. Defective Pavement Work

1. When directed by Remediation Engineer, remove and replace defective asphalt paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

3.07 FIELD QUALITY CONTROL

A. On-Site Material Testing

1. Employ a testing laboratory to perform field quality control testing. Submit certified reports of all test results to Contractor and CM within 24 hours of testing.

a. Measure temperature at time of placement.

b. Perform field density tests to verify that required compaction of asphalt materials has been obtained.

c. Test the proposed materials for compliance with the Contract Documents.

2. Density

a. Asphalt: Test in accordance with ASTM D2950/D2950M. Test one sample every 1,000 square feet of pavement. Test for each asphalt concrete course installed.

b. Subbase: Test in accordance with ASTM D6938/D6938M. Test one sample every 1,000 square feet of pavement. Test for each lift of sub-base course installed.

c. In addition, when directed by Remediation Engineer, compare density of in-place asphalt paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.

d. 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.

3. Asphalt Concrete Pavement Thickness Depth check readings shall be taken for each course of compacted pavement at a frequency of one reading from every 1,000 square feet of compacted pavement. Comply with thickness tolerance specified in Article 3.03 of this Section.

4. Repair holes from test specimens in accordance with this Section's requirements for repairing defective Work.

B. Surface Smoothness

1. Test finished surface of each asphalt paving course for smoothness, using a 10-foot straightedge applied parallel to and at right angles to centerline of paved areas.

2. Check surfaced areas at intervals as directed by Engineer/CM.

3. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following

a. Binder Course: 3/8 inch vertical in 10 feet horizontal.

b. Top Course: 1/4 inch vertical in 10 feet horizontal.

4. Crowned Surfaces

a. Test crowned surfaces with a crown template, centered and at right angles to the crown.

b. Surfaces will be acceptable when variance is equal to or less than 1/4 inch from the template.

5. Elevation of finished surface of pavement shall be within plus-or-minus 1/2 inch of elevations shown or indicated.

3.08 CLEANING

A. After completing paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.09 PROTECTION

A. Protect finished pavement until pavement has become properly hardened and cool.

1. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

3.10 RESTORATION OF PAVED SURFACES

A. Surface the paved surfaces that were removed to accommodate the excavation Work performed during the Remedial Action (RA), as shown on the Contract Drawings.

B. Complete all restorations in accordance with the City of Schenectady requirements, where applicable.

3.11 APPLICATION OF PAVEMENT MARKINGS

A. Replace all pavement markings in kind.

B. Restripe pavement markings removed during construction with two coats of acrylic traffic marking paint at the same locations and orientation unless otherwise directed by Engineer. Color to be approved by the Engineer prior to application. Paint surface preparation, mil thickness, and application procedures are to be per the manufacturer's recommendations and in accordance with NYSDOT requirements, if applicable.

END OF SECTION 32 12 00

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this Section includes furnishing all labor, materials and equipment, and performing all Work required to replace storm drainage piping, connections, and structures for the Site.

1.02 BYPASS

A. A storm drainage bypass system is required as part of the Work during all times when the existing storm drainage system is impacted by the remedial excavation or other project activities.

B. For the purposes of this Contract, a pumped bypass system is required. Bypass all flow from the storm drain system entering the manhole ST1, located at the intersection of Clinton St. Extension and Van Guysling Ave. through a closed pipe system and discharge this flow into the headwall of the culvert at Schermerhorn Creek.

C. Provide all traffic control, permits, pumps, pipes, connections, temporary power and all other components to provide a successful bypass system for the duration of the Work.

D. Any damage caused by the failure of the bypass system or by failure to properly divert and/or discharge the stormwater flow is the responsibility of the Contractor.

1.03 SUBMITTALS

A. Submit product data on pipes, gaskets, fittings, connections, pipe accessories, tracer wire, drainage structures, check valve, and appurtenances.

B. Submit a detailed plan and description of proposed bypass pumping system that includes the size, material, location and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow. Also include:

1. Size and location of manhole or access points for suction and discharge hose or piping.
2. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried.
3. Temporary pipe supports and anchoring required.
4. Thrust and restraint block sizes and locations.
5. Plugging method, details, and size/type of plugs.
6. Bypass pump sizes, capacity, number of each size to be on site and power requirements.
7. Backup pump, power and piping equipment.

8. Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range.

1.04 AS-BUILT DOCUMENTS

A. Accurately record location of pipe runs, connections, structures, cleanouts, frames, rims, and invert elevations.

B. Record and describe unexpected variations in subsurface conditions or discovery of unknown or unmarked utilities.

PART 2 MATERIALS

2.01 DRAINAGE STRUCTURES

A. Pre-cast drainage structures in accordance with New York State Department of Transportation (NYSDOT) Standard Specification Section 604 and NYSDOT Standard Detail Sheets 604-02 to the sized indicated in the Contract Documents.

B. Structures to have a minimum inside dimension of 5 feet.

2.02 FRAMES, COVERS, AND GRATES

A. Cast iron frames, covers, and grates in accordance with City of Schenectady standard details, NYSDOT Standard Specification Section 655 and NYSDOT Standard Detail Sheet 655-02.

B. Provide frames and covers or access doors for the bypass pumping vault of sufficient sizes to accommodate the pump intakes.

C. Traffic rated access doors are required.

2.03 BYPASS PUMPS

A. Provide fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.

B. Minimum pumping requirements:

1. 2,500 gpm with peak capacity of 7,500 gpm

2. 30 feet of static head

3. Minimum solids handling of 3 inches.

C. Power supply to be determined by Contractor; electric or diesel powered.

D. Constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.

E. Provide all necessary controls, valves, floats, and switches to accommodate all necessary stop/start controls for each pump and to allow rapid changeout should a pump fail.

F. Sound attenuating enclosures capable of limiting noise levels at or below 70 dBA at 30 feet.

2.04 SUBSURFACE PIPING

A. Furnish temporary and permanent materials for the construction of the piping as required for the Work and as indicated in the Contract Documents.

B. Dual wall HDPE pipe with smooth interior and water-tight bell and spigot joints per ASTM F2648 and NYSDOT Sections 603 and 706-12.

C. Bell and spigot connections/fittings shall utilize a welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.

D. Use a joint lubricant approved by the pipe manufacturer during assembly.

2.05 BYPASS PIPING

A. Provide abrasion resistant, watertight piping with restrained joints suitable to pass the required discharge volume and pressure.

B. Incorporate anticipated traffic/equipment/impact loading conditions into piping design and/or selection.

C. If subjected to traffic loading, incorporate traffic ramps or covers into the bypass system design.

2.06 GASKETS

A. Use nitrile gaskets in accordance with ASTM F477 for all pipe and structure connections.

B. Installed by the pipe manufacturer and covered with a removable, protective wrap to ensure that the gasket is free from debris.

2.07 CONNECTIONS

A. Kor-N-Seal II 206 Series or approved equal.

B. Pre-installed nitrile gaskets in pre-cast structures.

C. Use all necessary adapters required to accept corrugated pipe.

2.08 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size, end design, and design pressure of mainline pipe in required wyes, bends, elbows, reducers, traps, and other configurations required.

B. Miscellaneous accessories: All accessories to install and connect pipe shall be as recommended and approved by pipe manufacturer.

2.09 DETECTABLE WARNING TAPE

A. Minimum 5 mils thick and feature a print style which cannot be scraped off or erased.

B. Minimum six inches in width and shall read: “CAUTION – PIPE BELOW” and green in color.

C. Woven and reinforced for non-stretch, non-distorting, high-strength for plowing requirements.

2.10 TRACER WIRE

A. Installed with buried HDPE pipe to permit location with an electronic pipe locator.

B. Run parallel and continuously without splices between adjacent structures and shall terminate with a 6 ft. long coil stored within the manhole structure.

C. Direct Bury Rated, Sold #12 AWG Annealed Copper Tracer/Locator wire as manufactured by Kris-Tech Wire Co. or approved equal.

2.11 PLUGS

A. Select and install pneumatic plugs suitable for size of line to be plugged, pipe and manhole configurations and expected operating conditions.

B. Provide additional plugs on-site in the event a plug fails.

C. Replace/reconfigure plugs as necessary.

PART 3 EXECUTION

3.01 DRAINAGE STRUCTURES AND PIPES

A. Construct the drainage structures and piping at the locations and elevations as shown on the Contract Documents.

3.02 EXAMINATION

A. Verify that subgrade is ready to receive Work, and excavations, dimensions and elevations are as indicated on Drawings.

B. Construction shall be in accordance with the latest revision of the NYSDOT Standard Specifications and Standard Details.

C. Observe and monitor all active existing utilities adjacent to the work area.

D. Coordinate work near the existing sewer force main with the City of Schenectady.

E. Coordinate work near the existing gas line with National Grid Gas Operations.

3.03 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with geotextile and crushed stone at no additional cost to the Owner.

B. Remove cobbles, boulders, debris or other hard matter which could damage drainage pipe or impede consistent backfilling or compaction.

C. Maintain and carefully protect existing live sewers and service leads during the construction of the sewers.

D. Immediately repair or replace damaged sewer or service leads.

E. Keep service interruptions to a minimum and coordinate with the local municipality or utility company.

F. Install and operate localized dewatering systems to keep the excavations and trenches free from standing water and to provide a firm and stable subgrade.

G. Excavated material from utility installations to be stockpiled for off-Site disposal.

3.04 SHORING

A. Design, fabricate/furnish, install and remove all temporary shoring systems required to complete the Work.

B. Shore all open-cut trenches and excavations as required by applicable Federal and State Codes and as may be necessary to protect life, property, or the Work.

C. Portable trench boxes or sliding trench shields approved by applicable State and Federal agencies may be used. Use of the shield shall not relieve the Contractor of any liability for damages to persons or property occurring from or upon the work of construction of underground utilities or appurtenances occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place in the trench sufficient sheathing and bracing to prevent caving or moving of the ground, or disturbance of the completed Work or any surface of subsurface structures.

D. Do not slide trench boxes or shields within the trench or excavation so as not to pull the already jointed pipe apart or leave voids around the pipe wall.

E. Provide an acceptable method of rechecking line, grade and horizontal location of pipe after the shield has been moved ahead. If the pipe has moved, it shall be reset to the proper line and grade at the Contractor's expense.

F. The width of the shoring system shall be such that a minimum of one-foot horizontal clearance is maintained between the pipe and shoring system.

G. Any voids occurring between the trench box or shield and the undisturbed trench wall within the pipe zone (bottom of trench to top of cover material) shall be backfilled, immediately after the box or shield is positioned.

3.05 BYPASS

A. Provide temporary bypass all of the flow of water discharged through the existing storm drainage network collected in manhole ST1 during the Work.

B. Provide float switches and all other controls to allow the system to operate at varying inflow rates.

C. Sequence the Work to minimize the amount of time when bypass pumping is required and while the storm drainage system is offline.

D. Determine location of bypass intake, outlet, and pipe alignment and obtain all necessary approvals.

E. Make all connections to the existing system and construct temporary bypass infrastructure as required by the Contract Documents and all other applicable permits and/or approvals.

F. Bypass Pipelines may be placed along shoulder of roads with the necessary permits/approvals from the City of Schenectady.

1. Do not place in streets or sidewalks.
2. When bypass lines cross local streets and private driveways, install roadway ramps or other suitable devices. If, roadway ramps cannot be used, place bypass in trenches and restore the surface cover accordingly.

G. Plug existing storm drainage lines as necessary to make the connections and complete the Work. Inspect the plugs a minimum of once per week and repair/replace as necessary. Have a minimum of one backup plug of each side available on-site for the duration of the bypass Work.

1. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

H. Provide sound attenuated enclosures.

I. Provide backup equipment and ancillary components on-site to provide full system redundancy.

J. During bypass pumping operation, protect existing infrastructure from damage.

K. Upon completion of bypass pumping operations, and after the receipt of written permission from the City of Schenectady, National Grid, and the Engineer/CM, remove piping, restore property to pre-construction condition and restore pavement.

L. Any damage caused by failure to bypass the stormwater flow or improper discharge of bypass flows is the responsibility of the Contractor.

M. Coordinate bypass Work with the City of Schenectady Department of Engineering.

3.06 INSTALLATION - PIPE

A. Install pipe in accordance with the latest revision of the NYSDOT Standard Specifications and the manufacturer's recommended installation guidelines.

B. Utilize laser equipment for the installation of all pipe.

C. Invert elevations at each manhole shall be field verified and where deviations from plan elevations are encountered, the Engineer shall be notified.

D. Lay pipe to slope gradients noted on Drawings with maximum variation from true slope of 1/8 inch in 10 feet.

E. Connect to existing infrastructure in accordance with the latest revision of the NYSDOT Standard Specifications and City of Schenectady requirements.

F. Bed and backfill pipe in accordance with NYSDOT and City of Schenectady requirements. Compact granular backfill above pipe in accordance with the Contract Documents.

3.07 INSTALLATION - DRAINAGE STRUCTURES

A. Form bottom of excavation clean and smooth to correct elevation.

B. Precast reinforced concrete units shall be constructed in accordance with ASTM C478 and the details shown on the Drawings. They shall be constructed on precast concrete footings supported by a compacted crushed stone or structural fill.

C. Mortar: Do not use mortar that has attained initial set or has hardened to the extent that additional water is needed to restore workability.

D. Brickwork: Lay brick in all header courses in circular walls to form full and close mortar joints on their beds, ends, and sides in one operation. Make vertical joints radial from the center. Build brickwork around pipe inlets and outlets neatly; seal the pipe tightly in the wall.

E. Concrete Masonry Units: Construct walls in horizontal courses, with vertical joints broken. Lay units in mortar and fill joints completely with mortar.

F. Establish elevations and pipe inverts for inlets and outlets as indicated on the Contract Documents.

G. Mount frame level in grout, secured to top cone section to elevation indicated on the Drawings.

H. Use no more than 4 adjusting rings to obtain proper rim elevations.

3.08 INSTALLATION - TRACER WIRE

A. Install tracer wire in a continuous run from manhole structure to manhole structure. Provide a six-foot-long coil in each manhole suspended from the top step of the manhole.

3.09 INSTALLATION - DETECTABLE WARNING TAPE

A. Detectable warning tape shall be installed centered directly above buried pipe at a depth below the finished grade surface, as approved by the City of Schenectady.

3.10 FIELD QUALITY CONTROL

A. Request inspection by Engineer prior to backfilling.

B. Test the operation of the check valve by plugging the inlet to Manhole ST12 and filling Manhole ST12 with water. Monitor operation/discharge from the check valve and record the water level in the manhole which discharge is observed from the check valve.

C. Coordinate observation of the check valve test with the Engineer and the City of Schenectady.

3.11 PROTECTION

A. Implement and maintain temporary erosion control measures.

B. Protect pipe from damage or displacement until backfilling operation is complete.

C. Protect manholes, and existing structures from damage or displacement until backfilling operation is complete.

D. Protect drainage ditches from erosion.

E. Correct unacceptable Work at no expense to the Owner.

3.12 RESTORATION

A. Restore Work area to the existing conditions. Replace all pavement subbase, asphalt paving, curbing, sidewalks and other items disturbed during the Work in accordance with the Contract Documents, NYSDOT Standard Specifications, and to the satisfaction of the City of Schenectady.

END OF SECTION 33 40 00

SECTION 44 01 40

OPERATION AND MAINTENANCE OF WATER TREATMENT EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the treatment and discharge of impacted water collected during dewatering, decontamination, and other operations.

B. Provide a water treatment system (WTS) capable of treating water generated during construction, as described in the Contract Documents, to the treatment standards required by the discharge permit and local limits set by the City of Schenectady Publicly Owned Treatment Works (POTW).

C. Bidders must determine their own specific requirements for dewatering and water treatment based on their selected means and methods of construction. Requests for Change Orders based on perceived errors or omissions in the water model information provided as part of the Contract Documents will be denied.

D. Furnish the design, materials, and methods required for construction of the water treatment system subject to the design criteria. Working drawings and supporting computations for the WTS are to be prepared and stamped by an experienced Professional Engineer licensed to practice in the State of New York.

E. Pay all water withdrawal, treatment, and disposal/discharge permit fees, including, but not limited to application, administrative, discharge/volume, and closeout fees.

F. Pay all fines and penalties associated with non-conformance of the WTS that may be assessed by the authority granting the permit.

G. The contaminant concentrations that have been measured in groundwater from wells within the limits of excavation are reported in the Clinton St OU2 (Postage Stamp) RAWP.

H. The criteria to discharge treated water will be as required by the local limits set by the POTW and associated permits obtained by the Contractor.

I. Verify the requirements with the permit issuing authority and make any required adjustments prior to, and during the performance of the Work. Notify the Engineer/Construction Manager (CM) of any changes to the requirements of the permit during the Work.

1.02 SUBMITTALS

A. In the water treatment section of the Site Operations Plan, submit the following information

1. Description of WTS, equipment (including size and capacity), processes, and monitoring.

2. Operation & maintenance plan to include regular maintenance, routine inspection requirements, daily operating procedures, and record keeping.

3. Calculations and supporting documentation for the water treatment system design, component selection, and sizing.

4. Description of the phasing and coordination between the water treatment system, excavation, and dewatering portions of the Work.

5. A backup liquid disposal contingency plan.

B. After being awarded the project

1. Contractor shall design a WTS to meet the expected volume and discharge requirements. Contractor shall perform any required bench/ pilot tests to validate the treatment system design. The design shall include

   a. Description, layout, and process and instrumentation diagram (P&ID) of WTS, equipment (including size and capacity), processes, controls, instrumentation, and monitoring.

   b. Electrical one-line, load calculations.

   c. Contractor shall submit an Operation & Maintenance (O&M) plan with their design of the WTS to include regular maintenance, monitoring, and daily operating and record- keeping procedures, including performance parameters and operation and equipment logs. The O&M plan shall be prepared consistent with the requirements of this section.

   d. Calculation and support documentation for treatment system design, component selection and sizing.

   e. Coordination summary for the excavation dewatering system.

   f. A backup liquid plan.

   g. A coal tar NAPL separation and management plan.

   h. Detailed design of the energy dissipation system for the WTS discharge flow.

   i. Proposed alterations to the minimum required system shown in the Contract Drawings.

   j. The WTS design shall be prepared by a Professional Engineer registered in the State of New York.

2. During the WTS operation period, Contractor shall provide daily Operation Logs to the Engineer/CM summarizing the following information

   a. Volume of water, in gallons, discharged from the WTS during that day. This value is determined from a continuously totalizing flow meter.

   b. Hours of treatment system operation.

   c. Peak flow rates.

d. Activities related to the O&M of the system including operations, maintenance, inspections, and monitoring.

e. The daily log will be kept on Site and will be made available to the Engineer/CM on demand. Copies of each daily log sheet shall be submitted to the Engineer/CM on a daily basis.

f. Process variables shall be recorded at a minimum frequency of once per shift or as requested by the Engineer/CM.

1.03 CITY OF SCHENECTADY POTW REQUIREMENTS

A. Comply with all requirements listed in the City of Schenectady Public Sewer Discharge Standards and Limitations, Article VI of Section 220 of the City of Schenectady Code, available online here: https://ecode360.com/8689434

B. Contact Christopher Andriano at the City of Schenectady Water Pollution Control Plant for additional information at 518-631-0037.

C. Pay all fees, including, but not limited to:

1. Administrative fee of $100.00

2. Permit fee of $200.00

3. Discharge fee of $25.00 per 1,000 gallons discharged to the POTW.

D. Provide all pre-discharge sampling and compliance sampling and reporting to the POTW as required in the applicable permit(s).

E. Compliance sampling frequency, maximum daily flow, and discharge location will be determined during the permitting process by the City of Schenectady Director of Water and Wastewater.

F. Default temporary discharge permit is valid for 90 days, and extensions may be requested from the POTW.

G. Discharge of treated groundwater shall be made directly to the sanitary sewer without runoff from the site surging onto the affected street or adjacent properties.

H. Abide by and conform with the City of Schenectady's Sewer Use Ordinance at all times during the discharge event. If any noticeable change in wastewater characteristic or operational difficulties are experienced, the City reserves the right to reverse the above-mentioned decision.

I. Notify Christopher Andriano prior to initial discharge and upon completion of the temporary discharge.

PART 2 PRODUCTS

2.01 PRIMARY WATER TREATMENT EQUIPMENT

A. Provide a system capable of performing the following unit process functions

1. Separation and recovery of LNAPL and DNAPL products recovered with the water.

2. Removal of suspended solids by gravity separation and filtration.
3. Removal of volatile and semi-volatile organic compounds to the limits set forth by the permit issuing authority.
4. Removal of metals to the limits set forth by the permit issuing authority.
5. Discharge flow metering.

B. Choose the type and size of equipment and components needed to accomplish the functions designated.

C. System capacity to be

1. 200 gpm continuous with 400 gpm peak or 2 times the maximum calculated dewatering flow rate, whichever is greater.
    a. Include provisions to increase capacity to 500 gpm.
2. Minimum storage of 50,000 gallons.

D. Minimum of two tanks; one to settle out large particles and collect NAPL, and the other to act as a settling/equalization tank.

E. Furnish a discharge pump with sufficient flows and pressures to achieve a discharge rate capable of maintaining the groundwater levels a minimum of 2 feet below the bottom of the excavation. Provide a standby generator with sufficient capacity to provide power to the water treatment system and dewatering operations in the case of an electrical outage. Wire the equipment such that dewatering and treatment may continue without interruption or with only minor interruption in the event of a power outage.

F. If the Engineer/CM determines that freeze protection will be required, the Contractor will be directed to provide freeze protection, which will be measured for payment under the applicable alternative pay Item. If directed by the Engineer/CM to furnish and install freeze protection, provide it for all water treatment system equipment, piping, and pipe connections to allow for operation through the winter months, including but not limited to: insulation, enclosures, heaters, bubblers, heat tapes, and circulation pumps.

G. The materials and equipment used for the WTS may be new or used but must be suitable for the Work and be maintained in good condition.

H. Keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown.

I. All water treatment and storage equipment will remain the property of the Contractor or Subcontractor. Decontaminate all water treatment equipment prior to removal from the Site, as required in the Contract Documents.

J. Provide and maintain a flow meter that meets the discharge requirements and is capable of recording instantaneous and totalized flow. Provide calibration records for the meter.

K. Provide sampling ports for collecting samples in accordance with the requirements of the discharge permit.

L. If directed by the Engineer/CM, provide adequate freeze protection for the operations and protection of all water treatment equipment.

M. Provide all necessary safety equipment and personnel protective equipment for safe handling of contaminated water and water treatment chemicals.

2.02 TREATMENT MEDIA

A. Furnish and install new, high-quality treatment media as required by the Contract Documents and the approved Wastewater Treatment System design.

B. Provide media changeouts at necessary intervals to continuously meet the acceptance criteria/local limits and avoid contaminant breakthrough.

2.03 WATER TREATMENT SYSTEM CONTROLS

A. Provide adequate system controls to permit unattended operation with occasional operator checks for monitoring and adjustments.

B. Provide a notification system, such as pressure gages, to alert an operator if the system experiences conditions that will potentially cause the treatment system to shut down.

C. Provide high-level alarms on tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the operator.

D. If an upset condition occurs, which may result in a release or nonconformance with the discharge permit, immediately suspend operation and notify the Engineer/CM.

PART 3 EXECUTION

3.01 WATER TREATMENT - GENERAL

A. Furnish all labor, materials and equipment, and perform all operations required to design, furnish, install, test, operate, and maintain the water treatment equipment, including: storage tanks, pumps, process equipment, water treatment chemicals, water meters, process controls, operator alarms, dikes, sandbags, electric power supply and distribution, and domestic water supply and distribution, as required to treat the collected water.

B. Perform a pre-production test of the entire WTS in accordance with the requirements of the discharge permit and any other applicable required permits. At a minimum, the pre-production test must consist of the collection and treatment of one settling tank of representative groundwater. Prior to discharge, analytical test results for treated samples collected under the supervision of the Engineer/CM must demonstrate that the treated water is in compliance with the discharge permit requirements.

C. Depending on the Contractor selected means and methods, it may be necessary to provide additional storage capacity for treated wastewater to allow the treatment system to operate in compliance with the requirements of the discharge permit (i.e. batch discharging).

D. Discharge the WTS at the location that has been approved by the Engineer/CM.

E. Place equipment within the Project Limits and relocate equipment if required by the Contractor's work activities or sequence. Equipment, in as much as possible, should be located in a permanent location for the entire duration of the Project.

F. Arrange components and provide means to contain any spills or overflows from the treatment process within the Site.

G. Provide spill containment for any water treatment chemicals used on the Site.

H. Provide additional erosion and sediment control measures, as necessary, to ensure that all components of the WTS are enclosed.

I. Establish, maintain, and document quality control, as required in the Contract Documents.

J. The Engineer/CM may specify and require additional records from the Contractor as needed to satisfy permit and Project requirements.

3.02 SEQUENCING AND SCHEDULING

A. Conduct water treatment activities in conjunction and coordination with decontamination, excavation, dewatering, and backfilling Work. Coordinate water treatment with all other Site activities.

B. Provide a WTS with the treatment and storage capacity to manage water from dewatering and decontamination Work that adheres to the discharge limit without causing construction delays.

3.03 DISPOSAL OF OTHER RESIDUALS

A. Manage settled solids, collected NAPL, and spent filtration and granular activated carbon adsorption media in accordance with all transportation laws, regulations, and the receiving facility requirements.

B. Groundwater and decontamination wastewater which is not treated and discharged under an appropriate permit, shall be disposed of at an off-Site liquid waste treatment facility at no additional cost to the Owner.

3.04 DISCHARGE LIMITS

A. The Contractor shall at all times maintain the treatment system so as to not exceed the effluent limits as required by the applicable permit requirements for the WTS discharge.

B. Sampling in compliance with permit requirements shall be by the Contractor. The Contractor shall provide the results to the Engineer/CM for review prior to submittal to the appropriate agency.

C. Contractor is responsible for providing documentation of their O&M activities including material changeout, reagent calibrations, and flow measurements.

D. Comply with the discharge limitations and total concentration limits (TCLs) provided in Section 220-37 of the Code. Provide additional analyses for VOCs and SVOCs; TCLs for individual VOC and SVOC compounds shall not exceed 100 ug/L.

E. A pre-discharge sample and weekly compliance sampling is required before and during discharge to the POTW. Submit sample results to the Engineer/CM and the City of Schenectady in accordance with the applicable permit requirements.

F. Maximum daily discharge to be determined during the discharge permitting process and may not exceed 5% of the mean daily inflow of the POTW. Contact the City of Schenectady POTW for values based on the proposed schedule for the execution of the remedy. Provide sufficient on-site storage at all times based on the flow limitation and the proposed construction activities/sequence. Off-site transportation and disposal of wastewater may not be used in lieu of sufficient on-site storage.

3.05 SAMPLING AND CHEMICAL ANALYSIS

A. All sampling and laboratory analyses, as required by the discharge permit, will be performed by the Contractor. Analysis turnaround time to be selected by the Contractor based on work sequence.

B. All sampling and laboratory analyses conducted for off-Site disposal of wastewater will be performed by the Contractor.

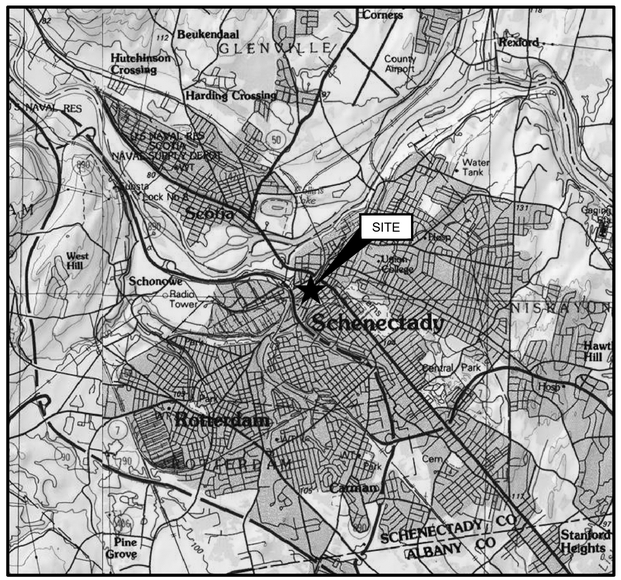
C. All laboratory analyses will be conducted using the appropriate analytical methods and by a laboratory that is appropriately licensed to perform such Work in the State of New York.

D. Forward the results of all analytical laboratory tests to the Engineer/CM, upon receipt.

END OF SECTION 44 01 40

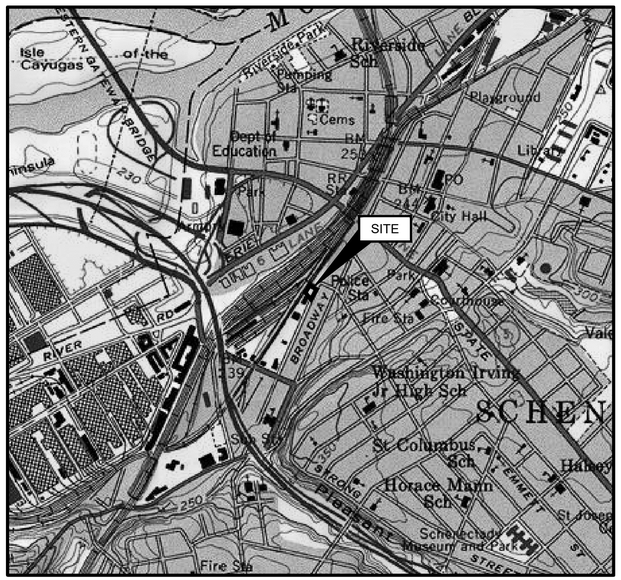
REMEDIAL DESIGN DRAWINGS

CLINTON STREET FORMER MANUFACTURED GAS PLANT (MGP) SITE
NYSDEC SITE NO. V00474
OPERABLE UNIT NO. 2 (OU2) - OFFSITE IMPACTS
CITY OF SCHENECTADY, SCHENECTADY COUNTY, NEW YORK



SOURCE:
U.S.G.S. TOPOGRAPHIC MAPS, 1:24,000, SCHENECTADY, NY.
MAP CREATED WITH TOPO! ® ©2001 NATIONAL GEOGRAPHIC (www.nationalgeographic.com/topo).

REGIONAL MAP
SCALE: 1" = 2 MILES



SOURCE:
U.S.G.S. TOPOGRAPHIC MAPS, 1:24,000, SCHENECTADY, NY.
MAP CREATED WITH TOPO! ® ©2001 NATIONAL GEOGRAPHIC (www.nationalgeographic.com/topo).

SITE LOCATION MAP
SCALE: 1" = 1000'

SHEET INDEX

SHEET NO.	DRAWING NO.	TITLE
1	G-001	COVER SHEET
2	C-100	EXISTING CONDITIONS PLAN
3	C-101	TRANSPORTATION PLAN
4	C-102	SITE MANAGEMENT PLAN
5	C-103	PROPOSED STORM SEWER BYPASS
6	C-104	DEMOLITION AND PROTECTION PLAN
7	C-105	EXCAVATION PLAN
8	C-106	EXCAVATION SUPPORT PLAN
9	C-110	RESTORATION PLAN
10	C-200	EXCAVATION CROSS SECTIONS
11	C-210	EXCAVATION SUPPORT ELEVATIONS
12	C-300	EXCAVATION SUPPORT DETAILS
13	C-301	DETAILS (1 OF 3)
14	C-302	DETAILS (2 OF 3)
15	C-303	DETAILS (3 OF 3)

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GEI Consultants

GEI PROJECT NO. 102781

100% FOR BID

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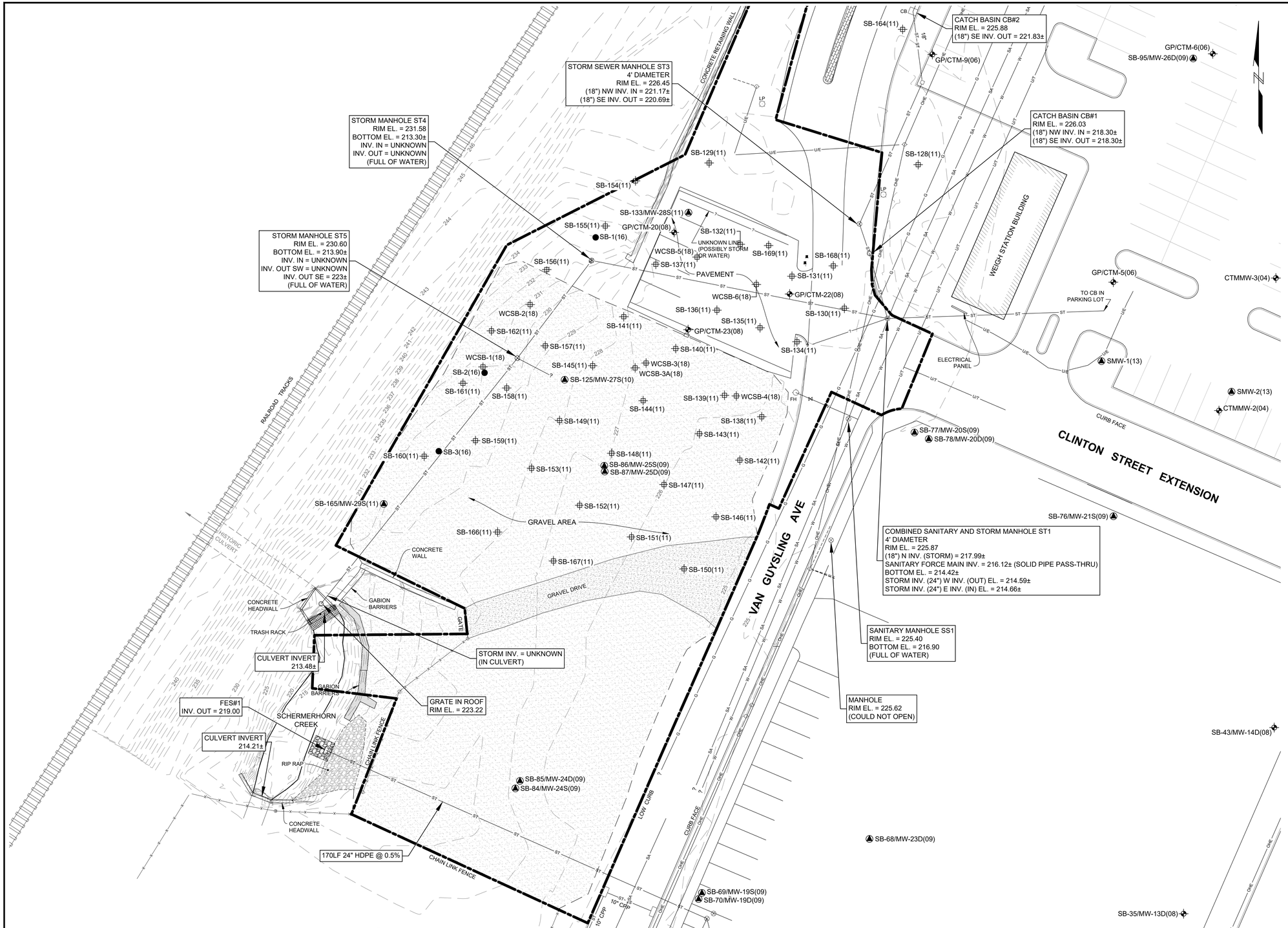
NO.	DATE	ISSUE/REVISION	APP
0	12/23/2021	100% FOR BID	DRK

STATE OF NEW YORK
DANIEL R. KOPCOW
077276
LICENSED PROFESSIONAL ENGINEER

DWG. NO.
G-001

SHEET NO.
1 OF 15

\\bos1v-fs02\ B:\Working\NATIONAL GRID\102781 Schenectady Clinton St MGP\Task 2 - OU2\100_CAD\Design\RD\102781_RD_G001_COVR.dwg - 12/6/2021



EXISTING CONDITIONS LEGEND:

SMW-1(13)	MONITORING WELL LOCATION (GEI - 2013)
SB-76/MW-21S(09) SB-125/MW-27S(10) SB-133/MW-28S(11)	SOIL BORING/MONITORING WELL LOCATION (GEI - 2009, 2010, 2011)
WCSB-1(18)	SOIL BORING (GEI - 2018)
SB-1(16)	PRE-DESIGN INVESTIGATION SOIL BORING (GEI - 2016)
SB-128(11)	SOIL BORING (GEI - 2011)
CTMMW-2(04) GP/CTM-5(06) GP/CTM-20(08)	SOIL BORING/MONITORING WELL LOCATION (CT MALE - 2004, 2006, 2008)
(04), (06), (08), (09), (10), (11), (13), (18)	YEAR INSTALLED
	PROJECT LIMITS
	APPROXIMATE TAX PARCEL BOUNDARY
	STRUCTURE
225	SURFACE CONTOUR
	POWER POLE
LP	LIGHT POLE
FH	FIRE HYDRANT
	MANHOLE
	CATCH BASIN
	SIGN
	VALVE
G	GAS LINE
OHE	OVERHEAD POWER POLE LINE
SA	SANITARY SEWER LINE
ST	STORM SEWER LINE
UE	UNDERGROUND ELECTRIC LINE
UT	UNDERGROUND TELEPHONE LINE
?	UNKNOWN LINE
W	WATER LINE

SOURCE NOTES:

1. DRAWING BASED ON *TOPOGRAPHICAL SURVEY: LANDS OF NIAGARA MOHAWK POWER CORPORATION (FORMER MGP SITE)*, BROADWAY, CITY OF SCHENECTADY - SCHENECTADY COUNTY, STATE OF NEW YORK, PREPARED BY DELTA ENGINEERS, ARCHITECTS, & LAND SURVEYORS, VERNON, NY, SCALE: 1" = 30', DATE: JANUARY 30, 2018.
2. ELEVATIONS SHOWN ARE IN FEET AND ARE REFERRED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. INVERT EL. ARE ESTIMATED ONLY. CONTRACTOR TO VERIFY IN FIELD.

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0 1"

If this scale bar does not measure 1" then drawing is not original scale.

NO.	DATE	ISSUE/REVISION	APP
0	12/23/2021	100% FOR BID	DRK

STATE OF NEW YORK · DANIEL R. KOPOOW · 077276 · LICENSED PROFESSIONAL ENGINEER

Designed:	CRP/PJS
Checked:	PJS/JSH
Drawn:	DTE/PHH
Submitted By:	DRK
P.E. Number:	077276-1

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nationalgrid

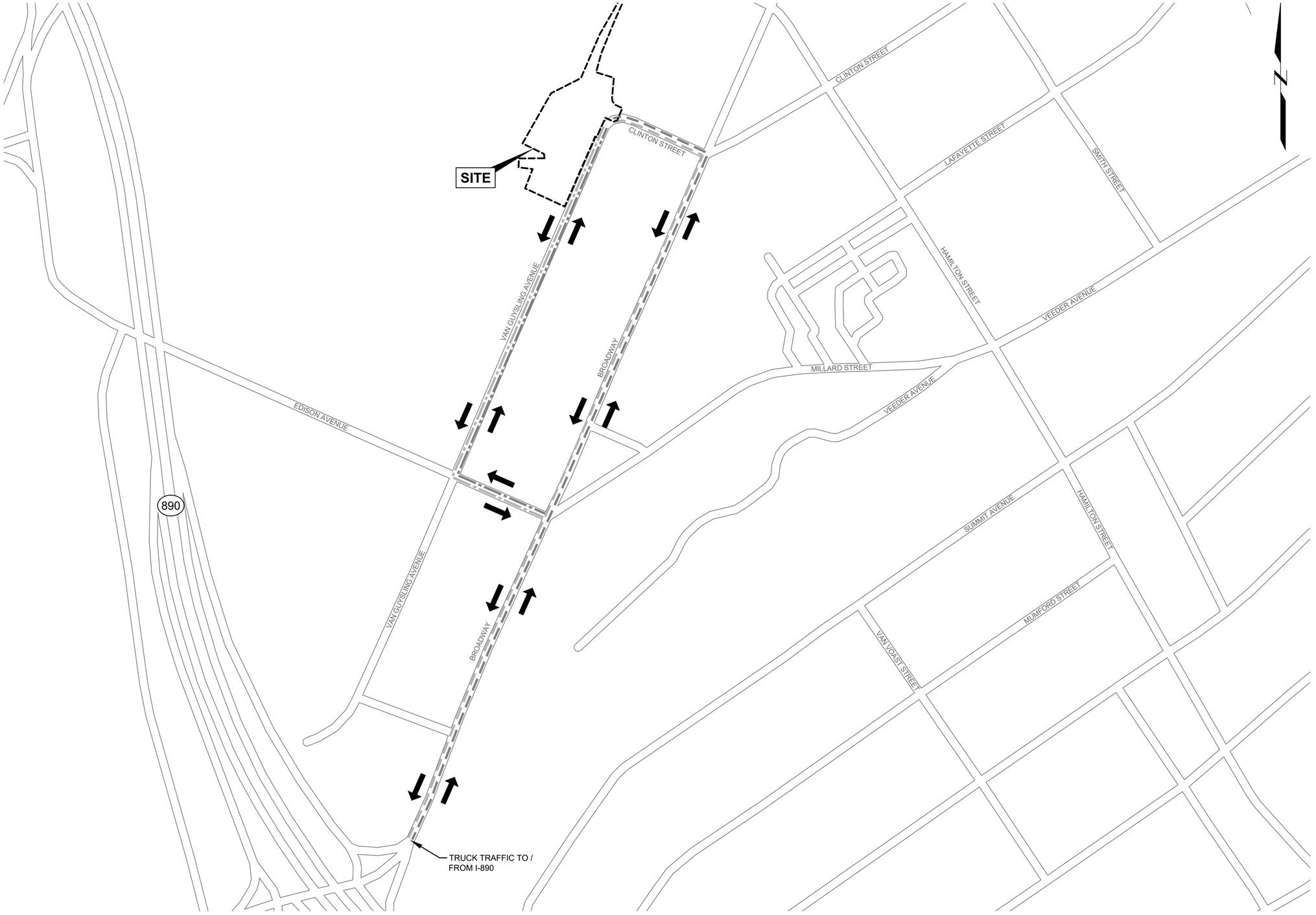
GEI Project 102781

OU2 Off-Site Impacts Remedial Design
Clinton Street Former MGP Site
Schenectady, New York

EXISTING CONDITIONS PLAN

DWG. NO. C-100

SHEET NO. 2 OF 15



TRANSPORTATION LEGEND:

- PROJECT LIMITS
- ENTERING PROJECT TRUCK ROUTE
- EXITING PROJECT TRUCK ROUTE
- ALTERNATIVE ENTERING PROJECT TRUCK ROUTE
- ALTERNATIVE EXITING PROJECT TRUCK ROUTE
- TRAFFIC FLOW DIRECTION
- 890 INTERSTATE ROUTE NUMBER

NOTES:

1. CONSTRUCTION VEHICLES TRANSPORTING MATERIALS TO OR FROM THE SITE MAY NOT TRAVEL ON LOCAL STREETS. CONSTRUCTION VEHICLES MAY ONLY USE EXPRESSWAYS AND THE PROJECT TRUCK ROUTE.
2. DO NOT QUEUE TRUCKS AND EQUIPMENT OFF-SITE, OR INHIBIT THE USE OF DRIVEWAYS AND PARKING SPACES FOR LOCAL BUSINESSES OR RESIDENCES.
3. MAINTAIN TRAFFIC FLOW AND TRAFFIC CONTROLS IN ACCORDANCE WITH TOWN/COUNTY/STATE REQUIREMENTS AND TO THE SATISFACTION OF NATIONAL GRID AND THE ENGINEER.
4. PROVIDE FLAG SERVICES AND OTHER TRAFFIC CONTROL MEASURES, AS NEEDED.
5. SWEEP TRUCK ROUTE A MINIMUM OF ONCE PER DAY OR AS DIRECTED BY NATIONAL GRID OR THE ENGINEER.
6. THE CONTRACTOR IS RESPONSIBLE FOR EVALUATING AND REMEDIATING WIRES, CLEARANCES, AND TURNING RADII ALONG THE PROPOSED TRUCK ROUTE.

SOURCE:

GIS: NYS STREETS- NEW YORK STATE OFFICE OF CYBER SECURITY (OCS), ACCESSED FROM NYS GIS CLEARINGHOUSE HTTP://WWW.NYSGIS.STATE.NY.US/INDEX.CFM

0 120 240
SCALE: 1" = 120'

100% FOR BID

Warning:

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0 1"
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NO.	DATE	ISSUE/REVISION	APP
0	12/23/2021	100% FOR BID	DRK

STATE OF NEW YORK · DANIEL R. KOPCON · 077276 · LICENSED PROFESSIONAL ENGINEER

Designed:	CRP/PJS
Checked:	PJS/JSH
Drawn:	DTE/PHH
Submitted By:	DRK
P.E. Number:	077276-1

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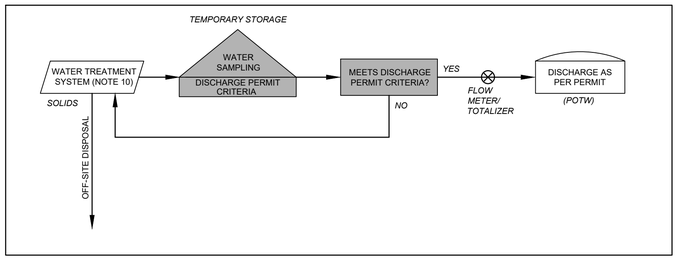
GEI Project 102781

OU2 Off-Site Impacts Remedial Design
Clinton Street Former MGP Site
Schenectady, New York

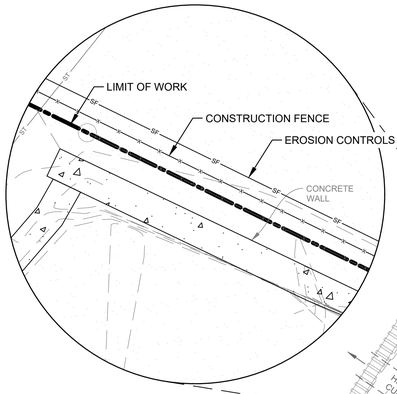
TRANSPORTATION PLAN

DWG. NO. C-101

SHEET NO. 3 OF 15



WATER TREATMENT SCHEMATIC



PARTIAL PLAN
SITE CONTROLS

0 5 10
SCALE: 1" = 5'

SITE MANAGEMENT LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- EXISTING SURVEY TO AS-BUILT UTILITY TRANSITION INFORMATION
- TEMPORARY FENCE
- SILT FENCE
- JERSEY BARRIERS
- SITE TRAILERS AND PARKING AREA
- LAYDOWN AREA
- ANIT-TRACKING PAD

NOTES:

1. AFFIX PRIVACY SCREEN TO THE TEMPORARY FENCE AND ANCHOR AS NEEDED TO PREVENT OVERTURNING UNDER HIGH WIND CONDITIONS.
2. THE LAYOUT SHOWN IS CONCEPTUAL. ACTUAL LAYOUT TO BE DETERMINED BY THE CONTRACTOR BASED ON THEIR PREFERRED MEANS AND METHODS.
3. STOCKPILE CLEAN EXCAVATED MATERIAL FOR REUSE.
4. DISCHARGE TREATED EFFLUENT TO THE APPROVED DISCHARGE POINT PER THE POTW PERMIT.
5. LIQUID WASTE INCLUDES NAPL, TAR, AND ANY TYPE OF VISIBLY CONTAMINATED MOBILE PRODUCT THAT CAN BE PUMPED.
6. ENGINEER MAY MODIFY DISPOSITION OF SOIL AND DEBRIS BASED ON OBSERVATIONS DURING EXCAVATION TO A MORE STRINGENT CLASSIFICATION (I.E. RECLASSIFY MATERIAL SCHEDULED FOR NON-HAZARDOUS LANDFILL DISPOSAL TO THERMAL DESORPTION).
7. STABILIZE, STAGE, AND CONTAINERIZE MGP LIQUID WASTE THAT IS NOT BOUND TO SOIL/MATERIAL MATRIX FOR OFF-SITE TRANSPORTATION. DO NOT DILUTE AND MIX WITH STOCKPILED SOIL.
8. USE LINED, WATERTIGHT, HAZARDOUS WASTE RATED CONTAINERS FOR OFF-SITE DISPOSAL OF MGP LIQUID WASTE.
9. EXCAVATED MATERIAL INCLUDES NATIVE SOILS, FILL SOILS, AND DEBRIS SUCH AS CONCRETE OR OTHER FOUNDATION MATERIALS AND ABANDONED PIPING.
10. MINIMUM WATER TREATMENT SYSTEM COMPONENTS INCLUDE:
    a. SEDIMENT FILTERS
    b. ORGANO-CLAY
    c. GRANULAR ACTIVATED CARBON
    d. ION-EXCHANGING RESIN
    e. pH BUFFERING
7. FINAL TREATMENT SYSTEM DESIGN, COMPONENTS, TREATMENT MEDIA, AND SIZING TO BE COMPLETED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER/CM.

0 30 60
SCALE: 1" = 30'

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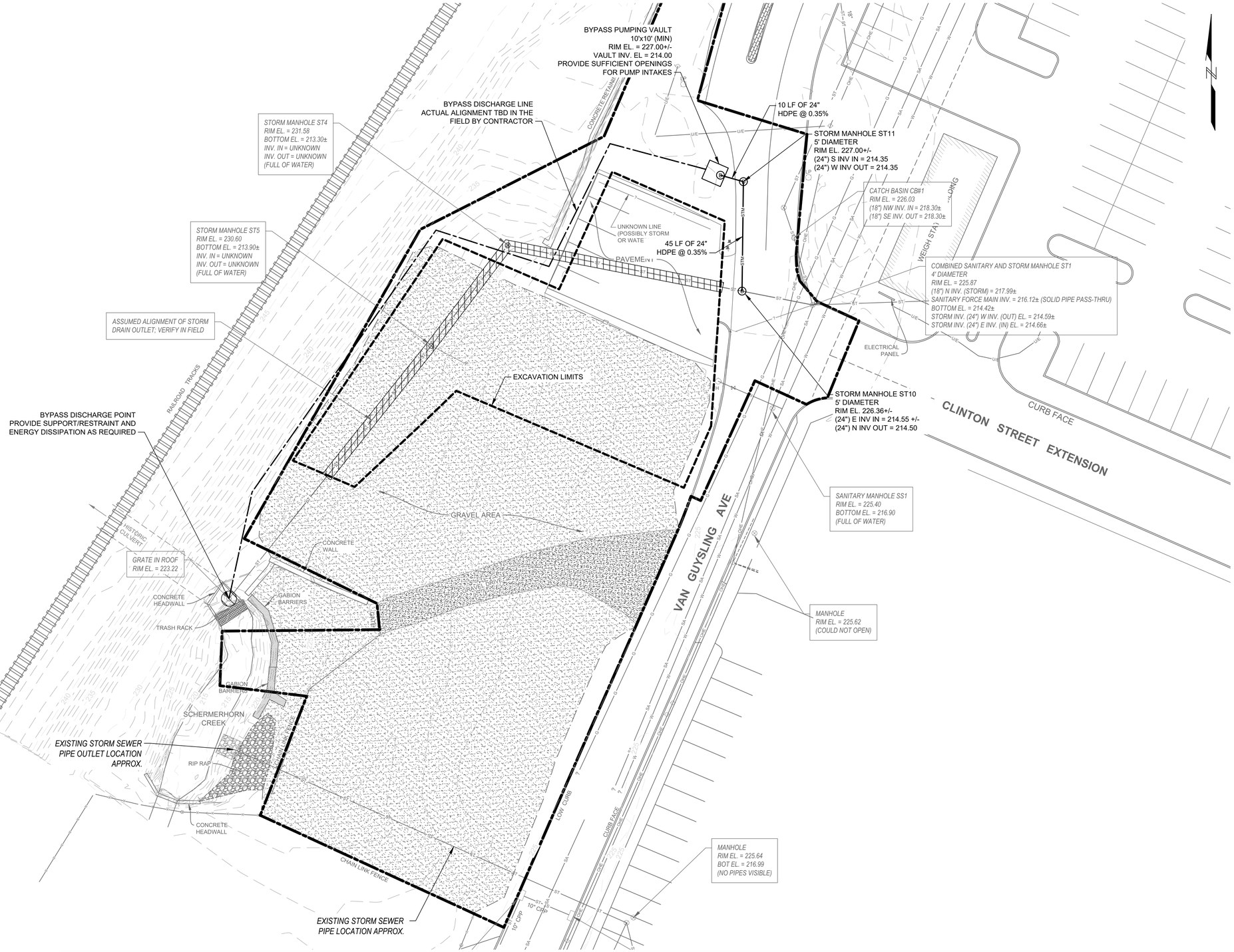
OU2 Off-Site Impacts Remedial Design
Clinton Street Former MGP Site
Schenectady, New York

DWG. NO. C-102

SITE MANAGEMENT PLAN

SHEET NO. 4 OF 15

\\bos1v-fs02\ B:\Working\NATIONAL GRID\102781 Schenectady Clinton St MGP\Task 2 - OU2\00_CAD\Design\RD\102781_RD_C102_SMP.dwg - 11/15/2021



LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- STRUCTURE TO BE REMOVED OR ABANDONED
- TEMPORARY BYPASS PIPING
- BYPASS STRUCTURE

NOTES:

1. CONTRACTOR TO VERIFY ALL STORM DRAIN MEASUREMENTS, ALIGNMENTS, ELEVATIONS, AND SIZES IN THE FIELD PRIOR TO PERFORMING INTRUSIVE ACTIVITIES. NOTIFY THE ENGINEER/CM IMMEDIATELY IF FIELD MEASUREMENTS DIFFER FROM WHAT IS SHOWN ON THE DRAWINGS.
2. COORDINATE ALL TRAFFIC CONTROL, LANE CLOSURES, AND UTILITY INSTALLATION WITH THE CITY OF SCHENECTADY, DIGSAFELY NY, AND THE APPROPRIATE UTILITY OWNERS.
3. PROVIDE TEMPORARY PIPE PLUGS AS NECESSARY TO DIRECT STORM WATER TO THE BYPASS ALIGNMENT.
4. ALL STRUCTURE AND PIPE SIZES SHOWN ARE MINIMUMS.
5. PROVIDE FRAMES, HATCHES, OR OTHER CONTROLLED OPENINGS IN THE VAULT AS NECESSARY TO ACCOMMODATE BYPASS SUCTION/INTAKE LINES.
6. PROVIDE BYPASS PUMPS WITH SUFFICIENT DISCHARGE CAPACITY AND PUMPING HEAD TO MANAGE THE ANTICIPATED BYPASS FLOWS.
7. EQUIP PUMPS WITH FLOAT CONTROLS AND ALARMS TO PROVIDE PROPER OPERATION AND NOTIFICATION.
8. MAINTAIN BACKUP PUMP AND POWER SOURCES ON-SITE AT ALL TIMES.
9. BYPASS PUMPS ARE REQUIRED TO BE CONTAINED WITHIN A SOUND-ATTENUATED ENCLOSURE RATED TO A MAXIMUM OF 70 DBA AT 30 FEET.
10. PUMP POWER/FUEL SOURCE TBD BY THE CONTRACTOR. IF DIESEL PUMPS ARE USED, PROVIDE SECONDARY CONTAINMENT FOR ALL FUEL TANKS.

0 20 40
SCALE: 1" = 20'

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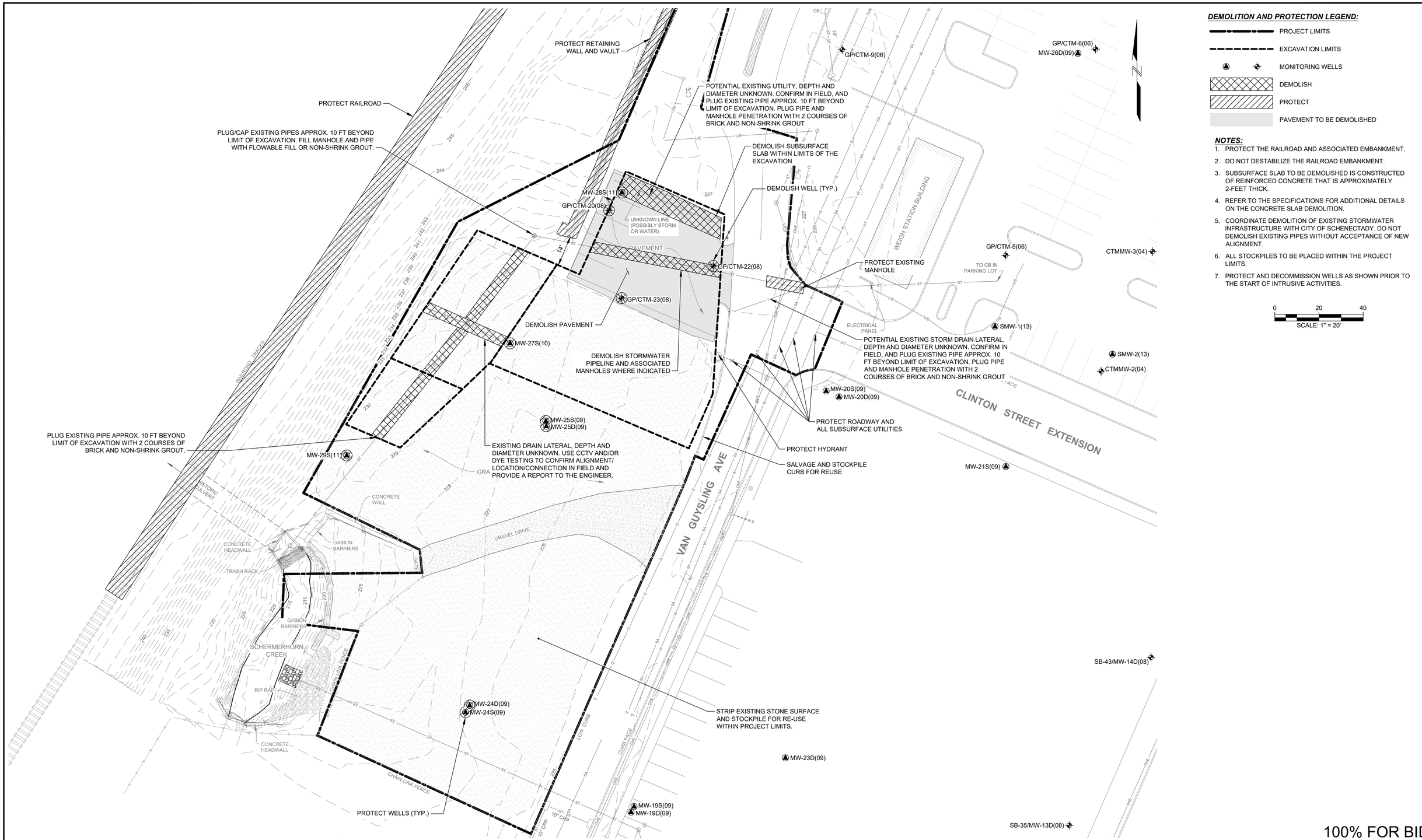
Schenectady, New York

DWG. NO. C-103

PROPOSED STORM SEWER BYPASS

SHEET NO. 5 OF 15



DEMOLITION AND PROTECTION LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- MONITORING WELLS
- DEMOLISH
- PROTECT
- PAVEMENT TO BE DEMOLISHED

NOTES:

1. PROTECT THE RAILROAD AND ASSOCIATED EMBANKMENT.
2. DO NOT DESTABILIZE THE RAILROAD EMBANKMENT.
3. SUBSURFACE SLAB TO BE DEMOLISHED IS CONSTRUCTED OF REINFORCED CONCRETE THAT IS APPROXIMATELY 2-FEET THICK.
4. REFER TO THE SPECIFICATIONS FOR ADDITIONAL DETAILS ON THE CONCRETE SLAB DEMOLITION.
5. COORDINATE DEMOLITION OF EXISTING STORMWATER INFRASTRUCTURE WITH CITY OF SCHENECTADY. DO NOT DEMOLISH EXISTING PIPES WITHOUT ACCEPTANCE OF NEW ALIGNMENT.
6. ALL STOCKPILES TO BE PLACED WITHIN THE PROJECT LIMITS.
7. PROTECT AND DECOMMISSION WELLS AS SHOWN PRIOR TO THE START OF INTRUSIVE ACTIVITIES.

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Schenectady, New York

DWG. NO. C-104

DEMOLITION AND PROTECTION PLAN

SHEET NO. 6 OF 15

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EXCAVATION LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- LIMITS OF PREVIOUS REMEDIAL EXCAVATION WORK PERFORMED BY OTHERS (CITY OF SCHENECTADY, 2016)
- EXISTING SURVEY TO AS-BUILT UTILITY TRANSITION INFORMATION
- EL 216 FEET — TARGET EXCAVATION ELEVATION

NOTES:

1. PERFORM THE EXCAVATION TO THE TARGET DEPTHS SHOWN. DO NOT PERFORM OVER-EXCAVATION WORK WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
2. MAINTAIN OFFSETS FROM THE RETAINING WALL AS SHOWN.
3. REMOVE STONE FILL PLACED BY OTHERS WITHIN THE PROJECT LIMITS AND STOCKPILE ON-SITE FOR RE-USE.
4. STOCKPILE EXCAVATED MATERIAL FROM ABOVE DEMARCATION LAYER FOR POTENTIAL REUSE AS BACKFILL, AS DIRECTED BY THE ENGINEER.
5. CONFIRMATION SAMPLES REQUIRED FOR EVERY 900 SF OF BOTTOM AREA. SUBMIT AS-BUILT LOCATION OF EXCAVATION SUPPORT AND PROPOSED LOCATIONS FOR CONFIRMATION SAMPLES BASED ON THE PROPOSED EXCAVATION SEQUENCE. A MINIMUM OF 10 SAMPLES ARE REQUIRED.

LIMITS OF EXCAVATION WORKING POINTS		
ID	NORTHING	EASTING
WP1	1449236.55	640711.89
WP2	1449266.55	640732.21
WP3	1449324.41	640771.28
WP4	1449304.51	640817.44
WP5	1449351.08	640838.53
WP6	1449331.58	640883.13
WP7	1449225.76	640866.93
WP8	1449264.20	640776.70
WP9	1449252.52	640764.54
WP10	1449226.07	640736.36
WP11	1449250.24	640877.72

0 10 20
SCALE: 1" = 10'

PROPOSED EXCAVATION SEQUENCE:

1. STRIP EXISTING STONE COVER AND STOCKPILE AS CLEAN MATERIAL SUITABLE FOR RE-USE.
2. INSTALL SOE. RETAIN ASPHALT SURFACE IN CELL 3 FOR STOCKPILE AREA.
3. EXCAVATE CELL 1 NON-IMPACTED REUSE MATERIAL AND STOCKPILE ON ASPHALT OR POLY SHEETING. KEEP STOCKPILES A MINIMUM OF 1.5D (D = TOTAL DEPTH OF EXCAVATION) FROM ALL OPEN EXCAVATIONS.
4. EXCAVATE MGP-IMPACTED MATERIAL FROM CELL 1, INCLUDING ADDITIONAL SLOPED AREA ALONG EASTERN SIDE FOR OFFSITE T&D.
5. BACKFILL CELL 1 WITH A PORTION OF THE STOCKPILED STONE AND NON-IMPACTED REUSE MATERIAL. REMOVE INTERNAL BRACING ONCE BACKFILL IS WITHIN TWO FEET OF BRACE ELEVATION. USE NON-WOVEN GEOTEXTILE SEPARATION LAYERS BETWEEN STONE AND NATIVE SOIL OR GRANULAR BACKFILL (RE-USE OR IMPORTED). PLACE A MINIMUM OF 4 FEET OF IMPORTED CLEAN FILL BEFORE PLACING SURFACE RESTORATION MATERIALS.
6. REMOVE ASPHALT IN CELL 2 FOR OFFSITE DISPOSAL OR RECYCLING. EXCAVATE UNDERLYING SUBBASE COURSE (IF PRESENT) AND STOCKPILE ON ASPHALT OR POLY SHEETING.
7. EXCAVATE CELL 2 NON-IMPACTED REUSE MATERIAL FILL AND STOCKPILE ON ASPHALT OR POLY SHEETING.
8. EXCAVATE CELL 2 MGP-IMPACTED MATERIAL FROM CELL 2 FOR OFFSITE T&D.
9. BACKFILL CELL 2 WITH A PORTION OF THE STOCKPILED STONE AND NON-IMPACTED REUSE MATERIAL. REMOVE INTERNAL BRACING ONCE BACKFILL IS WITHIN TWO FEET OF BRACE ELEVATION. USE NON-WOVEN GEOTEXTILE SEPARATION LAYERS BETWEEN STONE AND NATIVE SOIL OR GRANULAR BACKFILL (RE-USE OR IMPORTED). PLACE A MINIMUM OF 4 FEET OF IMPORTED CLEAN FILL BEFORE PLACING SURFACE RESTORATION MATERIALS.
10. EXCAVATE REMAINING ASPHALT IN CELL 3 FOR OFFSITE DISPOSAL OR RECYCLING. EXCAVATE UNDERLYING SUBBASE COURSE AND STOCKPILE ON POLY SHEETING.
11. EXCAVATE CELL 3 MGP-IMPACTED MATERIAL FOR OFFSITE T&D.
12. BACKFILL CELL 3 WITH STOCKPILED SUBBASE COURSE PLUS A PORTION OF THE STOCKPILED STONE (261 CY). REMOVE INTERNAL BRACING ONCE BACKFILL IS WITHIN TWO FEET OF BRACE ELEVATION. USE NON-WOVEN GEOTEXTILE SEPARATION LAYERS BETWEEN STONE AND NATIVE SOIL OR GRANULAR BACKFILL (RE-USE OR IMPORTED). PLACE A MINIMUM OF 4 FEET OF IMPORTED CLEAN FILL BEFORE PLACING SURFACE RESTORATION MATERIALS.

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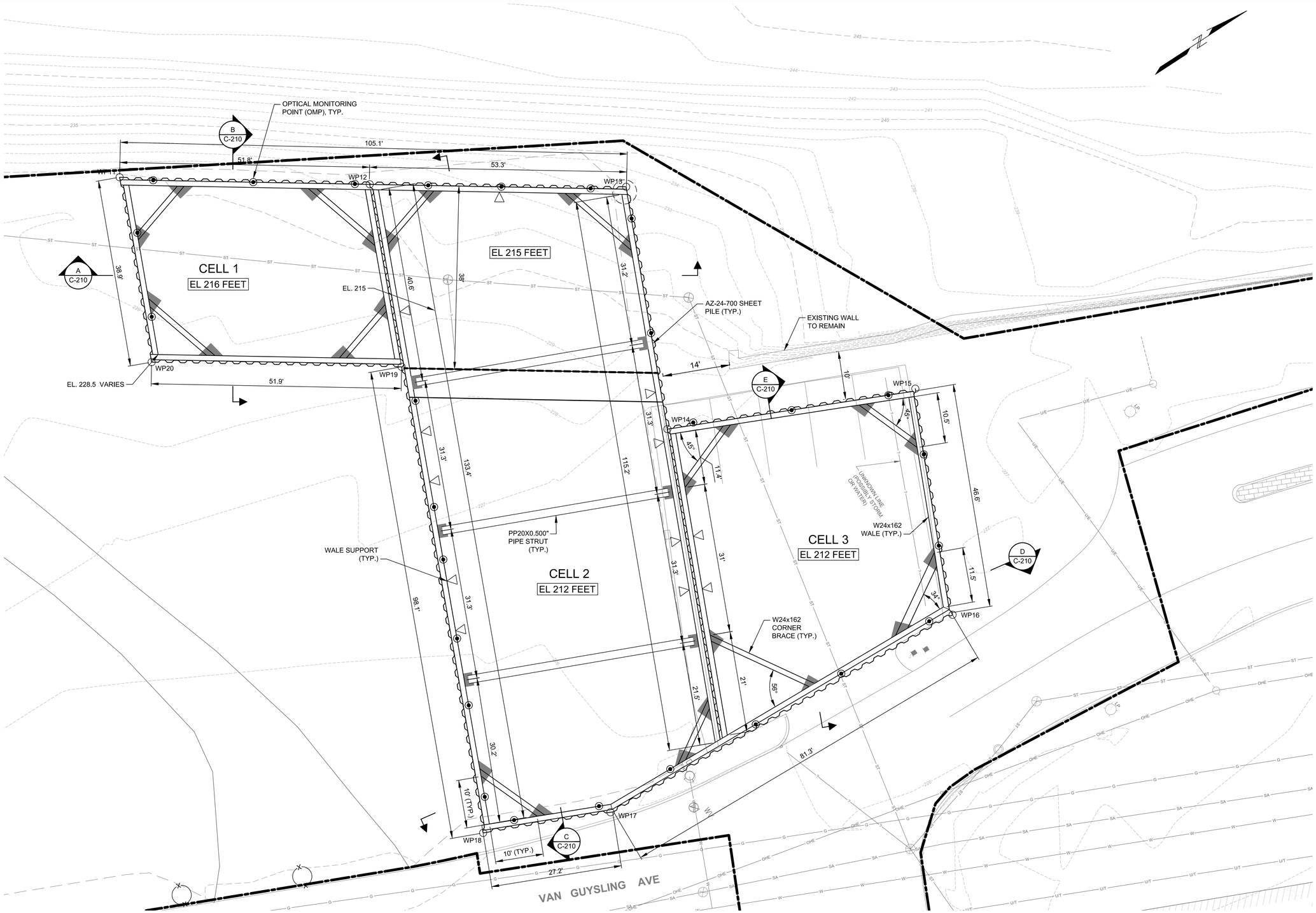
OU2 Off-Site Impacts Remedial Design
Clinton Street Former MGP Site
Schenectady, New York

EXCAVATION PLAN

DWG. NO. C-105

SHEET NO. 7 OF 15



EXCAVATION SUPPORT LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- AZ47-700 SHEET PILE WALL
- EL 216 FEET — TARGET EXCAVATION ELEVATION
- EXISTING SURVEY TO AS-BUILT UTILITY TRANSITION INFORMATION
- OPTICAL MONITORING POINT
- WALE SUPPORT
- PIPE PLATE @ STRUT
- BEAM SEAT

NOTES:

1. SEQUENCE EXCAVATION TO MAXIMIZE REUSE OF BACKFILL. OFF-SITE DISPOSAL OF STONE SURFACE AND IMPORTED BACKFILL ABOVE THE DEMARCATION LAYER FROM THE 2016 REMEDIATION WILL NOT BE PERMITTED.
2. REFER TO SHORING SPECIFICATION 31 41 00 FOR NOTES ON CONSTRUCTION SEQUENCE.
3. DIMENSIONS SHOWN ON PLAN ARE FOR REFERENCE ONLY. VERIFY ALL MEASUREMENTS IN THE FIELD AND ADJUST MEMBER LENGTHS ACCORDINGLY.
4. PERFORM SLOPING/BENCHING TO TRANSITION BETWEEN EXCAVATION GRADES PER OSHA REQUIREMENTS.
5. INSTALL A WALE SUPPORT AT EACH WALE TO STRUT CONNECTION AT THE LOCATIONS SHOWN.
6. EXTEND SHEET PILES ABOVE EXISTING GRADE OR PROVIDE OTHER MEANS OF FALL PROTECTION IN ACCORDANCE WITH OSHA REQUIREMENTS.
7. USE COMPLETE JOINT PENETRATION WELDS TO JOIN WALE BEAMS, AS NEEDED. ALTERNATIVELY THE CONTRACTOR MAY SUBMIT A SPLICE DESIGN TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.
8. INSTALL INTERNAL BRACING AT EL. 226.
9. EXTEND SHEET PILES TO A TIP ELEVATION OF 187.0 FT(NAVD 88) OR LOWER.
10. INSTALL OPTICAL MONITORING POINTS (OMPs) ON THE SHEET PILES WITHIN 1 FT OF EXISTING GRADE. MAXIMUM SPACING OF OMPs IS 25 FT O.C. WITH A MINIMUM OF 2 POINTS PER WALL.
11. COLLECT BASELINE READINGS BEFORE COMMENCING EXCAVATION AND COLLECT ROUTINE READINGS A MINIMUM OF 2 TIMES/WEEK UNTIL BACKFILL HAS BEEN PLACED TO WITHIN 2 FT OF EXISTING GRADE. READINGS SHALL BE PERFORMED BY A PLS REGISTERED IN NEW YORK STATE AND REPORTED TO THE ENGINEER ON A WEEKLY BASIS.
12. REPLACE OMPs IMMEDIATELY IF THEY ARE DAMAGED OR DESTROYED.

SHEET PILE WORKING POINTS		
ID	NORTHING	EASTING
WP11	1449236.55	640711.89
WP12	1449279.26	640741.36
WP13	1449323.59	640770.77
WP14	1449303.40	640817.54
WP15	1449351.08	640838.53
WP16	1449332.04	640882.04
WP17	1449250.24	640877.72
WP18	1449225.76	640866.93
WP19	1449264.20	640776.70
WP20	1449221.24	640747.65

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OU2 Off-Site Impacts Remedial Design
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EXCAVATION SUPPORT PLAN

DWG. NO. C-106

SHEET NO. 8 OF 15

RESTORATION LEGEND:

- PROJECT LIMITS
- EXCAVATION LIMITS
- PROPOSED STORM DRAIN ALIGNMENT
- PROPOSED STORM DRAIN STRUCTURE
- TEMPORARY BYPASS PIPING
- TEMPORARY BYPASS STRUCTURES
- RESTORATION CONTOUR
- EXISTING SURVEY TO AS-BUILT UTILITY TRANSITION INFORMATION
- PAVEMENT RESTORATION
- STONE SURFACE RESTORATION

NOTES:

1. GRANULAR MATERIAL OUTSIDE OF THE EXCAVATION AREA AND BELOW THE EXISTING STONE COVER THAT IS REQUIRED TO BE CUT FOR FINAL GRADING AND RESTORATION IS TO BE STOCKPILED, SAMPLED AND TESTED FOR OFF-SITE DISPOSAL.
2. SOIL EXCAVATED FROM OUTSIDE OR BELOW THE REMEDIAL EXCAVATION FOR STORM DRAIN INSTALLATION IS TO BE STOCKPILED, SAMPLED, AND TESTED FOR OFF-SITE DISPOSAL.
3. CONSTRUCTION SEQUENCE TO INSTALL PROPOSED STORM DRAIN ALIGNMENT TBD BY CONTRACTOR.
4. MAINTAIN BYPASS PUMPING UNTIL THE PROPOSED STORM DRAIN ALIGNMENT HAS BEEN COMPLETED AND ACCEPTED BY THE CM AND CITY OF SCHENECTADY.
5. PROVIDE ALL NECESSARY PLUGS, LOCALIZED DEWATERING AND ALL TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS DURING THE STORM DRAIN INSTALLATION WORK.
6. ALL TEMPORARY SHORING AND ANY PENETRATIONS THROUGH THE PERIMETER SOE FOR THE UTILITY INSTALLATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
7. IF STORM DRAIN INSTALLATION OCCURS DURING/AFTER RESTORATION, RESTORE SURFACE ABOVE NEW STORM DRAIN ALIGNMENT WITH COMPACTED GRAVEL AND CRUSHER RUN AS SHOWN IN THE STONE SURFACE RESTORATION DETAIL.
8. CONNECT PROPOSED STORM DRAIN ALIGNMENT TO EXISTING INFRASTRUCTURE. FINAL TIE-IN LOCATION TBD IN THE FIELD.
9. COORDINATE ALL UTILITY INSTALLATION WORK, TRAFFIC CONTROL, STREET CLOSURES, AND ALL OTHER ASSOCIATED WITH WITH THE CITY OF SCHENECTADY AND THE APPROPRIATE UTILITY OWNER.
10. RESTORE OTHER DISTURBED SURFACES BEYOND WHAT IS SHOWN HERE TO THEIR ORIGINAL CONDITION.

0 20 40
SCALE: 1" = 20'

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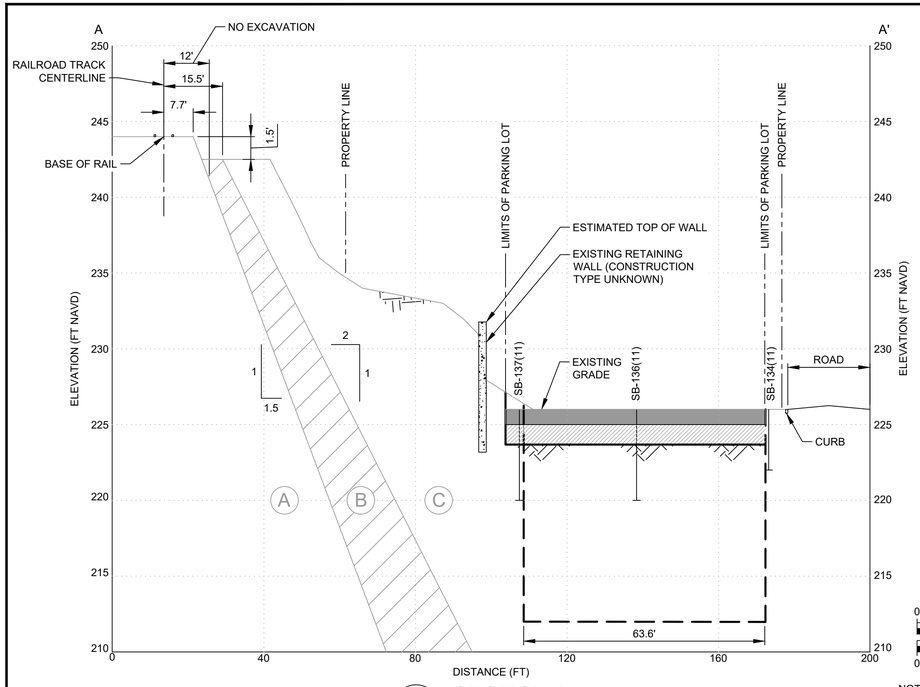
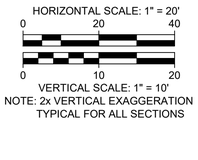
DWG. NO. C-110

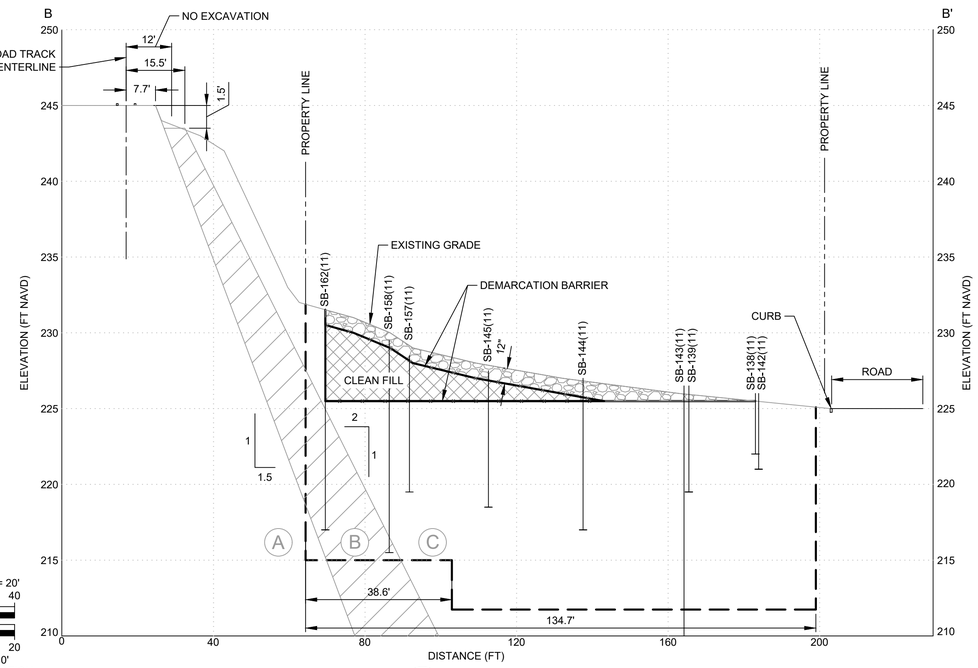
RESTORATION PLAN

SHEET NO. 9 OF 15



A C-105 SECTION A





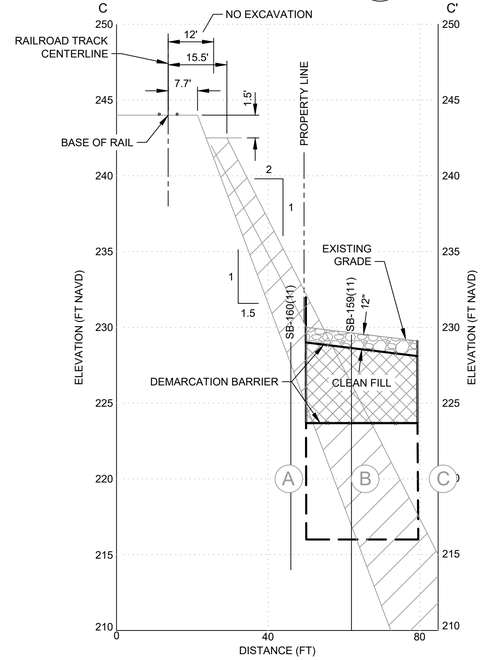
B C-105 SECTION B

EXCAVATION SECTION LEGEND:

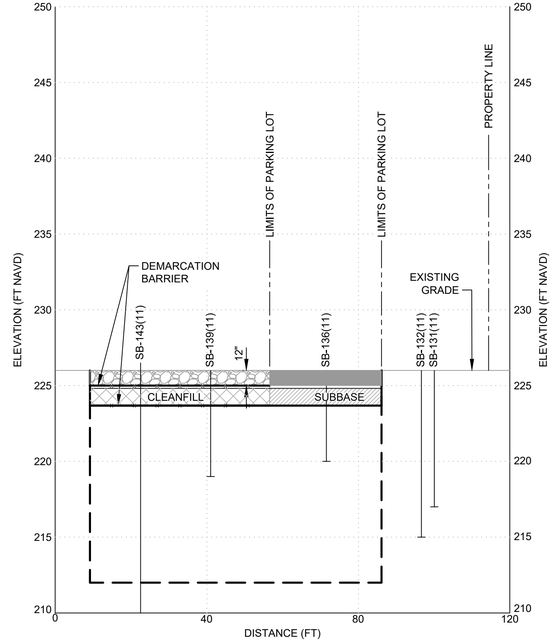
- EXISTING GRADE
- EXCAVATION EXTENTS
- CLEAN FILL EXTENT
- DEMARCATION BARRIER
- EXISTING GRAVEL COVER - STOCKPILE FOR REUSE
- EXISTING CLEAN FILL - STOCKPILE FOR REUSE
- PAVEMENT WITH SUBBASE MATERIAL
- (A) SHORING MUST BE DESIGNED FOR RAILROAD LIVE LOAD SURCHARGE IN ADDITION TO OSHA STANDARD LOADS FOR EXCAVATION IN ZONE A. APPLICABLE RAILROAD LIVE LOAD: COOPER E80
- (B) ONLY VERTICAL SHORING WILL BE PERMITTED FOR EXCAVATION IN THIS ZONE (NO SLOPING CUTS) SHORING TO COMPLY WITH OSHA REQUIREMENTS
- (C) SHORING TO COMPLY WITH OSHA REQUIREMENTS

NOTES:

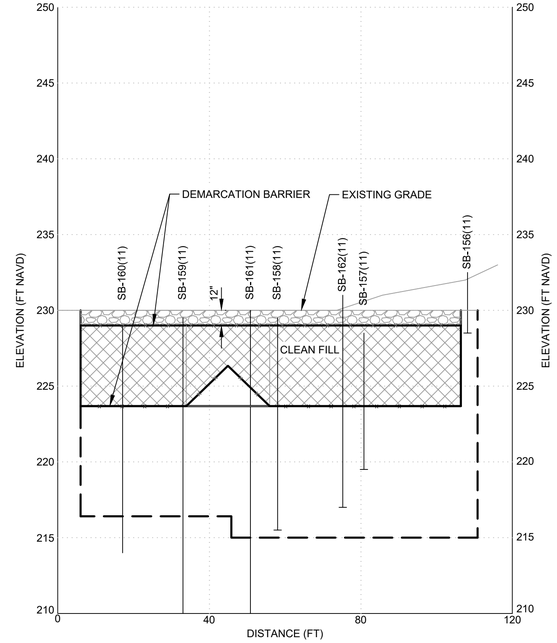
1. THE INFORMATION PRESENTED IN THE CROSS SECTIONS IS BASED ON INTERPOLATION BETWEEN SUBSURFACE INVESTIGATIONS. ACTUAL CONDITIONS OBSERVED IN THE FIELD MAY VARY.
2. SHORING REQUIREMENTS BASED ON THE 2004 UNION PACIFIC AND BURLINGTON NORTHERN RAILWAY GUIDELINES FOR TEMPORARY SHORING.



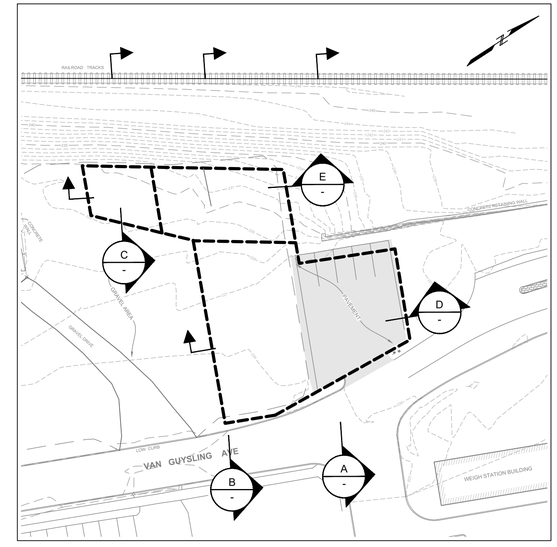
C C-105 SECTION C



D C-105 SECTION D



E C-105 SECTION E



CROSS SECTION KEY

PLAN

0 40 80

SCALE: 1" = 40'

100% FOR BID

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STATE OF NEW YORK · DANIEL R. KOPCOW · 077276 · LICENSED PROFESSIONAL ENGINEER

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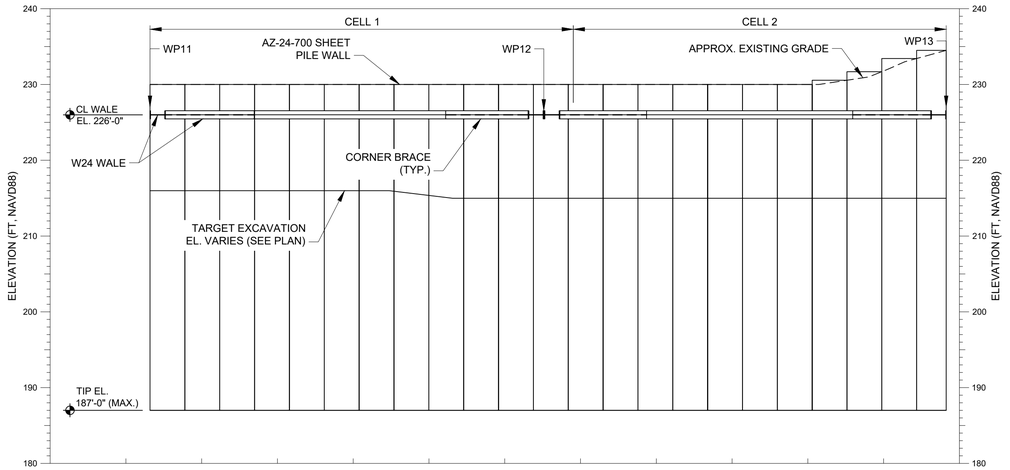
Clinton Street Former MGP Site
Schenectady, New York

EXCAVATION CROSS SECTIONS

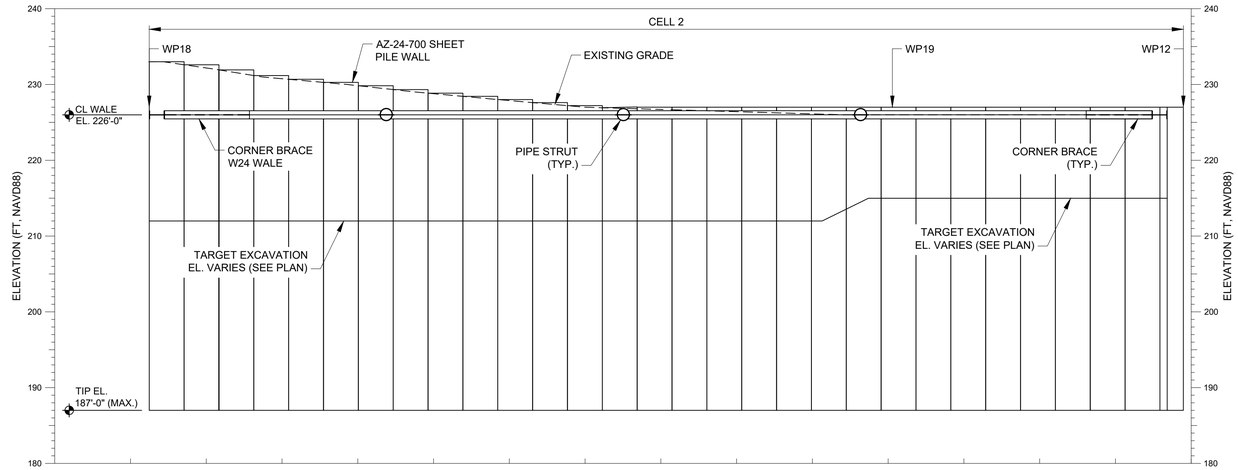
DWG. NO. C-200

SHEET NO. 10 OF 15

\\bos1v-fs02\ B:\Working\NATIONAL GRID\102781 Schenectady Clinton St MGP\Task 2 - OU2\00_CAD\Design\RD\102781_RD_C200_XSEC.dwg - 11/18/2021

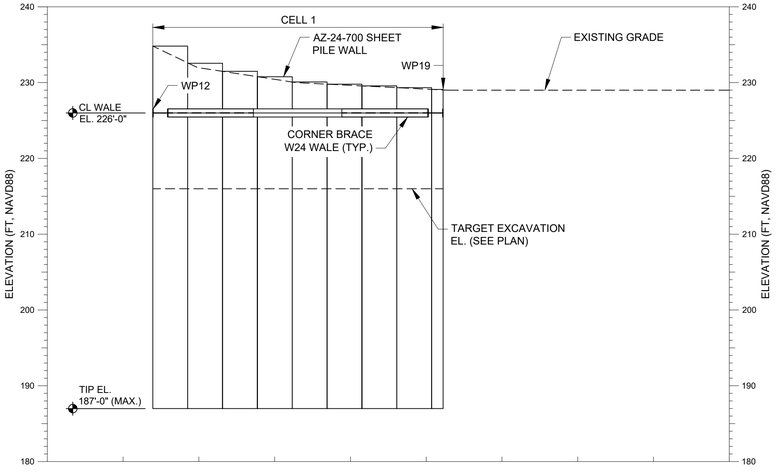


A C-106 ELEVATION A

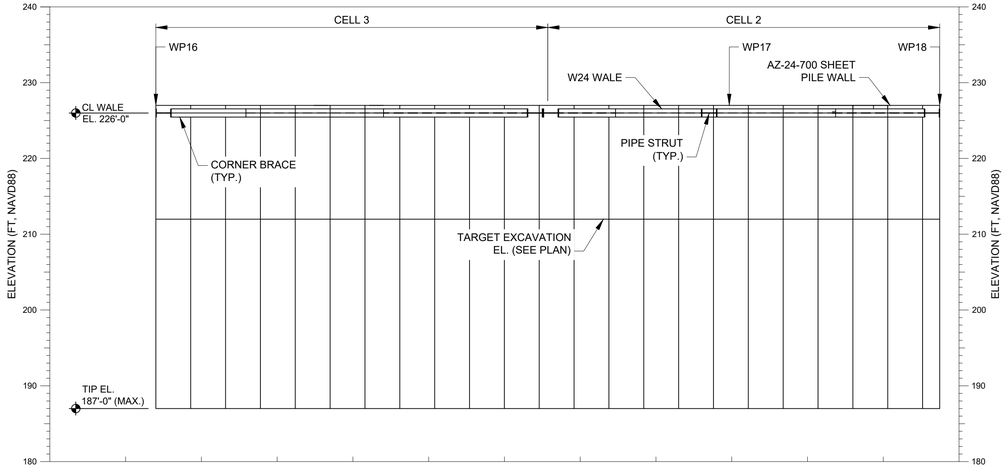


C C-106 ELEVATION C

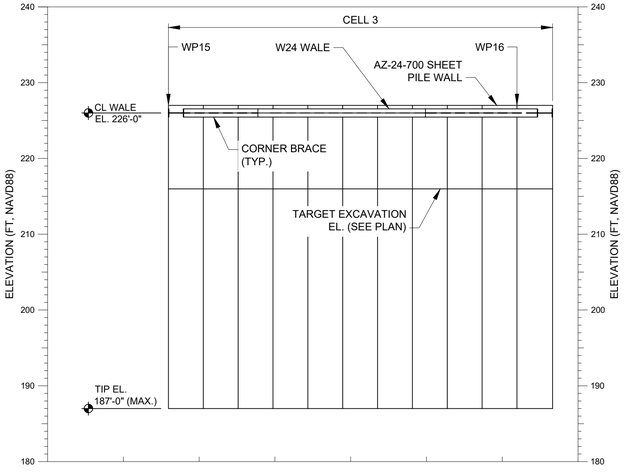
HORIZONTAL SCALE: 1" = 10'
0 10 20
VERTICAL SCALE: 1" = 10'
NO VERTICAL EXAGGERATION



B C-106 ELEVATION B



D C-106 ELEVATION D



E C-106 ELEVATION E

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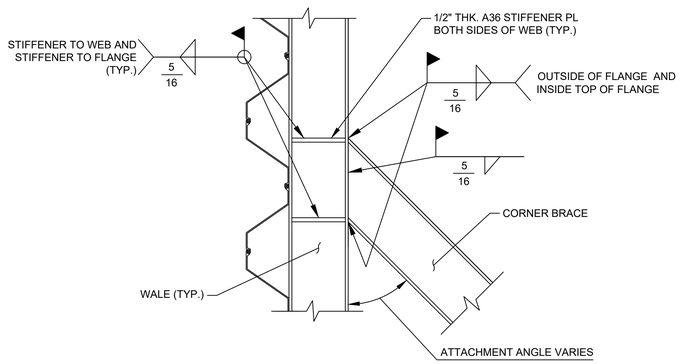
EXCAVATION SUPPORT ELEVATIONS

DWG. NO. C-210

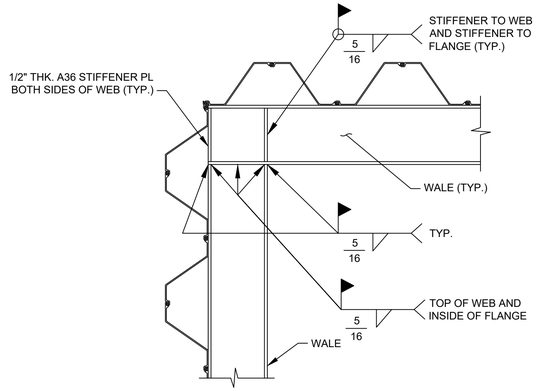
SHEET NO. 11 OF 15

\\bos1v-fs02\ B:\Working\NATIONAL GRID\102781 Schenectady Clinton St MGP\Task 2 - OU2\00_CAD\Design\RD\102781_RD_C210_EXEL.dwg - 9/2/2021



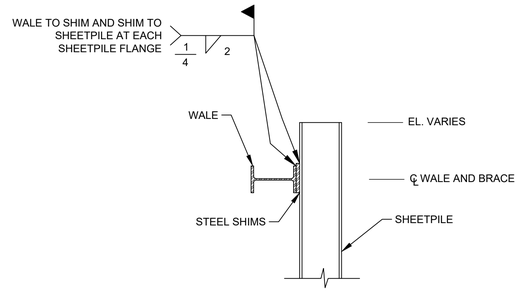
TYPICAL DETAIL
CORNER BRACE TO WALE CONNECTION

0 2 4
SCALE: 3/8" = 1'-0"



TYPICAL DETAIL
WALE CORNER

0 2 4
SCALE: 3/8" = 1'-0"



TYPICAL DETAIL
WALE TO SHEETPILE CONNECTION

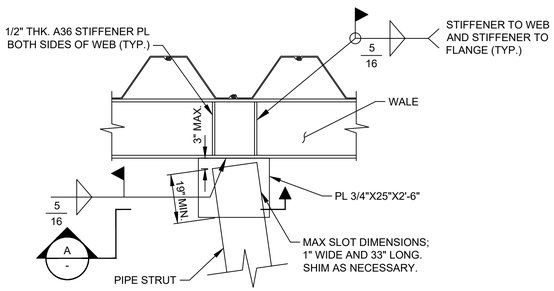
0 2 4
SCALE: 3/8" = 1'-0"

NOTES:

A. ALIGN WEBS OF MEMBERS.

B. INSTALL STEEL SHIMS AT ALL CONNECTIONS TO PROVIDE TIGHT FIT AND EVEN BEARING.

C. STIFFENER PLATES TO BE FLUSH WITH WALE FLANGE AND WEB; CHAMFER CORNERS AS NECESSARY.



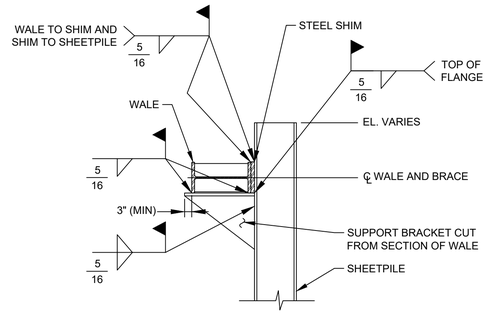
TYPICAL DETAIL
STRUT TO WALE CONNECTION

0 2 4
SCALE: 3/8" = 1'-0"

NOTES:

A. ALIGN CONNECTION PLATE WITH WEB OF WALE.

B. ALIGN STIFFENER PLATES WITH OD OF STRUT.



TYPICAL DETAIL
WALE SUPPORT

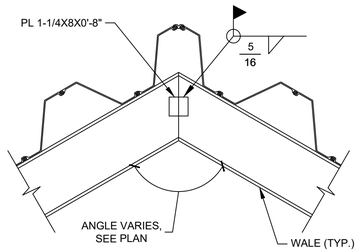
0 2 4
SCALE: 3/8" = 1'-0"

NOTES:

A. PROVIDE WALE SUPPORT AT EACH STRUT AND BRACE CONNECTION.

B. STRUT/BRACE OMITTED FOR CLARITY.

C. PROVIDE STEEL SHIMS AND FULL BEARING ALONG THE ENTIRE FLANGE WIDTH OF THE WALE SUPPORT.

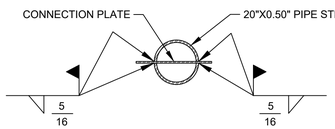


TYPICAL DETAIL
WALE CORNER SHEAR CONNECTION

0 2 4
SCALE: 3/8" = 1'-0"

NOTE:

A. CENTER PLATE ON JOINT.



A
-

STRUT TO WALE CONNECTION

0 2 4
SCALE: 3/8" = 1'-0"

100% FOR BID

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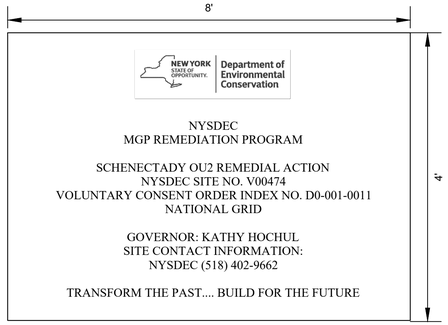
EXCAVATION SUPPORT DETAILS

DWG. NO. C-300

SHEET NO. 12 OF 15



TYPICAL DETAIL
NYSDEC SIGN

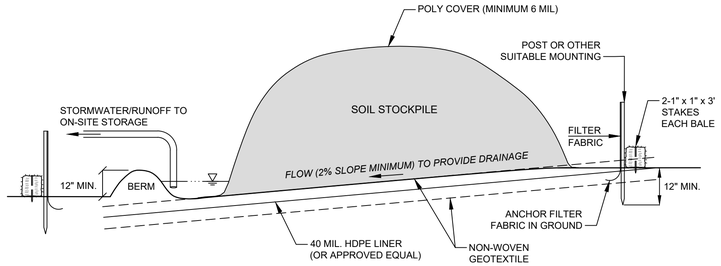
SCALE: N.T.S.

SIGN NOTES:

1. SIZE: HORIZONTAL FORMAT 96" BY 48" HIGH
2. DEC LOGO
   TEXT: PMS 355
   LOGO: PMS 301 BLUE
   PMS 355 GREEN
3. TEXT: CASLON 540

MGP REMEDIATION PROGRAM	PMS 301
SITE NAME, SITE NUMBER, PARTY PERFORMING	PMS 355
NAME OF GOVERNOR	PMS 301
TRANSFORM THE PAST.... BUILD FOR THE FUTURE	PMS 355

4. CENTER EACH LINE OF COPY WITH SMALL CAPS AND INITIAL CAPS
5. 96" WIDE BY 48" HIGH ALUMINUM BLANKS WILL BE COVERED WITH VINYL SHEETING TO ACHIEVE BACKGROUND COLOR. COPY LOGO WILL BE SILK SCREENED ON THIS SURFACE.

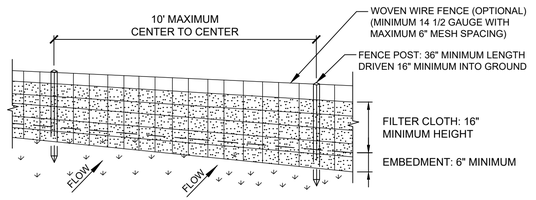


TYPICAL DETAIL
SOIL STOCKPILE PAD

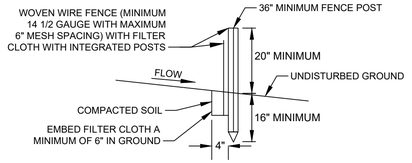
SCALE: N.T.S.

PAD NOTES:

1. SOIL STOCKPILE PAD DESIGN IS CONCEPTUAL. FINAL DESIGN WILL MEET THE INTENT OF THE CONCEPT AND BE APPROVED BY THE CONSTRUCTION MANAGER.



PERSPECTIVE VIEW



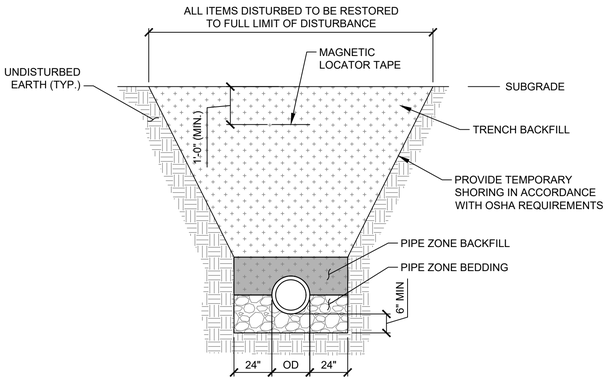
SECTION VIEW

TYPICAL DETAIL
SILT FENCE

SCALE: N.T.S.

WOVEN SILT FENCE NOTES:

1. FASTEN WOVEN WIRE FENCE SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FASTEN FILTER CLOTH SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24-INCHES AT TOP AND MID-SECTION. FENCE SHALL BE WOVEN WIRE, 14 1/2 GAUGE, 6-INCH MAXIMUM MESH OPENING.
3. OVERLAP ADJACENT FILTER CLOTH SIX INCHES AND FOLD. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. PERFORM MAINTENANCE AS NEEDED AND REMOVE MATERIAL WHEN "BULGES" DEVELOP.
6. FILTER FABRIC WITH INTEGRATED STAKES MAY BE USED INSTEAD OF WIRE FENCE.

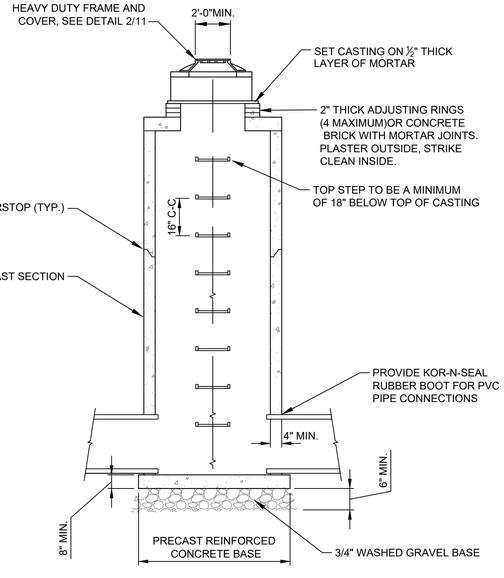


TYPICAL DETAIL
TRENCH EXCAVATION AND BACKFILL

SCALE: N.T.S.

NOTES:

1. PIPE ZONE BEDDING: NYSDOT NO. 2 CRUSHED STONE PIPE ZONE BACKFILL. NYSDOT GRAVEL FILL TRENCH BACKFILL: IMPORTED GRANULAR FILL.



TYPICAL DETAIL
DRAINAGE MANHOLE

SCALE: N.T.S.

NOTES:

1. ALL SURFACES TO BE MACHINE FINISHED.
2. FURNISH A HEAVY DUTY FRAME AND GRATE CONSTRUCTED TO ACCOMMODATE A FULL TRAFFIC LOADING.
3. STORM COVER MUST HAVE "STORM" OR "DRAIN" EMBOSSED ON IT.
4. MINIMUM INSIDE DIMENSION: 5'-0".

100% FOR BID

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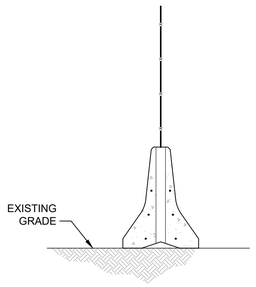
DWG. NO. C-301

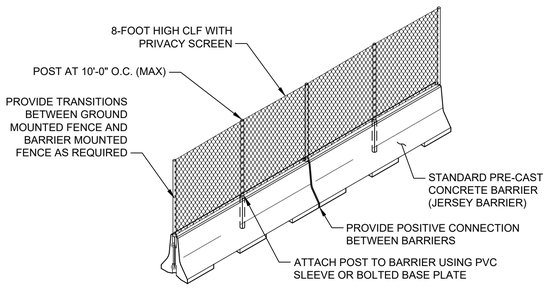
DETAILS (1 OF 3)

SHEET NO. 13 OF 15



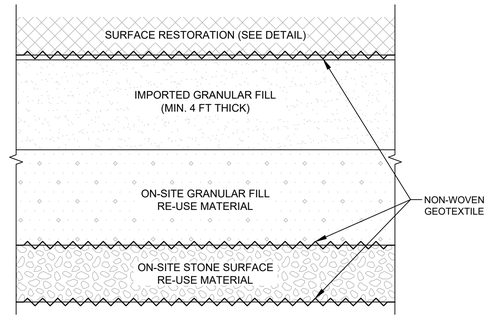
TYPICAL SECTION
BARRIER AND FENCE

SCALE: N.T.S.



TYPICAL DETAIL
BARRIER AND FENCE

SCALE: N.T.S.

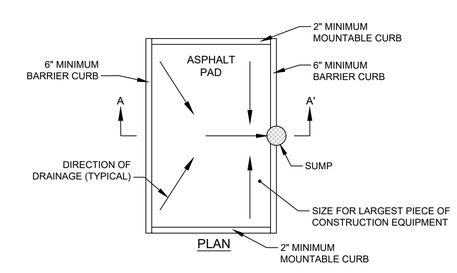


TYPICAL DETAIL
EXCAVATION BACKFILL

SCALE: N.T.S.

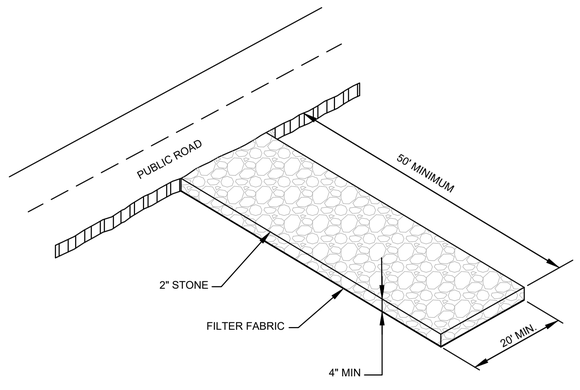
NOTE:

ALTERNATE BACKFILL SEQUENCE MAY BE PROPOSED BY THE CONTRACTOR. HOWEVER, NON-WOVEN GEOTEXTILE SEPARATION LAYERS ARE REQUIRED BETWEEN ALL DISSIMILAR SOIL AND AGGREGATE MATERIALS TO REDUCE THE MIGRATION OF FINE-GRAINED SOIL PARTICLES.



TYPICAL DETAIL
EQUIPMENT DECON PAD

SCALE: N.T.S.



TYPICAL DETAIL
ANTI-TRACKING PAD

SCALE: N.T.S.

DECONTAMINATION NOTES:

1. ALL VEHICLES EXITING EXCLUSION ZONE MUST PASS THROUGH THE CONTAMINANT REDUCTION ZONE. USE EQUIPMENT DECONTAMINATION PAD AS REQUIRED BY ENGINEER AND NYSDEC. CONTROL OVER SPRAY.

100% FOR BID

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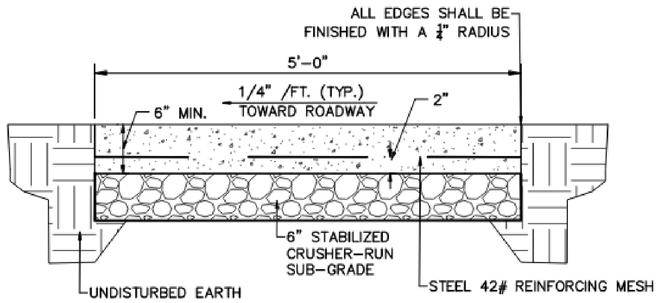
DWG. NO. C-302

DETAILS (2 OF 3)

SHEET NO. 14 OF 15



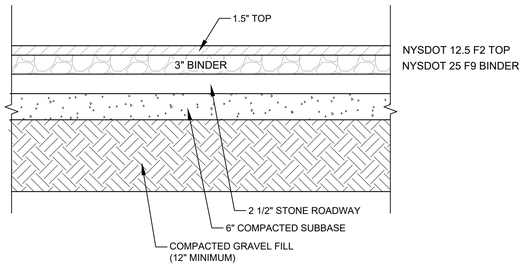
SECTION VIEW

NOTES:

1. THE CONCRETE USED SHALL BE 4000 PSI PORTLAND CEMENT, AIR-ENTRAINED, CLASS "D" CONCRETE WITH AN AIR CONTENT OF 5%, MIN., TO 7%, MAX., AND A SLUMP OF TWO INCHES, MIN., TO THREE INCHES MAX.,
2. ALL NEW CONCRETE SIDEWALKS SHALL BE TRANSVERSELY SCORED TO ONE (1) INCH DEPTHS. 5' INTERVALS. FULL-BEPTH CONSTRUCTION JOINTS SHALL BE PROVIDED AT ALL DRIVEWAY CROSSINGS OR AT 20' INTERVALS, MAX.
3. ALL CURBING SHALL BE RESET OR REPLACED IN KIND AS REQUIRED, CONSISTENT IN EVERY RESPECT WITH CITY SPECIFICATION.
4. A PROTECTIVE SEALER SHALL BE APPLIED OVER THE ENTIRE SIDEWALK TO PRODUCE A DURABLE WEARING SURFACE.

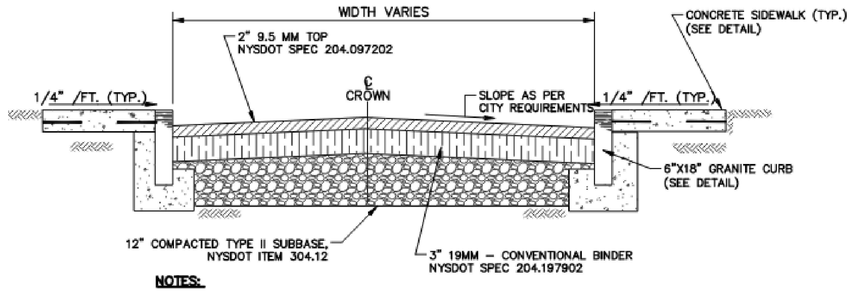
TYPICAL DETAIL
SIDWALK RESTORATION

SCALE: N.T.S.



TYPICAL DETAIL
ASPHALT SURFACE RESTORATION

SCALE: N.T.S.

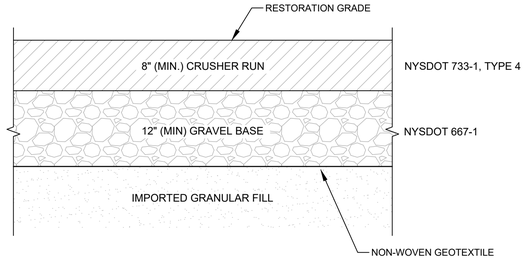


NOTES:

1. SURFACE FEATURES ALONG ROADWAY VARY. CONTRACTOR SHALL RESTORE ALL SURFACE FEATURES TO THEIR CONDITION PRIOR TO CONSTRUCTION ACTIVITIES.

TYPICAL DETAIL
ROADWAY RESTORATION

SCALE: N.T.S.



TYPICAL DETAIL
STONE SURFACE RESTORATION

SCALE: N.T.S.

100% FOR BID

Warning:

It is a violation of Section 7209.2 of the New York State Education Law for any person, unless acting under the direction of a licensed professional engineer, to alter in any way plans, specifications, plats or reports to which the seal of a professional engineer has been applied. If an item bearing the seal of a professional engineer is altered, the altering engineer shall affix to the item his seal and the notation "Altered By" followed by his signature, the date, and a specific description of the alteration.

0 1"

If this scale bar does not measure 1" then drawing is not original scale.

NO.	DATE	ISSUE/REVISION	APP
0	12/23/2021	100% FOR BID	DRK

STATE OF NEW YORK · DANIEL R. KOPCOW · 077276 · LICENSED PROFESSIONAL ENGINEER

Designed:	CRP/PJS
Checked:	PJS/JSH
Drawn:	DTE/PHH
Submitted By:	DRK
P.E. Number:	077276-1

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nationalgrid

GEI Project 102781

OU2 Off-Site Impacts Remedial Design
Clinton Street Former MGP Site
Schenectady, New York

DWG. NO. C-303

DETAILS (3 OF 3)

SHEET NO. 15 OF 15