TECHNICAL SPECIFICATIONS AND CONTRACT DRAWINGS

# NM-Herkimer Smith Street MGP Site
# Site No. V00471-6
# Herkimer, New York

**National Grid, Inc.**
**Syracuse, New York**

November 2, 2012

O'BRIEN & GERE

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# SPECIAL PROVISIONS

## SP-1 WORK SCHEDULE

The work of this Contract shall be scheduled in a manner mutually acceptable to the Owner, Owner's Representative, Engineer, and the Contractor. Unless otherwise especially permitted, no work shall be done between the hours of 8:00 p.m. and 7:00 a.m., nor on Sundays, July 4 (or designated holiday for July 4); Thanksgiving Day and the day after; Christmas Day and the day before; New Year's Day; and the Monday designated holidays for Memorial Day and Labor Day, except as necessary for the proper care and protection of work already performed and for maintenance and operation of the dewatering pumps and construction water treatment plant. The Contractor will be allowed to work on Saturdays only with approval from the Owner and Engineer. If it shall become absolutely necessary to perform work at night, the Engineer shall be informed a reasonable time in advance of the beginning of performance of such work. Only such work shall be done at night as can be done satisfactorily and in a safe manner. Good lighting and all other necessary facilities for carrying out and inspecting the work shall be provided and maintained at all points where such work is being done. Minimum permissible illumination intensities are identified in 29 CFR 1910.120. All Contractor requests to perform night, Saturday, Sunday or Holiday work shall be made in writing to the Engineer.

## SP-2 CONTRACT WORK AREA SECURITY

The Contractor shall erect and maintain a 6 ft tall chain link fence around the site for the duration of work. Gates shall be closed and secured during hours of non-operation or whenever there is not a manned security presence on site. The Contractor shall provide manpower as they deem necessary to monitor site security or operation of the construction water removal and treatment plant. The Contractor is not required to provide a security guard but may choose to do so at their own discretion for the care and protection of the work, equipment, and material. However, no additional payment for a security guard or other manning shall be made by the Owner, the cost for security being included in the Contractor's cost for mobilization or other applicable payment items (e.g. construction water management).

## SP-3 NOTICES

Whenever, under the terms of this Contract, written notice is required to be given by the Contractor to the Owner, it shall be directed to:

National Grid Corporation
Environmental Dept. C-1
300 Erie Boulevard West
Syracuse, New York 13202
Attention: Mr. Steven Stucker

A copy shall be provided as well to the Owner's Representative and Engineer.

## SP-4 NYSDEC REVIEW

A. The Contractor is advised that they should allow up to 20 days time for review and comment on each draft Work Plan submitted for review. No additional payment or extension of time shall be provided to the Contractor for failure by the Contractor to satisfactorily address specified requirements.

B. Copies of each of the documents shall be provided electronically to the Engineer, in both PDF and MS Word format.

C. No work shall be started until the Work Plans have been reviewed and accepted by the Engineer. If conditions change during construction, the Contractor may be required to submit a revised document for review as directed by the Engineer.

## SP-5 PROGRESS AND COORDINATION MEETINGS

In addition to the Pre-Construction Meeting required by National Grid, progress and coordination meetings will be held weekly or as directed by the Owner's Representative with the Contractor's supervisory representatives, with decision-making authority, in attendance.

## SP-6 EMERGENCY CALLS

The Contractor shall provide the Owner with the phone numbers of at least three responsible persons, to be used during non-working hours and weekends, who shall be in a position to dispatch personnel and equipment to the project site in the event of an emergency.

## SP-7 EXISTING UTILITIES

A. Special precautions shall be observed to not cause interference or damage to any existing utilities.

B. The Contractor shall notify the proper utility companies at least seventy-two (72) hours before construction is started adjacent to such utilities. Proof of such notification shall be filed with the Owner's Representative and Engineer. Failure to provide such proof shall be cause for an automatic cessation of the work. Utilities shall be protected in the manner prescribed by the utility company. No additional compensation other than stated in the Payment Items will be made for coordination or requirements of others relative to existing utilities.

## SP-8 CONTRACTOR'S CONSTRUCTION QUALITY CONTROL PLAN

A. The Contractor shall prepare and implement a Construction Quality Control (CQC) Plan for the work of this Contract. The plan shall include, as a minimum, the following:

(1) Description of the CQC organization, including chart showing lines of authority.

(2) Names, qualifications, duties, responsibilities and authorities of each person assigned a CQC function.

B. The CQC staff shall include a CQC Manager who shall be required to be on-site during the construction period. The CQC Manager shall have demonstrated experience with earthwork projects

C. The Contractor's CQC Analytical Laboratory providing testing services shall be an independent New York State-certified laboratory not owned by the Contractor and/or subcontractors or owned by a subsidiary or affiliate of the Contractor and/or subcontractors. The Analytical Laboratory shall have an internal QC plan to confirm that laboratory procedures conform to applicable standards and test methods. The laboratory shall follow the internal QC procedures. The laboratory shall allow National

Grid, Owner's Representative, and Engineer to observe sample preparation, testing procedures, record-keeping procedures, and some or all tests at any time, either announced or unannounced.

D. All laboratory test results shall be certified by a Laboratory Manager with a minimum of five years of testing experience.

E. The Contractor's CQC Plan shall be subject to acceptance by the Engineer prior to commencement of construction activities. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Construction Manager shall reserve the right to require the Contractor to make changes to his CQC Plan and operations as necessary to obtain the quality specified.

F. Following acceptance of the CQC Plan, the Contractor shall notify the Construction Manager in writing of any proposed changes. Proposed changes are subject to acceptance by the Construction Manager.

SP-9 BORROW MATERIALS

A. Contractor shall submit an affidavit from the owner of the source of each type of borrow material stating that to the best of their knowledge, the site of the source material was never used as a dump site for chemical, toxic, hazardous or radioactive materials and it is not now nor ever has been listed as a suspected depository for chemical, toxic, hazardous or radioactive materials by any Federal, State or governmental agency, department, or bureau.

B. The Contractor shall sample each different type of off-site material incorporated into the work at the location or locations identified by the Engineer. The Contractor shall perform analyses for Target Analyte List (TAL) volatile organic compounds (VOCs), TAL semi-volatile organic compounds (SVOCs), TAL metals, cyanide (total and amenable), and PCBs/Pesticides in accordance with NYSDEC guidance document DER-10, Table 5.4(e)10 for each source; unless the source is a NYSDOT-approved pit and the Engineer waives the requirement to conduct chemical analyses in accordance with DER-10. Laboratory data shall be submitted to the Engineer for review, on Owner's behalf, immediately upon receipt and prior to use of the material on-site. The Engineer shall be the sole judge as to what constitutes each different type of material; however the definition of "different" shall include, but not necessarily limited to, variances in the physical properties of the same material, as well as the same material derived from separate borrow sources or separate areas in the same borrow pit. The analytical results will be compared to the unrestricted cleanup objectives set forth in 6 NYCRR Part 375. If the materials are found to be unacceptable by the Engineer, the Contractor shall remove and properly dispose of the materials in accordance with all applicable Federal, State and local laws and regulations at the Contractor's expense and liability.

SP-10 RETENTION OF RECORDS

Contractor and its agents and subcontractors shall preserve all documents, records, and information of whatever kind, nature or description relating to the performance of the Work for ten (10) years after Substantial Completion, as defined by the Contract Documents.

SP-11 REPORTING REQUIREMENTS

A. Contractor shall submit to Owner's Representative, Engineer and Owner written progress reports, monthly or less frequently if less frequent submission is approved in writing by the Owner that: (a) describe the Work that has been performed during the previous month; (b) include a summary of all

results of sampling and tests and all other data received or generated by Contractor or its subcontractors or agents in the previous month; (c) identify all work plans, plans and other deliverables completed and submitted during the previous month; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction, including but not limited to bar charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; and (f) include any modifications to the work plans or other schedules that the Owner's Representative, Engineer, or the Owner has proposed to NYSDEC or that have been approved by NYSDEC. Contractor shall submit these progress reports to the Owner by the fifth day of every month following the commencement of the Work.

B. Contractor shall notify the Owner's Representative, Engineer and the Owner of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than twelve days prior to the performance of the activity.

SP-12 EMERGENCY RESPONSE

In the event of any action or occurrence during the performance of the Work which causes or threatens a release of waste material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Contractor shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release and shall immediately notify the Engineer, Owner's Representative, Owner, and NYSDEC's Project Coordinator. The term "waste material" as used in this section shall mean: (1) any "hazardous substance" under Section 101(14) of CERCLA. 42 U.S.C. §9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA. 42 U.S.C. §9601(33); and (3) any "solid waste" under Section 1004(27) of RCRA. 42 U.S.C. §6903(27).

SP-13 STAGING PLAN

Prior to commencement of work, the Contractor shall develop and submit methods and sequencing of all intended operations hereinafter referred to as the Staging Plan. The Staging Plan shall include, but not be limited to, methods, plans, and drawings necessary for staging trailers and equipment, stockpiling materials, designating work zones and requirements for other construction activities. Construction activities shall not be initiated until the methods and sequencing of all operations have been reviewed and approved by the Engineer.

SP-14 UTILIZATION OF ON-SITE MATERIALS

The Contractor is not permitted to utilize on-site material for purposes of meeting Contractor's material requirements, unless shown, specified or otherwise directed by the Engineer in writing.

SP-15 EXISTING MONITORING WELLS

The approximate locations of existing monitoring wells at or near the site are shown on the Contract Drawings. Monitoring wells noted to be abandoned shall be abandoned in accordance with the Contract Documents. All other monitoring wells shall be protected from damage. Any wells not designated to be abandoned, that are damaged by the Contractor shall be repaired or replaced at no additional cost, as directed by and to the satisfaction of the Construction Manager who will oversee rehabilitation or replacement as specified. The

Owner's cost associated with bringing the Construction Manager on-site for oversight of rehabilitation or replacement work will be deducted from payments due the Contractor.

SP-16 SUPPLEMENTAL INFORMATION

A. Certain site and chemical information may be shown on separate sheets or made available by the Owner or Engineer to Bidders, Contractors, and other interested parties. Neither such information nor the documents on which it may be shown shall be considered a part of the Contract Documents or Contract Drawings, it being understood that such information is made available only as a convenience, without express or implied representation, assurance, or guarantee that the information is adequate, complete, or correct, that it represents a true picture of the site and chemical conditions to be encountered, or that all pertinent site and chemical data in the possession of the Owner or Engineer has been furnished.

B. It shall be the Contractor's responsibility to satisfy the Contractor as to the nature, character, quality and quantity of conditions likely to be encountered. Any reliance upon the site information and chemical data available shall be at the Contractor's risk. The Contractor agrees that he shall neither have nor assert against the Owner or Engineer any claim for damages for extra work or otherwise or for relief from any obligation for this Contract based upon the failure by the Owner or Engineer to obtain or to furnish all site or chemical information in the Owner's or Engineer's possession or based upon any inadequacy or inaccuracy of the information furnished; provided, however that the Contractor may be entitled to an adjustment in the contract price under the circumstances and to the extent provided in the Contract.

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# SECTION 01300

# SURVEYS

## PART 1 GENERAL

### 1.1 SUMMARY

A. This Section includes furnishing all labor, material, and equipment required to perform and provide complete surveys, as specified herein or as specified by the Engineer.

### 1.2 SUBMITTALS

A. The following items shall be submitted:

1. Surveyor Qualifications: Prior to the start of any survey work, submit the name, address, State registration number, and telephone number of the surveyor and other persons proposed for survey-related duties to the Engineer for approval.

2. All project submittals shall be signed by a surveyor licensed in New York State.

3. Provide periodic survey calculations required to support requests for payments and verification of volumes and areas.

4. Record Drawings

A. Topographic maps – prepare and submit:

1. Prior to disturbance of site.

2. After installation of excavations shoring (i.e. sheetpile)

3. After excavation showing excavation depths (elevation data) and horizontal limits of each excavation.

4. After backfill and replacement of topsoil, asphalt and site features, and prior to final inspection.

5. Submit the following with each record drawing submittal.

A. Records

1. AutoCad 2010 (or newer) electronic files on CD-Rom

2. Field Data

3. Coordinate List

1.3 QUALITY ASSURANCE

A. All work in this section shall be performed by a surveyor licensed in New York State.

B. Mapping shall conform to the National Map Accuracy Specifications and shall bear the seal of a licensed land surveyor registered in New York State. The surveyor shall also have a minimum of two years experience in construction surveying, and layout and maintenance of record construction drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

PART 2 PRODUCTS

2.1 SUPPLEMENTAL RECORD DRAWINGS

A. Contractor shall provide a reproducible base map at a scale of 1 inch = 10 ft with 1-ft elevation contours upon which the Contractor shall plot the required survey information for each required submittal.

B. Map shall contain a title block with the name and address of the Contractor and the signature of the registered surveyor.

C. Drawings shall include:

1. Labeled contour lines
2. Property line locations
3. Horizontal grid systems
4. Cross sections and details modified to show “as-built” conditions
5. Utility pipe invert elevations and locations
6. Details and cross sections not on original drawings
7. Field changes of elevations, dimensions, and details

D. Indicate on drawings locations of all physical features on site, including utilities, buildings, roadways, catch basins, manholes, utility poles, fences, gates, drainage ditches, monitoring wells, light poles, trees, and bench marks.

E. Indicate excavation limits on drawings for both the proposed limits (based on Contract Drawings) and completed limits.

2.2 FIELD DATA

A. Field survey notes

1. Copy of field notes, notations, and descriptions or total station electronic files used and compiled during the field survey

2.3 COORDINATE LIST

A. Final coordinate list of all survey points with specific coordinates and elevations.

## PART 3 EXECUTION

### 3.1 INSPECTION

A. The surveyor/Contractor shall verify site conditions within the project area and locations of site reference and survey control points prior to starting work. The surveyor/Contractor shall promptly notify the Engineer of any discrepancies discovered.

B. The surveyor/Contractor shall locate all utilities in the work area. The surveyor/Contractor shall verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated or discovered during work.

### 3.2 HORIZONTAL AND VERTICAL CONTROL

A. The Contractor shall take all reasonable measures to protect site reference points prior to starting and during site work.

B. Immediately notify the Engineer of loss, damage, or destruction of any reference point, or any relocation required because of changes in grade or other reasons.

C. X, Y, and Z coordinates of bench marks and control points shall be determined and recorded with a maximum permissible error of 0.01 ft vertical and 0.001 ft horizontal.

D. The Contractor shall provide control points at each location of work using closed traverse and leveling loops.

E. The Contractor shall provide grade and offset stakes to control the location and depth of excavation and backfill.

F. The Contractor shall survey the location and elevation of all excavation and backfill limits to document the areas remediated.

G. The Contractor shall provide survey control as required to properly complete and document the work.

H. Lack of adequate survey control or improperly maintained “as-builts” will be the basis for rejection of the Contractor’s application for payment until corrected.

### 3.3 COORDINATE LIST

A. The Contractor shall compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum (NAD).

B. The elevations shall be on the National Geodetic Vertical Datum (NGVD) 1927.

### 3.4 SURVEY NOTES

A. The Contractor shall record all fieldwork in a clear, legible, and complete manner.

B. The Field Survey Book(s) shall contain a complete description of the nature and location of the new and existing points. The record shall also include a sketch of the point locations, and the monument witness points.

C. The Contractor shall maintain survey notes on-site for review and use by Engineer.

3.5 UTILITIES

A. The Contractor shall locate all utilities in the work area.

B. The Contractor shall verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated or discovered during work.

C. The Contractor shall record elevations of all encountered buried piping and utilities exposed, and all structures left in place during the course of the project for incorporation in the project record documents.

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SECTION 01580

PROJECT SIGN

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes furnishing, installation, and maintenance of a project sign.

1.2 SUBMITTALS

A. The following items shall be submitted:

a. The Contractor shall submit a drawing detailing the project sign including but not limited to, all dimensions, materials of construction, lettering heights and spacing.

b. A drawing or sketch showing the proposed location and orientation for the project sign at the site.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

1. All lumber shall be structural quality and exterior grade (pressure treated)

2. All bolts, nuts, and washers shall be plated or galvanized steel.

3. The sign will be adequately supported with regard to site conditions and will be an adequate distance above the prevailing grade to permit public viewing.

4. The sign will be constructed of a 4.0 feet high by 8.0 feet wide exterior type high-density plywood overlaid with vinyl sheeting, or other sign material of equivalent quality, and framed with nominal 2 inch by 4 inch wood of suitable grade.

5. Lettering will be of professional quality and in accordance with this specification; all lettering will be in proportion to the sizes indicated and centered on the sign.

B. Painting/color scheme

1. Paint shall be weather resistant, suitable for exterior sign applications, and compatible with exterior grade plywood and primer.

2. The sign face background shall be white.

3. Lettering shall be colored as specified below based on NYSDEC standards:

| Text | Color |
|---|---|
| DEC logo | PMS 301 Blue<br>PMS 355 Green |
| Copy surrounding DEC logo – "NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION" | PMS 355 |
| Manufactured Gas Plant Program | PMS 301 |
| Smith Street, Herkimer | PMS 355 |
| NYSDEC Site No. V00471-6 | PMS 355 |
| National Grid, Inc. | PMS 355 |
| Names of Governor, Commissioner, and Municipal Executive | PMS 301 |
| "Transform the Past… Build for the Future" | PMS 355 |

4. Text type shall be Casion 540, with the exception of the logotype. Center each line of copy with small caps and initial caps.

5. The back of the sign and all supports, bracing, and trim shall be painted white.

PART 3 EXECUTION

3.1 GENERAL

A. The project sign shall read as follows below the NYSDEC logo:

MANUFACTURED GAS PLANT PROGRAM

SMITH STREET, HERKIMER
NYSDEC SITE No. V00471-6

Governor
Commissioner
Municipal Executive

Transform the Past…. Build for the Future

B. A separate sign shall be posted at the entrance to the site identifying the name of the firm constructing the work, point of contact (name and 24-hour telephone number for emergencies, and the following other contacts:

NYSDEC – Bernard Franklin (518) 402-9662
National Grid – Steven Stucker (315) 428-5652
O'Brien & Gere (Engineer) - Stephen Anagnost (315) 956-6100

C. The signs shall be adequately supported and braced, and properly positioned and aligned.

D. The project signs shall be posted in a prominent location at the site and amenable to public viewing following the notice to proceed.

3.2 MAINTENANCE

A. The Contractor shall provide any and all patching, painting, lettering, and bracing required to maintain the signs in good condition during the project.

3.3 CLOSURE

A. The signs are to remain on-site until project completion and notification from the Engineer. At that time, the signs shall be dismantled and removed by the Contractor, and shall become the Contractor's property.

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SECTION 02003

FIELD OFFICE TRAILER

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of a separate field office trailer for the exclusive use of the Engineer and NYSDEC, as specified herein, or as directed by the Engineer.

1.2 SUBMITTALS

A. The following items shall be submitted:

1. Proposed layout of the trailer

2. Proposed method of furnishing the utilities

PART 2 PRODUCTS

2.1 ENGINEER FIELD OFFICE TRAILER

A. The field office trailer shall be not less than 300 square feet, with separate offices for the Engineer and NYSDEC.

1. Built-in Items

a. Full width double desk on each end with two-drawer file cabinets, pencil drawers and overhead shelves

b. Drafting table, minimum 36 inch by 72 inch double storage below

c. Forced air heat

d. One air conditioning unit - not less than 8,000 BTU

e. Storage closet

2. Movable Items

a. Flat top movable desk, minimum 36” x 72”, with filing and storage drawers

b. One desk chair

c. Four office chairs

d. Two large waste baskets

e. One drafting stool

f. One four-drawer, fire-proof, legal size, filing cabinet with lock

g. Six folding or stacking chairs

h. One eight place plan rack

i. One combination printer/copier/telephone facsimile machine with paper supply as requested by the Engineer

j. One Xerox type copying machine capable of copying legal size (8 ½" x 14") paper, and a supply of 8 ½" by 11" and legal size paper as requested by the Engineer.

k. Two telephones, each with speaker phone feature, for exclusive use by the Engineer and NYSDEC.

l. One telephone answering and message recording machine for the sole use of the Engineer and one telephone answering and message recording machine for the sole use of the NYSDEC.

m. One folding utility table 30 inches high with minimum top dimensions of 36 inches by 72 inches.

n. One "dorm size" refrigerator having capacity of 1.7 cubic feet, minimum.

o. One 20 lb combination type fire extinguisher.

p. First Aid and eyewash station.

B. Telephone Service

1. Install an individual direct line telephone for the exclusive use of the Engineer and a separate direct telephone line (different phone numbers) for the exclusive use of the Engineer's facsimile copying machine.

2. Install an individual direct line telephone for the exclusive use of the NYSDEC.

3. Include the cost of all local and long distance calls necessary to the work.

C. Internet Service

1. Install a wireless internet service for the exclusive use of the Engineer and NYSDEC.

D. Water Service

1. Install a water dispenser capable of dispensing hot and cold potable water.

PART 3 EXECUTION

3.1 INSTALLATION

A. The trailer shall be located on an approved site convenient to the work with OSHA-compliant steps for access.

1. The field office trailer shall be ready for occupancy prior to starting work in the field.

2. The office shall be furnished and maintained until the acceptance of the Contract.

3. Relocate once, if directed, during the period of the Contract.

4. Upon the completion and acceptance of the Contract, the Contractor shall remove the field office trailer and restore the area in accordance with the Section “Restoration of Surfaces.”

3.2 MAINTENANCE

A. The maintenance of the trailer shall include but not be limited to:

1. Adequate heating and cooling including a continual supply of fuel

2. Electric power and lights

3. Water supply and sewer service

4. Telephone service

5. Snow removal in winter

6. Janitorial services not less than weekly

B. Should sanitary and potable water services not be available on or near the site, portable facilities shall be provided.

1. When sanitary and potable water becomes available services shall be provided.

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# SECTION 02006

# HEALTH AND SAFETY

## PART 1 GENERAL

### 1.1 SUMMARY

A. Contractor shall be solely responsible for the protection of the personnel working on the site and the residents living in the vicinity of the site from exposure to on-site contaminants generated or released as a result of the Contractor's work on site.

B. Contractor shall prepare, submit to Engineer, and implement a site specific health and safety plan (HASP) to protect the personnel working on the site and the residents living in the vicinity of the site from exposure to on-site contaminants encountered, generated, or released as a result of the Contractor's work on site.

C. Contractor shall retain an independent, third-party firm to provide health and safety monitoring at the Site and enforcement of the HASP.

D. Contractor shall retain an independent, third-party firm to conduct the Community Air Monitoring Required in accordance with this specification and the New York State Department of Health Generic Community Air Monitoring Plan.

### 1.2 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. National Institute for Occupational Safety and Health (NIOSH), United States Department of Health and Human Services

    a. 85-115 - Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

    b. NIOSH Manual of Analytical Methods – analysis for total particulate ($ug/m^3$) method 0500

2. Code of Federal Regulations (CFR)

    a. 29 CFR 1910 and 1926 - OSHA Safety and Health Standards, and citations adopted by reference

    b. OSHA Analytical Methods Manual, Part I, Volume 3, Methods 55-80 for Polynuclear Aromatic Hydrocarbons

    b. 49 CFR Parts 171-178 - Department of Transportation (DOT) Hazardous Materials Regulations

3. Unites States Environmental Protection Agency (USEPA)

   a. Standard Operating Safety Guides

   b. EPA Analytical Method TO-15 (mini cans)

4. American Conference of Governmental Industrial Hygienists (ACGIH)

   a. ACGIH Threshold Limit Values and Biological Exposure Indices

1.3 SUBMITTALS

A. The following items shall be submitted:

1. Site Specific Health and Safety Plan including, but not limited to:

   a. Contractor Organizational Chart

   b. Results of Health and Safety Risk Analysis performed by the Contractor

   c. Employee and Community Protection Plan

   d. Employee Air Monitoring Plan

   e. Employee Training and Experience

   f. Summary of Medical Surveillance Program

   g. List of Standard Operating Procedures incorporated into the HASP

   h. A method to monitor entry and exit from the work site

   i. Personnel and Equipment Decontamination Procedures

   j. A Spill Containment Program

   k. Emergency Response Plan and Emergency Reporting Procedures

   l. Fire Emergency Protection Plan

   m. Confined Space Entry Procedures

2. Certificates of completion of Health and Safety Training as required by 29 CFR 1910.120(e).

3. Resumes of the Contractor's Project Manager, Field Supervisor, and of the health and safety staff expected to work at this site.

4. Evidence of coordination for emergency response with local police, fire, medical, and hazardous materials responders.

5. Air monitoring results.

6. Name and location of proposed permitted off-site disposal facility for used personal protective equipment (PPE).

PART 2 PRODUCTS

2.1 GENERAL

A. The responsibility for development, implementation, and enforcement of the Health and Safety Plan (HASP) lies with the Contractor and his health and safety personnel.

B. Prior to commencement of on-site activities, the Contractor shall prepare a site-specific HASP, which shall be implemented during performance of the work. The HASP shall be prepared and administered by a Certified Industrial Hygienist (C.I.H.). All pertinent aspects of applicable regulations shall be addressed. The protective measures in the HASP shall be consistent with applicable protocols and provisions of the OSHA regulations and other applicable regulations. The HASP developed by the Contractor shall include, but not be limited to, employee air monitoring, programs for accident prevention, personnel protection, and emergency response/contingency planning. A corporate safety and health manual may be furnished along with the HASP but this shall not satisfy the site-specific HASP requirement.

C. At least one copy of the HASP shall be present at the site at all times.

PART 3 EXECUTION

3.1 ORGANIZATIONAL RESPONSIBILITIES

A. Key Personnel and Organizational Chart. The lines of authority, responsibility and communication shall be presented in the HASP. The Contractor must provide an organization chart and resumes of the Contractor's key personnel involved in all phases of the Site construction activities. This chart must include Senior-Level Management, Project Manager, CIH, Site Health and Safety Officer (HSO), Field Supervisor, and Foreman Personnel. Resumes are required for the Project Manager, Field Supervisor, Health and Safety Officer, and Health and Safety Staff.

B. Site Health and Safety Officer (HSO). The Contractor’s C.I.H. must identify and assign a Site Health and Safety Officer (HSO) for the project. The HSO shall have no other project responsibilities and be dedicated solely to health and safety monitoring and HASP enforcement. That individual must be responsible to the Contractor's C.I.H. and have the authority and knowledge necessary to implement the site Health and Safety Plan (HASP) and verify compliance with applicable safety and health requirements.

1. The HSO shall have the following responsibilities and authority to perform the following functions:

    a. Be present during site operations.

    b. Have the authority to enforce the HASP and stop operations if personnel safety and health may be jeopardized.

    c. Evaluate health monitoring data and make necessary field decisions regarding safety and health.

    d. Initiate evacuation of the site if necessary.

2. The HSO shall meet the following minimum qualifications:

    a. HSO shall possess a sound working knowledge of State and Federal occupational safety and health regulations and shall have formal educational training in occupational safety and health. Documentation shall be provided that the HSO has completed the 40 hr. OSHA Training Course, the 8 hr. OSHA Supervisor's Training Course and met the field experience requirements.

    b. Have documented experience that the HSO has worked on two (2) projects similar in nature to this one.

## 3.2 RISK ANALYSIS

A. Health and Safety Evaluation. The Contractor shall perform and provide in the HASP the results of a health and safety risk analysis for each location and operation to be performed.

B. The risk analysis shall be based upon the best information available regarding the contaminants and conditions present at the site as well as the practices and tools to be applied in the operation and shall include but not be limited to the following:

1. Overview of the following information:

    a. Location, site topography, accessibility, and size of the site.

    b. Description of the site operation and tasks to be performed.

    c. Approximate duration of the operation and of each task.

    d. Chemical and physical properties of the known or suspected hazardous substances and health hazards.

    e. Known or potential safety hazards associated with each task.

    f. Known or suspected pathways of hazardous substance dispersion pertinent to the operation and tasks performed.

2. An evaluation of the known or suspected contaminants and conditions that may pose inhalation, skin absorption/contact or ingestion hazards. A copy of the Material Safety Data Sheet (MSDS), chemical fact sheet, or other relevant information shall be included in the Site-specific HASP prepared by the Contractor.

3. An evaluation of known or potential safety and health hazards associated with each task on the site.

4. An evaluation of engineering and work practice controls to be applied to minimize potential harm to the community and employees on site from hazardous substances and activities during completion of the task.

   a. Engineering and Work Practice Controls. The Contractor must consider the need to apply engineering and/or work practice controls as a means of protecting the community and personnel in the performance of site specific tasks.

      1) When practicable, engineering controls shall be implemented to reduce and maintain community and employee exposures to or below acceptable levels for those tasks with known or suspected hazards.

      2) Work practice controls shall be applied when engineering controls are deemed impractical and shall be incorporated as site-specific standard operating procedures (SOP) for personal precautions and routine operations.

5. An evaluation of the status and capabilities of emergency response teams.

## 3.3 MEANS TO CONTROL EMPLOYEE AND COMMUNITY EXPOSURE

A. Employee and Community Protection Plan

1. The Contractor shall prepare and implement an Employee and Community Protection Plan (ECPP) in accordance with 29 CFR 1910.120(h). The ECPP shall be developed to specify and evaluate the engineering and work practice controls to be implemented to minimize exposure of employees working on the site, residents living in the vicinity of the site, and the environment to contaminants generated or released as a result of work on the site. The ECPP shall be incorporated into the site HASP as a separate section of that document.

B. Employee Air Monitoring Plan

1. The Contractor shall prepare and implement an Employee Air Monitoring Plan (EAMP) to identify times of elevated airborne contaminant concentrations, to determine the level of the concentrations relative to background, and to respond to elevated levels. The Contractor shall provide the personnel, instruments, and materials necessary to perform such

air monitoring and to implement the response. The identity of the individual responsible for administering the program shall be included in the site organization chart. In addition to the odor control requirements specified in the Special Provisions, the Contractor shall define specific air monitoring methods, sampling media, and sample analyses to be implemented during construction of the remedial action at the Site to protect Employees and others on site. The EAMP shall include proposed responses to levels above the Contractor's action levels. The EAMP shall be incorporated into the site HASP as a separate section of that document.

C. Community Air Monitoring and Response

1. The Contractor shall hire an independent, third-party firm to conduct Community Air Monitoring using a photo-ionization detector (PID) for total VOCs and PM-10 meter for particulates during the Construction Contractor's invasive work. Also, observation of odor at the site perimeter and in the direction of off-site receptors will be documented and reported to the NYSDEC on-site representative. The Construction Contractor shall be responsible for conducting the construction work so that the level of particulate matter less than 10 micrometers in diameter (PM-10) leaving the downwind side of the site (if any) shall be maintained below 150 $\mu g/m^3$ above the upwind particulate level, based on a 15 minute averaging period. Also, the Construction Contractor shall be responsible for conducting the construction work so that the level of volatile organic compounds (VOCs) leaving the downwind side of the site shall be maintained below 5 ppm above background. The Contractor shall provide means to minimize odor and implement additional odor controls to reduce objectionable odors, if observed and deemed to be objectionable by the Engineer, when necessary.

2. Vapor Emission Response

a. VOC levels exceeding 5 ppm above background at the perimeter of the work area will require that work activities be halted by the Contractor, and actions initiated by them to reduce the VOC emissions from the work area. At that time, air monitoring shall be implemented by the independent third-party firm hired by the Contractor to measure the vapor emission levels in the work zone and at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure. If VOC levels in the work zone or downwind location are below or decrease to below 5 ppm over background, work activities can resume with continued monitoring.

b. If the VOC level at the perimeter of the work area is above 25 ppm, activities must be shutdown and actions taken by the Contractor to reduce VOC levels at the perimeter of the work zone to below 5 ppm above background.

c. If efforts to abate the emission source do not lower the VOC levels below 5 ppm at the downwind sampling location or if elevated

levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), the Major Vapor Emission Response Plan prepared by the independent third-party firm shall be implemented.

3. Particulate Emission Response

a. Actions shall be initiated by the Contractor to reduce the particulate emissions from the work area whenever the particulate levels exceed 100 $\mu g/m^3$ above the upwind particulate level (*e.g.* background) at the perimeter of the work area, as measured by the independent third-party firm hired by the Contractor. Particulate levels exceeding 150 $\mu g/m^3$ above the upwind particulate level at the perimeter of the work area will require that work activities be halted by the Contractor. At that time, air monitoring shall be implemented by the independent third-party firm to measure the particulate emission levels in the work zone and at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure. If particulate levels in the work zone or downwind location are below or decrease to below 150 $\mu g/m^3$ over background, work activities can resume with continued monitoring.

b. If efforts to abate the emission source do not lower the particulate levels below 150 $\mu g/m^3$ 200 feet downwind of the work area, or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), a Major Particulate Emission Response Plan prepared by the independent third-party firm shall be implemented.

## 3.4 TRAINING

A. Training Requirements for On-Site Personnel

1. The Contractor will ensure that all employees engaged in on-site activities which expose or potentially expose them to hazardous substances and/or health hazards have satisfied the general and site specific training requirements of 29 CFR 1910.120 prior to the start of the employee's activities at the site.

2. Employees who have not received the required training prior to the start of the employee's site operations are not to engage in site operations until such training has been completed.

3. The Contractor shall provide written certification of completed training and acquired experience for all employees requiring training and/or experience. Such certification shall be supplied prior to the start of the employee's site operations.

B Personal Protective Equipment and Levels of Protection

1. The Contractor shall provide and use, under each item of work requiring such protection, personal protective equipment (PPE) under the provisions of 29 CFR 1910.132 and 29 CFR 1910.120.

2. The Contractor shall include in the HASP a list of components for each protective ensemble, the LOP selected for each task, the rationale for each task-specific selection, any contaminant action levels to be followed in LOP decision making.

3. All used PPE shall be properly disposed of by the Contractor at a permitted off-site facility approved by Owner. Used PPE shall not be disposed of on Site nor shall it be burned. The Contractor shall be responsible for characterizing used PPE, decontamination (as necessary), temporary storage, transportation, and disposal of used PPE in accordance with applicable Federal, State, and local regulations.

## 3.5 MEDICAL SURVEILLANCE

A. Medical Surveillance Program. The Contractor shall show evidence of a medical surveillance program (MSP) for employees engaged in on-site operations, consistent with 29 CFR 1910.120(f).

1. The MSP shall include physical examinations supervised or administered by a board certified physician familiar with occupational medicine. The Contractor shall include the name and business address of the certified physician in the HASP.

2. The Contractor shall address the need for personal exposure monitoring and post exposure medical screening in the HASP and include a summary of applicable monitoring and screening.

B. Personnel Certification

1. The Contractor shall provide written approval by a certified physician of the medical fitness for work of all employees designated to engage in on-site operations, prior to the employee's start of those operations.

C. Employee Heat and Cold Stress Prevention

1. As dictated by seasonal conditions, the Contractor shall implement an employee heat or cold stress prevention program during site operations and shall incorporate the program into the site HASP.

## 3.6 SITE STANDARD OPERATING PROCEDURES

A. The Contractor shall be responsible for developing and implementing necessary standard operating procedures (SOP) for site operations.

## 3.7 SITE CONTROL

A. Work Zones

1. The Contractor shall be responsible for conducting operations at the site in such a controlled fashion as to minimize the possibility of employee and community contact with contaminants present on the site and to prevent the removal of contaminants generated on the site by personnel or equipment leaving the site.

2. The Contractor shall delineate work zones in which specific operations or tasks will occur and shall institute specific site entry, and decontamination procedures at Contractor designated control points in accordance with provisions set forth in 29 CFR 1910.120 and HWR 89-4031. At a minimum, three (3) work zones will be established to perform this work - an exclusion/contamination zone, a contamination reduction zone, and a support/clean zone. A map or diagram showing the work zones and a description of the site control plan shall be included in the HASP.

B. Routine and Emergency Communications

1. The Contractor shall incorporate plans for routine and emergency communications appropriate for the site and project in the HASP.

C. Daily Visitor Log

1. The Contractor, in accordance with his security plan shall keep a daily visitor log, copies to be provided to Owner/Engineer upon request. A time clock shall be used to record the arrival and departure times. This log shall include:

   a. Person visiting the site
   b. Affiliation
   c. Date
   d. Arrival time
   e. Departure time
   f. Purpose of visit

D. Personnel

1. The Contractor shall provide Owner and Engineer a list of all Contractor and subcontractor personnel who are authorized to enter the site prior to the start of operations, updating the list as necessary. No unauthorized persons shall be permitted to enter the site.

E. Other

1 The Contractor shall be responsible for conducting operations in accordance with Federal, State and local regulations and requirements for storage of the Contractor's hazardous materials (*i.e*. gasoline, lube oils, etc.) on-site, including locating staging areas, labeling/signage, etc.

2. The Contractor shall use a "buddy system" as required.

3. The Contractor shall make appropriate PPE available for all individuals present on the site during implementation of the project.

3.8 DECONTAMINATION

A. The Contractor shall develop and implement personnel and equipment decontamination procedures appropriate for site specific locations and activities and include those procedures in the HASP. The procedures shall include, but not necessarily be limited to, the necessary equipment and personnel and the steps to achieve contractor's specified level of decontamination, provisions for any personnel protection, and a discussion or diagram outlining the steps or stations in the procedures. The procedures must include containment and removal of any decontamination solutions and spent disposable protective apparel.

B. Decontamination shall be conducted in accordance with 29 CFR 1910.120 (k) and shall minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances as well as minimize off-site transport of contamination. The Contractor shall clean roadways as necessary to prevent contamination being transported from the work areas into other parts of the Site or off-site by construction or plant traffic.

C. The Contractor shall provide provisions to facilitate personal hygiene at breaks and following daily operations.

3.9 SPILL CONTAINMENT

A. The Contractor shall incorporate a spill containment program prepared in accordance with 29 CFR 1910.120 in the HASP.

3.10 CONTINGENCY PLANNING

A. Emergency Response Plan. Prior to the start of site operations, the Contractor shall develop and implement an emergency response plan (ERP) to handle potential on-site emergencies. The ERP shall be incorporated into the site HASP as a separate section of that document and shall be periodically reviewed and, as necessary, amended to keep it current with new or changing site conditions or information.

1. The Contractor shall address the following requirements:

a. Prior to the start of site operations, the Contractor shall attend any and all meetings necessary with local officials and/or those

responsible for local emergency management and public safety (to include fire, police, hazardous material response teams, hospitals, and local health officials) for the purpose of coordinating the site-specific ERP with any emergency response efforts that would be performed by such agencies.

b. The Contractor shall contact the local medical facility selected for inclusion into the HASP and the ERP to ensure that said facility is willing and is capable of providing that medical support necessary to satisfy those anticipated hazards and emergencies detailed in the HASP and the ERP. Written verification of such contact, including the name of the individual contacted, shall be furnished to Owner and Engineer prior to the start of site operations.

B. Accident and Exposure Reports

1. The Contractor shall notify the Engineer and Owner's Representative of all on-site accidents at the time of occurrence and follow up in writing within 24 hours. This notification shall include, but not be limited to, the date, time and identity of individual(s) involved in the accident, witnesses to the accident, the nature of the accident, the actions taken to treat the victim(s), and the steps taken to prevent recurrence.

2. The Contractor shall notify the Engineer and Owner's Representative of all person(s) exposed at levels exceeding OSHA standards at the time of occurrence or determination and follow up in writing within 24 hours. This notification shall include, but not be limited to, the date, time, and identity of individual(s) involved in the exposure, witnesses to the exposure, the nature of the exposure episode, what the individual(s) were exposed to, the personal protective equipment worn during the exposure, and the steps taken to prevent recurrence.

3. The Contractor shall notify the Engineer and Owner's Representative of all environmental air measurements exceeding NYSDEC standards. This notification shall include, but not be limited to, the date, time, and identity of individual(s) involved in the exposure, witnesses to the exposure, the nature of the exposure episode, what the individual(s) were exposed to, the personal protective equipment worn during the exposure, and the steps taken to prevent recurrence.

## 3.11 FIRE PREVENTION AND PROTECTION

A. The Contractor shall develop procedures for handling and responding to small and large fires. This Fire Protection Plan (FPP) shall be included in the HASP as a separate document. The FPP shall include procedures for requesting emergency assistance and notifying Owner and Engineer of the incident. The Contractor shall insure that fire traffic lanes are available (not blocked) and all fire exits are properly marked.

3.12 CONFINED SPACE OPERATIONS

A. Standard Operating Procedures

1. Should site operations include activities within confined spaces, the Contractor shall develop and implement SOPs in accordance with 29 CFR 1910.146 and shall incorporate them in the HASP as a separate section of that document.

3.13 DRUM AND CONTAINER HANDLING OPERATIONS

A. Standard Operating Procedures

1. Should site operations include activities requiring the handling of drums and containers, (both encountered on-site and brought on-site), the Contractor shall develop and implement SOP's in accordance with 29 CFR 1910.120(j) and incorporate them in the HASP.

3.14 OPERATIONS WITHIN AND ADJACENT TO POWER LINES

A. Standard Operating Procedures

1. Should site operations include activities requiring the operation of cranes or derricks within or adjacent to power lines, the Contractor shall develop and implement SOP's in accordance with 29 CFR 1926.550(a) - Cranes and Derricks and incorporate them in the HASP.

3.15 OPERATIONS NEAR EXISTING UTILITIES

A. Standard Operating Procedures

1. In advance of the work, the Contractor shall identify and locate buried utilities in the area of work.

2. Special precautions shall be observed to not cause interference or damage to any existing utilities.

3. The Contractor shall notify the proper utility companies at least seventy-two (72) hours before construction is started adjacent to such utilities. Utilities shall be protected in the manner prescribed by the utility company.

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SECTION 02007

PERIMETER AIR MONITORING AND DUST CONTROL PLAN

## PART 1 GENERAL

### 1.1 SUMMARY

A. Control of fugitive dust created as a result of this project shall be the obligation of the Contractor. Notwithstanding the requirements of the Contract Documents, the Contractor shall also comply with the requirements of OSHA 29 CFR 1910.1000.

B. This Section includes the furnishing of all labor, material, and equipment required to prepare and implement a Perimeter Air Monitoring and Dust Control Plan, as specified herein and in accordance with the New York State Department of Health Generic Community Air Monitoring Plan, and Fugitive Dust and Particulate Monitoring Plan.Perimeter Air Monitoring and Dust Control Plan.

C. The Contractor shall hire an independent, third-party firm (not affiliated in any way with the Contractor) to conduct Community Air Monitoring required by this specification and the New York State Department of Health Generic Community Air Monitoring Plan.

### 1.2 APPLICABLE PUBLICATIONS, CODES, STANDARDS, AND SPECIFICATIONS

A. 29 CFR 1910.1000, Air Contaminants

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

C. New York State Department of Health Fugitive Dust and Particulate Monitoring Plan

### 1.3 SUBMITTALS

A. The following items shall be submitted:

1. A Particulate Emission Response Plan shall be prepared and implemented by the Contractor and shall include, but not be limited to, the following:

    a. Preparation of a Particulate Emission Response Plan including mitigation measures, control of operations, emergency measures to be used, monitoring requirements, action levels, etc.
    b. Required particulate monitoring.
    c. Implementation of mitigation efforts, including reasonable suppression techniques.
    d. Proposed remedial actions when particulate action levels are breached.
    e. Quality assurance/quality control (QA/QC) to assure accuracy of monitoring program.

2. The Plan may be subject to review by the NYSDEC prior to acceptance by the Owner’s Representative, Engineer or Owner.

3. The results of monitoring for dust shall be provided to the Engineer on a daily basis.

4. Shop Drawings for air monitoring equipment

PART 2 PRODUCTS

2.1 GENERAL

A. Perimeter Air Monitoring and Dust Control Plan

1. The Perimeter Air Monitoring and Dust Control Plan shall describe in detail the Contractor's plan of operation, means and methods of construction, proposed locations, air monitoring instruments, record keeping procedures and response procedures.

2. The Perimeter Air Monitoring and Dust Control Plan shall describe in detail the Contractor's plan for implementing dust control measures should the action levels specified herein be exceeded.

B. Number and Location of Stations

1. At a minimum, three downwind and one upwind air monitoring stations shall be established by the Contractor to collect data to document the amount, if any, of particulate matter less than 10 microns in diameter (PM10) generated at and leaving the Herkimer Former MGP Site (the Site). Each of the perimeter air monitoring stations shall be located so that it is not shielded or otherwise obstructed from collecting samples representative of the air leaving the Site.

2. The Contractor shall have available on site a spare air monitoring station (for both dust and VOCs) and power pack.

C. Equipment

1. Air monitoring at each station shall be conducted with direct reading instruments for particulates and volatile organic compounds (VOCs).

a. Air monitoring particulate detecting instruments shall be a portable aerosol monitor (TSI 8520 DustTrak or equivalent) equipped with a cyclone adapter to evaluate the presence and concentration of airborne dusts during Site activities.

b. Each community air monitoring system shall include an audible and/or visual alarm that identifies an exceedance of dust or VOC action levels.

c. Both VOC and dust monitoring devices shall be capable of continuous instantaneous (direct reading) readings and recording 15-minute running average.

2. One wind direction monitoring and recording device shall be maintained on the work area. The device shall include a wind direction indicator (wind sock or weathervane) that is visible from all positions of the site or active work area.

3. If the Contractor does not provide an AC power source to air monitoring stations and the wind direction station, the Contractor shall maintain a sufficient supply of charged spare batteries or charged spare units, such that a minimum of three perimeter stations are always in service.

D. Records

1. The readings of the air monitoring instruments shall be recorded at least every 30 minutes during instrument operation. The record of the monitoring shall be available for inspection by the Engineer, the Owner and NYSDEC at the end of the monitoring period.

2. Records of calibration, according to the instrument manufacturer's instructions, shall be maintained by the Contractor and shall be available for inspection by the Engineer, the Owner and NYSDEC.

## PART 3 EXECUTION

### 3.1 GENERAL

A. The Contractor shall implement the Perimeter Air Monitoring and Dust Control Plan that, at minimum, provides a community air monitoring program including sampling and analyses for particulates (PM-10) and volatile organic compounds (VOCs). A total of four community air monitoring stations, each containing monitors for PM-10 and VOCs, shall be established around the perimeter of the site, and shall run continuously during ground intrusive activities.

B. Air monitoring shall be continuous during activities in the active work area. Air monitoring shall begin at least 30 minutes before work begins in the active work area and continue for at least 60 minutes after work ceases. These times are intended to allow for background levels to be established before generation of potential air contaminants and for materials generated during active work to reach the sampling locations.

C. The Contractor shall make every effort to minimize the generation of dust. Appropriate methods to minimize the generation of dust include, but are not limited to:

1. Use of tarpaulin or suitable means to cover exposed contaminated areas and materials.

2. Use embankment material to cover exposed contaminated areas.

3. Limiting the amount of exposed contaminated areas.

4. Water spray. If water spray is used, run-off must be collected and managed as construction water if it comes into contact with relocated soils.

5. The use of chloride or petroleum containing compounds for dust control is prohibited.

D. The Contractor shall update the Perimeter Air Monitoring and Dust Control Plan as necessary to incorporate changes in site conditions, equipment and potentially hazardous materials identified during site activities. The Contractor's Perimeter Air Monitoring and Dust Control Plan shall include alternate monitoring locations and relocation procedures to accommodate site construction activities.

3.2 ACTION LEVELS

A. Actions to control the generation or release of site contaminants are required if the difference between the downwind and upwind/background concentrations exceed the following action levels:

1. 5 ppm for VOCs

2. 100 $\mu g/m^3$ for PM-10 for a 15-minute average

B. If the downwind PM10 level exceeds 150 micrograms above background of PM10 per cubic meter of air (150 $\mu g/m^3$) for more than 15 minutes, dust control activities at the active site shall be initiated to reduce the level at the perimeter to below 100 $\mu g/m^3$ within 15 minutes.

C. If the VOC level at the perimeter of the work area is above 25 ppm, activities must be shutdown and actions taken by the Contractor to reduce VOC levels at the perimeter of the work zone to below 5 ppm above background.

3.3 REPORTING

A. The Contractor shall maintain a written copy of the 15-minute running average concentrations for both PM-10 and VOCs for each workday, to be available by 10:00 AM the following workday. Written documentation shall include an appropriately scaled map of the work area depicting community air monitoring locations, wind direction, and others pertinent meteorological data, date, time, instrumentation readings, calibration records, applicable standards, and engineering controls implemented (if necessary).

B. The Contractor shall prepare and provide the Owner/Engineer a weekly summary of the 15-minute running average concentrations for both PM-10 and VOCs, in format suitable for presentation to the NYSDEC.

C. In the event of an exceedance of a community air monitoring action level, the Contractor shall immediately notify the Engineer and National Grid via telephone. NYSDEC will be notified by National Grid/Engineer. The Contractor shall send a follow up email to National Grid/Engineer within 12 hours of the observed exceedance summarizing the data, the cause of the exceedance, and any corrective measures to be implemented as a result of the exceedance. Within 24 hours of the observed exceedance, National Grid/Engineer will send an email to NYSDEC and NYSDOH which summarizes: 1) the community air monitoring data; 2) the cause of the exceedance; and 3) any corrective actions implemented or to be implemented as a result of the exceedance. This information will also be documented by the Contractor in the weekly CAMP report.

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SECTION 02009

PROJECT PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, materials, and equipment as required to provide the services of a photographer to provide digital color photographs of the progress of the project.

PART 2 PRODUCTS

2.1 GENERAL

A. The photographs shall be provided on Compact Disc furnished to the Engineer within two (2) weeks.

1. All photographs shall be numbered and tagged with date taken, project name and number, description and photographer's name.

PART 3 EXECUTION

3.1 GENERAL

A. (24) photographs shall be taken each month for the duration of the Contract at the time and locations as directed by the Engineer.

1. Only one day's notice shall be required for any photographs to be taken.

B. A minimum of (48) photographs shall be taken of preconstruction and final construction. The final photographs shall be taken from the same locations as the preconstruction photographs.

C. Upon the completion of the project, the Contractor shall submit a complete electronic file of the project photographs to the Engineer.

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SECTION 02110

STORMWATER POLLUTION PREVENTION

PART 1 GENERAL

1.1 SUMMARY

A. Implementation of the Erosion and Sediment Control Plan (ESCP) prepared by the Engineer and approved by the NYSDEC, as specified herein and in accordance with all provisions of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02141 - Construction Water Management

B. 02211 – Clearing and Grubbing

C. 02221 – Earthwork

D. 02270 – Erosion and Sediment Control

1.3 SPECIAL REQUIREMENTS

A. Erosion control shall consist of operations performed to minimize erosion of soils and sedimentation of drainage channels and lands adjacent to or affected by the Work, to prevent stormwater run-on onto work areas, and to prevent potentially contaminated stormwater run-off (including soils and sediment) from leaving the site without appropriate treatment.

B. Erosion control measures to be implemented shall be in accordance with this specification and as may be required by the NYSDEC or local agency having jurisdiction. In the event of discrepancies between requirements of this specification or government agency, the more stringent requirements shall govern.

C. Construction procedures shall include protection of the environment in accordance with all pertinent Federal, State and local regulations. Construction procedures that are prohibited in the undertaking of work associated with this project include, but are not limited to:

1. Pumping of silt-laden water from excavations into any surface waters, any stream corridors, stormwater conveyances, or sanitary sewers unless specifically permitted by the Owner and applicable regulatory agencies.

2. Damaging vegetation beyond the extent necessary for the work of this project.

3. Dumping of spoil material into any unspecified or unapproved locations.

D. The Engineer shall have the authority to limit the surface area exposed by clearing, grubbing and excavation, and to direct the Contractor, at no additional cost to the

Owner, to implement additional erosion, run-off and run-on control measures as the Engineer deems necessary.

E. The Contractor shall provide all means, methods, equipment, facilities, and personnel required to implement and maintain the ESCP.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

A. Clearing and Site Preparation

1. Only those portions of the site necessary and essential to be cleared for work shall be cleared. Clearing schedules shall be formulated to provide minimum practical exposure of soils. Local run-on/run-off control measures shall be implemented as conditions warrant. The Contractor shall make every reasonable effort so as to not unduly disturb the ecological or environmental quality of the area.

B. Erosion and Sediment Control

1. During the land disturbance period of this project, the following construction schedule shall be adhered to:

a. Clearing and grubbing for those areas necessary for installation of perimeter controls.

b. Construction of perimeter controls including, but not necessarily limited to, the installation and maintenance of silt fencing along the entire downgradient perimeter beyond the outer limits of potential set-up and work areas.

c. Remaining clearing and grubbing.

d. Excavation, providing temporary stabilization/erosion/run-off/run-on controls as required.

e. Final grading and permanent stabilization.

f. Removal of perimeter controls.

2. Erosion and sediment control measures may include straw bale dikes, silt fences, earth dikes, stone check dams, stone outlet sediment traps, stabilized construction entrances, rip rap, seeding/sodding, properly anchored mulch, and/or other measures as required.

3. Erosion and sediment control measures shall be properly maintained and adequately functioning. Erosion control devices shall be inspected at a minimum of at least once per week. Any existing measures that are damaged shall be immediately repaired.

4. Excavated material shall be protected from erosion by using appropriate devices or stabilization.

5. Trapped sediment shall be removed from the area of deposition and disposed of in accordance with the Section “Earthwork”.

6. Silt fencing shall be placed along the down gradient perimeter of the site at the approximate limit of the work or as directed by the Engineer.

7. Stormwater removed from the excavations shall be managed in accordance with the section entitled "Construction Water Management."

C. Maintenance of Site Drainage during Construction

1. The Contractor shall provide and maintain slopes, crowns and ditches in or around all excavations to insure satisfactory surface drainage at all times. Ditches and other drainage facilities necessary to remove ponded water shall be constructed as soon as practical to have the work area dry during the progression of work. All existing culverts and drainage systems shall be maintained in satisfactory operating condition throughout the course of the work unless otherwise directed by the Engineer. If it is necessary to interrupt existing surface drainage, then temporary drainage facilities shall be provided until the permanent drainage work is complete.

2. The maintenance of the drainage facilities is to include removal of silt build up, removal of mulch damming and removal of all drainage facility obstructions as determined by the Engineer.

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SECTION 02141

CONSTRUCTION WATER MANAGEMENT

PART 1 GENERAL

1.1 WORK INCLUDED

A. The Contractor shall develop an acceptable Construction Water Management Plan detailing the handling, storage, treatment, and disposal of all construction water and associated residuals (*e.g.* spent GAC, filter bags, etc) generated during construction in accordance with all applicable Federal, State, and local regulations.

B. The Contractor shall design, construct, and operate a construction water treatment plant (CWTP) as necessary to comply with the discharge limits of the Discharge Requirements and Limits established by the Village of Herkimer Publically Owned Treatment Works (POTW) (copy attached following this Technical Specification) for discharge to the sanitary sewer. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the sole responsibility of the Contractor.

C. The Contractor shall provide all labor, materials, and equipment required for handling, storage, treatment, and disposal of construction water in accordance with the approved Construction Water Management Plan. At minimum, the Contractor shall provide means to remove, treat, and properly dispose 300,000 gallons of groundwater from the excavation each day, including weekends and other non-work days, for the duration of Contract work. Pumps, pipe and treatment processes provided shall be operated continuously to maintain a dry excavation. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week. Minimally, the CWTP shall include the following:

1. A closed top influent or flow equalization tank (e.g. 42,000 gallons +/- Frac tanks) for receiving and temporarily holding construction water pending treatment by the Contractor.

2. Bag filters for removing fine suspended solids

3. Granular activated carbon filters for removal of volatile and semi-volatile organic compounds

4. An effluent tank for receiving and temporarily holding treated water (e.g. 21,000 gallons +/- Frac tank)

5. Effluent flow meter with totalizing meter

D. The Contractor is responsible for providing any additional equipment that the Contractor believes is necessary for the treatment of construction water at no additional cost to National Grid.

E. The Contractor shall perform all specified and necessary sampling and analyses to insure compliance with the approvals and conditions for acceptance provided by the Village of Herkimer POTW, and applicable laws and regulations or as directed by Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02110 - Storm Water Pollution Prevention Plan

B. 02221 - Earthwork

C. 02241 - Off-Site Transportation and Disposal

1.3 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. The Contractor shall comply with applicable Federal, State and local codes, ordinances, regulations, statutes and standards.

1.4 SUBMITTALS

A. The following items shall be submitted:

1. Construction Water Management Plan

2. Shop drawings and test results used in design of the method of handling construction water.

3. Process and instrumentation drawings (P&IDs) and schematic of proposed construction water collection, storage, and treatment process.

4. Implementation schedule for the dewatering operation and the proposed construction water treatment and discharge.

5. Results of all analytical work and final report of dewatering activities completed.

1.5 DEFINITIONS

A. Construction Water. Construction water shall be defined as the following:

1. Groundwater or surface water entering the excavations.

2. Surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris.

3. Water or other liquids drained from or which have come into contact with potentially contaminated waste, soils or debris, in addition to that resulting from precipitation.

4. Equipment decontamination liquid.

PART 2 PRODUCTS

2.1 GENERAL

A. Construction Water Management Plan

1. Shallow groundwater in the vicinity of the excavations is impacted by manufactured gas plant (MGP) constituents. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) including benzene and polynuclear aromatic hydrocarbons (PAHs) typical of former MGP operations were detected. The groundwater also contained dissolved solids and metals, and exhibited measurable oil & grease.

2. The Contractor shall submit to the Engineer a plan for managing construction water. The plan shall include, but not be limited to, the Contractor's proposed method of handling, storage (if necessary), treatment, sampling and analyses, and disposal of construction water generated during construction. In developing plans to treat construction water which the Contractor will generate, the information available in the following documents, which are not a part of this Contract and a cited for reference only, should be considered and provision provided by the Contractor to appropriately handle and treat the construction water to comply with the discharge limits established by the Village of Herkimer POTW for the project:

- TRC, 2003. *Initial Site Characterization/Interim Remedial Measure (IRM) Study*, Niagara Mohawk – A National Grid Company Former MGP Site, Herkimer New York.
- TRC, 2005. *Supplemental Site Characterization*, National Grid Herkimer (Smith Street) Non-Owned Manufactured Gas Plan (MGP) Site.
- TRC, 2009. *Remedial Investigation Report*, Herkimer Former MGP Site, West Smith Street Herkimer, NY, Site # V00471-6.
- O'Brien & Gere, 2010. *Herkimer Former MGP Site, National Grid, Additional Pre-Design Activities*, (Letter), August 4, 2010.
- O'Brien & Gere, 2011, *Herkimer Former MGP Site, National Grid* (Letter), June 24, 2011.

3. The Contractor shall be responsible for the design and operation of a construction water treatment plant (CWTP), recognizing that subsurface conditions described in the documents referenced above and influent water quality may differ significantly from prior observations made or historic groundwater quality as a result of the Contractor's construction activity (*e.g*. suspended solids) and disturbing the non-aqueous phase liquid (NAPL) and tar-impacted soil.

4. The sludge and sediments generated by the Contractor's management of construction water shall be managed in accordance with the Sections "Earthwork" and "Off-site Transportation and Disposal".

B. Facilities

1. The Contractor shall provide methods, means, and facilities required to manage construction water and residuals generated during construction water management.

C. Equipment

1. The Contractor shall provide equipment and personnel to manage construction water.

PART 3 EXECUTION

3.1 GENERAL

A. It shall be the responsibility of the Contractor to investigate and comply with all applicable Federal, State, and local laws and regulations governing the handling, storage and disposal of construction water. All construction water shall be disposed of in a manner which meets the requirements for discharge established by the Village of Herkimer POTW and other applicable permit requirements, laws, and regulations.

B. The Contractor shall obtain all required permits, manifests, and approvals required for the handling, storage, transport, treatment and disposal of residuals generated during construction water management.

C. Any sampling and analyses necessary to protect the health and welfare of the Contractor's employees and/or agents and/or to characterize collected water, treated water, or residuals shall remain the sole responsibility of the Contractor.

D. The Contractor is responsible for system maintenance including replacement and disposal of filter bags and granular activated carbon. The Contractor shall also be responsible for collecting and analyzing samples from between process vessels for the purpose of monitoring their operations and gauging potential for breakthrough, performing the necessary maintenance when necessary to prevent such occurrence.

E. Construction water shall be handled using equipment compatible with anticipated contaminants that may be present.

3.2 DISCHARGE TO SANITARY SEWER

A. No construction water shall be discharged to any sanitary sewer conveyance unless it meets all Discharge Requirements and Limits established by the Village of Herkimer POTW. The Contractor shall include specific discharge criteria including limits on flow rates, daily volume, and chemical and solids concentrations and daily loading to the POTW in the Construction Water Management Plan.

B. All testing required for discharge to any sanitary sewer shall be the responsibility of the Contractor.

## 3.3 MINIMIZATION OF CONSTRUCTION WATER

A. The Contractor shall make every effort to minimize the generation of construction water and associated sediments and sludges. Methods to minimize generation of construction water include, but are not limited to:

1. Limiting the size of open excavation as necessary to allow the excavation to be dewatered and not exceed the hydraulic capacity or treatment capacity of the construction water treatment plant or the receiving sanitary sewer and POTW.

2. Use of low permeability tarpaulin or suitable means to cover exposed contaminated areas and materials.

3. Grading to control run-on and run-off.

4. Engineering controls on construction activities to minimize contact of personnel and equipment with contaminated areas thus minimizing the amount of decontamination required and other appropriate methods.

## 3.4 VERIFICATION TESTING

A. The Contractor will collect samples of the treated water for analyses on the frequency required by the Village of Herkimer POTW to document that the criteria for discharge are met. If these criteria are not met, the Engineer may require the Contractor to reduce the dewatering pumping to a rate consistent with the capacity of the treatment system and/or shutdown the treatment system and perform necessary adjustments or modifications to achieve the discharge requirements.

B. The analyses of the samples shall be performed by an independent laboratory certified by the State of New York, retained by the Construction Contractor, with a 48-hour turnaround. If discharge criteria of the Village of Herkimer POTW are not met, the Contractor may be required to shut down the treatment system and perform the necessary adjustment or modifications to achieve the discharge requirements. The Contractor will be responsible for all costs associated with system modifications or work delays related with the failure of the treatment system to meet discharge requirements.

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SECTION 02145

GROUNDWATER MONITORING WELL DECOMMISSIONING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, equipment and performing all operations required in the decommissioning of the groundwater monitoring wells, as specified herein, shown on the Contract Drawings or as specified by the Engineer.

| Monitoring Wells to be Decommissioned | | |
|---|---|---|
| Well Identification | Well Diameter (inches) | Depth of Boring (ft below ground surface) |
| KW-01 | 2 | 17 |
| KW-02 | 2 | 20 |
| MW-01 | 2 | 18 |

B. Decommissioning of any groundwater monitoring wells damaged during the work as directed by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02141 - Construction Water Management

B. 02221 – Earthwork

1.3 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

The publications listed below form a part of the specifications to the extent referenced. The publications are referred to in the text by basis designation only.

A. American Society of Testing and Materials (ASTM)

ASTM C150 Type 1 Portland cement

ASTM D5299 Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and other Devices for Environmental Activities

B. New York State Department of Environmental Conservation (NYSDEC)

NYSDEC CP-43 Groundwater Monitoring Well Decommissioning Policy (November 3, 2009)

NYSDEC Groundwater Monitoring Well Decommissioning Procedures (June 2009), or more recent version.

1.4 SUBMITTALS

A. The following items shall be submitted:

1. Proposed grouting materials and methods.

2. Well decommissioning logs shall be submitted.

PART 2 PRODUCTS

2.1 GROUT

A. There are two types of grout mixes that may be used to seal wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard grout mix is possible (e.g. highly-fractured bedrock or coarse gravels).

B. Standard Grout Mixture

1. Unless otherwise necessary, the following standard mixture shall be used:

a. One 94-lb bag Type I Portland Cement
b. 3.9 lbs powdered bentonite
c. 7.8 gals potable water

2. This mixture results in a grout with a bentonite content of four percent by weight, and shall be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases, a special mixture shall be used.

C. Special Mixture

1. In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture shall be used:

a. One 94-lb bag type I Portland Cement
b. 3.9 lbs powdered bentonite
c. 1 lb calcium chloride
d. 6.0 – 7.8 gallons potable water (depending on desired thickness)

2. The special mixture results in a grout with a bentonite content of four percent by weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture. The least amount of water that can be added for the mixture to be readily pumpable is six gallons per 94-lb bag of cement.

3. In cases where the penetration of the sandpack is critical, such as bedrock wells with screens that transect multiple water-bearing zones, the following alternate mixture shall be used:

a. One 94-lb bag Type III Portland Cement
b. 3.9 lbs powdered bentonite
c. 7.8 gals potable water

2.2 BENTONITE

A. Baroid - Ben Seal

B. Equal

PART 3 EXECUTION

3.1 GENERAL

A. No monitoring well decommissioning, repair or replacement activities shall commence without acceptance of the Engineer. Prior to decommissioning monitoring wells, the wells shall be bailed and the volume of accumulated non-aqueous phase liquid (NAPL) (if any) shall be quantified. If NAPL is observed, the quantity removed shall be reported to the Engineer for inclusion in the Construction Completion Report.

B. All monitoring well decommissioning shall be performed in accordance with the requirements of the NYSDEC Groundwater Monitoring Well Decommissioning Procedures (June 2009), or more recent version.

C. Water generated and/or encountered during well abandonment activities shall be handled in accordance with the Section "Construction Water Management."

D. Soil cuttings shall be disposed of as “spoil” in accordance with the Section “Earthwork.” All other material shall be disposed of off-site in accordance with applicable Federal, State and local regulations.

E. The Contractor shall restore the area in the vicinity of each well location as directed by the Engineer.

F. Following drilling activities, the Contractor shall decontaminate equipment as specified in Section 3.3.

G. If the well to be decommissioned is constructed within a bedrock formation, the screened or the open hole portion of the well shall be grouted to the top of the bedrock. Prior to initiating any grouting procedure, the depth of the well shall be measured to determine if any silt or debris infilling has plugged the well. If plugging has occurred, the well shall be flushed with an appropriately sized roller bit or drill rods to remove or suspend the obstruction in the water column. The borehole shall then be tremie grouted from the bottom of the well to the top of bedrock to insure a continuous grout column. Note that if the bedrock well is cased, the screen should be perforated to the top of the rock if the inside diameter of the casing is 4-inches or larger. Furthermore, if the screened interval transects multiple water bearing zones, the special grout mix discussed in Part 2 shall be used to ensure penetration of the sand pack. After the rock hole is grouted, the overburden portion of the well shall be decommissioned in accordance with the following sections.

3.2 DECOMMISSIONING

A. Removing the Protective Casing

1. Removal of the protective casing of a well must not interfere with or compromise the integrity of decommissioning activities performed at the well.

2. Prior to Sealing the Well Bore

a. The protective casing must be removed unless the drilling tools have an inside diameter larger than the protective casing. An acceptable protective casing removal method involves breaking up the concrete seal surrounding the casing and jacking or hoisting the casing out of the ground. A check should be made during pulling to insure that the inner well casing is not being hoisted with the protective casing. If this occurs, the well casing shall be cut off after the base of the protective casing is lifted above the land surface.

B. Overdrilling

1. An overdrilling method of well decommissioning shall be used to prevent cross-contamination. The overdrilling method used shall:

a. Follow the original well bore.
b. Create a borehole of the same or greater diameter than the original boring.
c. Remove of all the well construction materials.

2. Acceptable methods for overdrilling include the following:

a. Using conventional augering (i.e., a hollow stem auger fitted with a plug). The plug cutter shall grind the well construction materials, which shall be brought to the well surface by the auger.

b. Using a conventional cable tool rig to advance casing having a larger diameter than the original boring. The cable tool kit shall be advanced within the casing to grind the well construction materials and soils, which are periodically removed with large diameter bailer. This method is not applicable to bedrock wells.

c. Using an over-reaming tool with a pilot bit nearly the same size as the inside diameter of the casing and a reaming bit slightly larger than the original borehole diameter. This method can be used for wells with steel casings. Using a hollow-stem auger with outward facing carbide cutting teeth having a diameter two to four inches larger than the casing. Outward-facing cutting teeth should prevent severing the casing and drifting off center.

d. Using a hollow-stem auger with a steel guide pipe inside. The casing guides the cutter head and remains inside the auger. The guide pipe

should be firmly attached to the inside of the casing by use of a packer or other type of expansion or friction device.

3. Prior to overdrilling, an expandable J-plug or other suitable well cap shall be used to prevent the introduction of soil or cuttings into the well, thereby ensuring a continuous grout column for wells that are grouted in place.

4. In all cases above, overdrilling shall advance through the original bore depth by a distance of 0.5 feet to ensure complete removal of the construction materials. When the overdrilling is complete, the casing and screen should be retrieved from the center of the auger (American Society for Testing and Materials, Standard D 5299), if one of the hollow stem auger methods described above is employed.

5. Subsequent to overdrilling at flush mount well locations where it may be impractical to remove well materials from inside the augers, a 1-2 foot deep area shall be excavated by hand around the flush-mount well to facilitate a conventional well removal while tremie-grouting inside the well. Alternatively, the soil within the annular space may be removed by raising the augers to allow the soil to fall out and re-advance the augers to the original target depth. Grout shall then be tremied within the annular space between the augers and well casings. The grout level in the borehole shall be maintained as the drilling equipment and well materials are sequentially removed.

6. After overdrilling is completed, the borehole shall be grouted and the upper five feet of borehole shall be restored.

C. Grout Placement

1. Grout shall be placed in the borehole from the bottom to the top using a tremie pipe of not less than 1-inch diameter. Grout shall then be pumped into the borehole until the grout appears at the land surface (when grouting open holes in bedrock, the grout level only needs to reach above the bedrock surface).

2. When the grout level stabilizes, casing or augers shall be removed from the hole. As each section is removed, grout shall be added to keep the level between 0-feet and 5-feet below land surface. If the grout level drops below the land surface to an excessive degree, an alternate grouting method must be used.

3. Upon completion of grouting, the Contractor shall insure that the final grout level is approximately five feet below land surface. A ferrous metal marker shall be embedded in the top of the grout to indicate the location of the former monitoring well.

D. Backfilling

1. The uppermost five feet of the borehole at the land surface shall be filled with a material physically similar to the natural soils.

## 3.3 EQUIPMENT DECONTAMINATION REQUIREMENTS

A. To avoid cross-contamination, equipment shall be decontaminated after operations at each well location are complete.

B. The drilling and excavation equipment (i.e., drill rigs, cutting bits, and associated equipment) shall be cleaned at a constructed decontamination facility.

C. The drilling and excavation equipment shall be prepared before it is brought to the decontamination facility and then cleaned at the facility. Preparation includes removing gross soil/rock from the equipment to minimize losses during movement to the decon pad. At the decontamination facility, the equipment shall be steam cleaned or washed using phosphate-free detergent then rinsed. The equipment shall be inspected by the Engineer's field representative after cleaning.

D. All solid waste materials generated during the decommissioning process shall be disposed of properly.

* * * * *

SECTION 02211

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes clearing and grubbing by removal or destruction of trees, underbrush, logs, stumps, decayed or growing organic matter above the surface of the ground. This section also includes the removal of snow and ice which interfere with construction or landscaping.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

B. 02241 – Off-Site Transportation and Disposal

PART 2 PRODUCTS

2.1 GENERAL

A. Contractor shall protect existing trees outside of the excavation limits and trees surrounding the excavations required to complete the remedial actions with suitable stakes or protective measures.

PART 3 EXECUTION

3.1 GENERAL

A. Only those portions of the site necessary and essential to be cleared for work shall be cleared.

B. Tree protection

1. No trees located outside of the excavation limits shall be disturbed unless necessary to complete the excavations required as part of the remedial actions.

2. Any tree, which will not, in the opinion of the Engineer, hinder construction or landscaping, shall be protected.

3. Special care shall be exercised to minimize injury to trees that will not be removed. Careful digging will be performed to minimize root damage. Roots may be cut and removed up to 25 percent of the estimated root area. If more than 25 percent is required to be cut, the Engineer shall decide whether the tree shall be removed. Straggling roots shall be pruned.

4. Any tree that is trimmed during construction shall be cut cleanly outside of the branch collar.

C. Removal of brush, trees and spoil

1. Contractor may chip brush and tree limbs. The Contractor shall dispose of all brush, trees, wood chips, logs, cut limbs and similar material off-site at an Owner-approved facility.

2. The cutting of trees and shrubs shall be six inches above the ground surface for clearing in the known contaminated areas. Anything below this height should be considered grubbing, and associated soils shall be handled as contaminated soils and handled in accordance with the Sections titled “Earthwork” and “Off-site Transportation and Disposal.”

3. No brush, trees, peat or other organic material shall be placed on site or used as backfill in any excavations.

* * * * *

SECTION 02221

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Excavation of soils from the former Herkimer Manufactured Gas Plant (MGP) site to the limits shown including the loosening, removing, segregating, transporting, and storage on-site of all materials classified as "earth" or "spoil" necessary to be removed for the construction and completion of all work under the Contract, including but not limited to:

1. Excavation of the surface 2-ft layer (0 to 2 ft below ground surface [bgs]) of "earth", and excavation of "earth" below a depth of 2 ft bgs where shown that does not exhibit MGP impact (visual or olfactory), and temporary stockpiling of this excavated "earth" on site. This excavated material shall be used as backfill for the excavation, below a depth of 2 ft bgs.

2. Excavation of "earth" or "spoil" containing visible tar or non-aqueous phase liquid (NAPL) at the former MGP site to the depth shown on the Contract Drawings or directed by the Engineer, and transportation of the material containing visible tar or NAPL to a licensed or permitted off-site disposal facility selected by National Grid based on waste characterization samples collected and analyzed by the Contractor in accordance with the Section 02241 – Off Site Transportation and Disposal.

3. Excavation of "earth" or "spoil" exhibiting sheen, staining, or other indication of MGP impact, but not containing tar or NAPL, and transportation and disposal of the material off-site to a licensed or permitted off-site disposal facility selected by National Grid based on waste characterization samples collected and analyzed by the Contractor for treatment and/or disposal in accordance with the Section 02241 – Off Site Transportation and Disposal.

B. The demolition and removal of former structures within the limits of excavation shown, and disposal of construction debris (e.g. removed asphalt, concrete, abandoned pipe) off-site at an Owner-approved facility licensed or permitted to receive waste material of this type.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02141 - Construction Water Management

B. 02223 – Embankment

C. 02225 – Structural Excavation, Backfill and Compaction

D. 02231 – Select Fill

E. 02241 – Off-Site Transportation and Disposal

F. 02400 – Steel Sheet Piling

G. 02503 – Restoration of Surfaces

H. 02981 – Topsoil and Seeding

1.3 DEFINITIONS

A. Excavation (or Trenching)

1. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.

2. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same.

3. All diking, ditching, fluming, cofferdamming, pumping, bailing, draining, well pointing, or otherwise disposing of water.

4. The removing and disposing of all surplus materials from the excavations in the manner specified.

5. The maintenance, accommodation and protection of travel and the temporary paving of highways, roads and driveways.

6. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property in the vicinity of the work, whether over- or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other injury.

7. All temporary bridging and fencing and the removing of same.

B. Earth

1. All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders or masonry larger than one-half cubic yard in volume.

C. Backfill

1. The refilling of excavation and trenches to the line of filling indicated on the Contract Drawings or as directed using materials suitable for refilling of excavations and trenches; and the compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required.

D. Spoil

1. Surplus excavated materials not required or not suitable for backfills or embankments.

E. Embankments

1. Fills constructed above the original surface of the ground or such other elevation as specified or directed.

F. Limiting Subgrade

1. The underside of the pipe barrel for pipelines

2. The underside of footing lines for structures

G. Excavation Below Subgrade

1. Excavation below the limiting subgrades of structures or pipelines.

2. Where materials encountered at the limiting subgrades are not suitable for proper support of structures or pipelines, the Contractor shall excavate to such new lines and grades as required.

1.4 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

The publications listed below form a part of the specification to the extent referenced. The publications are referred to in the text by basis designation only.

A. American Society for Testing and Materials (ASTM)

| | |
|---|---|
| ASTM D698-91 | Test Method for Laboratory Compaction Characteristics of Soil using Standard Effort |
| ASTM D1556-90 | Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method |
| ASTM D1557-91 | Test Method for Laboratory Compaction Characteristics of Soil using Modified Effort |
| ASTM D2922-91 | Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) |

B. Method 9095 (Paint Filter Test), “Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods” (EPA pub. No. SW-846)

1.5 SUBMITTALS

A. The following items shall be submitted:

1. A description, submitted for Engineer review, of the manner in which the excavation spoils will be segregated and stockpiled pending results of characterizations to determine if the material should used as backfill on site below a depth of 2 ft bgs or sent off-site. The Contractor work plan shall also describe the manner in which the former structure remnants will be handled by them.

PART 2 PRODUCTS

2.1 MATERIALS AND CONSTRUCTION

A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.

2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

3. Sheeting and bracing to be left-in-place shall be pressure treated in accordance with ASTM D1760 for the type of lumber used and with a preservative approved by the Engineer.

B. Steel Sheeting and Bracing

1. Shall be sound

2. Shall conform to ASTM A328 with a minimum thickness of 3/8 inch.

3. Shall be in accordance with technical specification 02400 Steel Sheet Piling.

2.2 DEWATERED SOIL

A. The wastes, prior to hauling off-site, shall be absent of free liquids as defined by the Paint Filter Test and have a moisture content of less than 25%.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavation activities shall be conducted using excavation equipment (e.g. excavator, backhoe, etc) and methods determined by the Contractor and outlined in the Contractor’s required submittals.

B. The Contractor shall excavate soils and debris (e.g. brick, concrete, piping, etc) to the horizontal and vertical limits identified on the Contract Drawings or as directed by the Engineer.

C. The Contractor is responsible for providing safe and adequate vehicle/equipment access and egress to the excavation areas to facilitate the excavation of materials to the horizontal and vertical limits identified on the Contract Drawings or as directed by the Engineer.

D. Excavated materials that are unsuitable for use as backfill material, as determined by the Engineer, will be transported to an appropriate facility off-site in accordance with the Section 02241 – Off-Site Transportation and Disposal.

E. In the event that any characterization results or field observations indicate that certain materials are unsuitable for use on site as backfill, the Contractor shall arrange for off-site disposal at an Owner-approved facility(ies) in accordance with applicable rules and regulation, local flow control regulations, and the Waste Management Plan prepared for National Grid for the former Herkimer Manufactured Gas Plant Site.

3.2 UNAUTHORIZED EXCAVATION

A. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.

B. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.3 REMOVAL OF WATER

A. General

1. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work. All such water shall be handled in accordance with the Technical Specification Section 02141 - “Construction Water Management”.

2. Unless otherwise specified, all excavations which extend down to or below the static groundwater elevations shall be dewatered by lowering and maintaining the groundwater beneath such excavations at all times.

3. Where the presence of fine grained subsurface materials and a high groundwater table may cause the upward flow of water into the excavation with a resulting quick or unstable condition, the Contractor shall install and operate a well point system to prevent the upward flow of water during construction.

4. Water pumped or drained from excavations, or any sewers, drains or water courses encountered in the work, shall be disposed of in an appropriate

manner without injury to adjacent property, the work under construction, or to pavements, roads, drives, and water courses.

5. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

B. Work Included

1. The construction and removal of cofferdams, sheeting and bracing, and the furnishing of materials and labor necessary therefor.

2. The excavation and maintenance of ditches and sluiceways.

3. The furnishing and operation of pumps, well points, and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

C. Well Point Systems

1. Installation

a. The well point system shall be designed and installed by or under the supervision of an organization whose principal business is well pointing and which has at least five consecutive years of similar experience and can furnish a representative list of satisfactory similar operations.

b. Well point headers, points and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation and construction of other structures.

c. Detached observation wells of similar construction to the well points shall be installed at intervals of not less than 50 feet along the opposite side of the excavation from the header pipe and line of well points, to a depth of at least 5 feet below the proposed excavation. In addition, one well point in every 50 feet shall be fitted with a tee, plug and valve so that the well point can be converted for use as an observation well. Observation wells shall be not less than 1 ½ inches in diameter.

d. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week.

2. Operation

a. Where well points are used, the groundwater shall be lowered and maintained continuously (day and night) at a level not less than 2 feet below the bottom of the excavation. Excavation will not be

permitted at a level lower than 2 feet above the water level as indicated by the observation wells.

b. The effluent pumped from the well points shall be examined periodically by qualified personnel to determine if the system is operating satisfactorily without the removal of fines.

c. The water level shall not be permitted to rise until construction in the immediate area is completed and the excavation backfilled.

3.4 STORAGE OF MATERIALS

A. Sod

1. Any sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth. Sod damaged while in storage shall be replaced in like kind at the sole expense of the Contractor.

B. Topsoil

1. Topsoil suitable for final grading shall be removed and stored separately from other excavated material.

C. Excavated Materials

1. The Contractor shall construct temporary staging areas for the handling, dewatering, and staging of excavated materials prior to the transportation of such materials to the off-site treatment/disposal facility. The staging areas shall be constructed in accordance with the Remedial Design and the Contractor's submittal.

2. All excavated materials shall be stored in locations so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders.

3. The location and construction of the material staging areas (and construction water treatment system area) shall be subject to the following requirements:

a. Based on Site conditions, the Owner may elect to limit the maximum allowable stockpile size. Limitations to stockpile size shall not result in additional expense to the Owner.

b. The Contractor shall be responsible for determining the number and location of material staging areas with the project work limits (subject to Owner and Engineer approval). The Contractor shall identify the number and locations of material staging area in its work plans.

c. The soil will be placed onto a 40-mil LLDPE impermeable liner of sufficient strength and thickness to prevent puncture during use. Each

side of the impermeable liner will be protected with non-woven geotextile fabric. The placement of soil into the staging area(s) will not involve any equipment or procedures that may jeopardize the integrity of the underlying impermeable liner.

d. The staging and containment area(s) shall be sloped and equipped with a sump to collect liquids generated within these areas. The Contractor shall remove liquids that accumulate within the sump to a temporary storage tank. The liquids shall be handled in accordance with Section 02141 - "Construction Water Management".

e. A berm shall be constructed around the perimeter of the staging and containment areas to contain liquid generated within these areas and to mitigate the potential for surface water runoff to contact stockpiled materials.

f. All stockpiled excavated materials shall be securely covered with a minimum 10-mil thick polyethylene sheeting when no materials are being placed or removed during the work as well as non-work hours. The cover shall be properly anchored to prevent uplift due to wind conditions and shall be maintained for the duration of staging activities. In addition, emission controls (e.g. BioSolve, vapor-suppressant foam, or approved equivalent) shall be employed, as necessary, when materials are being actively placed, mixed, or removed.

4. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.

## 3.5 SHEETING AND BRACING

### A. Installation

1. The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, structures, or other work; diminish the width necessary for construction; otherwise damage or delay the work of the Contract; endanger existing structures, pipes or pavements; or cause the excavation limits to exceed the right-of-way limits.

2. In no case will bracing be permitted against pipes or structures in trenches or other excavations.

3. Sheeting shall be driven as the excavation progresses, and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertically with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position. Seepage which carries fines through the sheeting shall be plugged to retain the fines.

4. Where breast boards are used between soldier piles, the boards shall be back packed with soil to maintain support.

5. The Contractor shall be solely responsible for the adequacy of all sheeting and bracing. Sheeting and bracing shall be designed and installed so to be able to support the excavation sides in an excavation "dry" and "flooded" condition.

B. Removal

1. In general, all sheeting and bracing, whether of steel, wood or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or structural foundation shall not be withdrawn, unless otherwise directed, before more than 6 inches of earth is placed above the top of the pipe or structural foundation and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

2. The Contractor shall not remove sheeting and bracing until the work has attained the necessary strength to permit placing of backfill.

C. Left in Place

1. If, to serve any purpose of his own, the Contractor files a written request for permission to leave sheeting or bracing in the trench or excavation, the Engineer may grant such permission, in writing, on condition that the cost of such sheeting and bracing be assumed and paid by the Contractor.

2. The Contractor shall leave in place all sheeting, shoring and bracing which are shown on the Contract Drawings or specified to be left in place or which the Engineer may order, in writing, to be left in place. All shoring, sheeting and bracing shown or ordered to be left in place will be paid for under the appropriate item of the Contract. No payment allowance will be made for wasted ends or for portions above the proposed cutoff level which are driven down instead of cut-off.

3. In case sheeting is left in place permanently, it shall be cut off or driven down as directed so that no portion of the same shall remain within 12 inches of the street subgrade or finished ground surface.

## 3.6 DEBRIS PROCESSING/MATERIAL SEGREGATION

A. The potential exists for encountering brick, concrete, drainage features (e.g. abandoned piping, culverts, etc), tree stumps/root balls, and other debris at the Site. The Contractor shall be responsible for segregating debris into that which is suitable for off-site treatment/disposal and that which requires off-site disposal. Debris that is not suitable for off-site treatment or disposal due to size (e.g. concrete, cobbles/boulders, miscellaneous debris) shall be reduced into a manageable size so as to be suitable for off-site disposal (as determined by the off-site disposal facility).

Materials such as tree stumps/root balls shall be subject to appropriate off-site disposal. In the event that free liquids are encountered with such structures, the Contractor shall collect, containerize, characterize and appropriately dispose of such materials.

B. If NAPL is encountered during the excavation activities, the NAPL shall be removed and transferred to an appropriate container(s) for characterization to determine off-site treatment/disposal requirements.

## 3.7 BACKFILLING

A. General

1. All excavations shall be backfilled to the original surface of the ground or to such other grades as may be shown, specified or directed.

2. The excavations shall be backfilled by the Contractor as follows:

a. Suitable excavated "earth" material from the site that was removed between a depth of 0 and 2 ft bgs and suitable "earth" excavated below a depth of 2 ft bgs, provided that it does not exhibit visible tar or non-aqueous phase liquid (NAPL) and contains less than 500 mg/kg total polynuclear aromatic hydrocarbons (PAHs), shall be placed as backfill deeper than 2 ft below the finished ground surface. The Contractor shall sample stockpiled soil appearing to be suitable on a frequency of 1 composite sample per 200 cy, or as otherwise directed by the Engineer, and analyze the soil for PAHs to determine if the soil is suitable for use as backfill on-site.

b. The Contractor shall import clean "Select Fill" from an Owner-approved off-site source for use as backfill, as shown or directed, from a depth of 2 ft to the final ground surface. Clean fill from off-site shall also be used deeper than 2 ft below the finished ground surface if a sufficient volume of suitable "earth" excavated from the site is not available for placement as described above.

c. Prior to placing clean "Select Fill" on top of excavated "earth" from the site used as backfill, a geotextile demarcation fabric shall be placed by the Contractor so to separate the materials as shown or directed.

d. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation. In the event the excavated materials are not suitable, Select Fill as specified or ordered by the Engineer shall be used for backfilling and the excess or unsuitable excavated material shall be disposed of off-site.

3. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Soil containing 500 mg/kg or more of total polynuclear aromatic hydrocarbons (PAHs), or soil exhibiting visible tar or NAPL, shall not be used for backfill and shall be disposed off-site as appropriate.

2. Stones, pieces of rock or pieces of pavement greater than 1 cubic foot in volume or greater than 1.5 feet in any single dimension shall not be used in any portion of the backfill.

3. All stones, pieces of rock or pavement shall be distributed through the backfill and alternated with earth backfill in such a manner that all interstices between them shall be filled with earth.

4. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.

   a. The compaction specified shall be the percent of maximum dry density.

   b. The compaction equipment shall be suitable for the material encountered.

2. Where required, to assure adequate compaction, in-place density test shall at the expense of the Contractor be made by an approved testing laboratory.

   a. The moisture-density relationship of the backfill material shall be determined by ASTM D1557.

      1) Compaction curves for the full range of materials used shall be developed.

   b. In-place density shall be determined by the methods of ASTM D1556 or ASTM D2922 and shall be expressed as a percentage of maximum dry density.

3. Where required, to obtain the optimum moisture content, the Contractor shall add, at his expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.

4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.

## 3.8 OTHER REQUIREMENTS

A. Drainage

1. All material deposited in roadway ditches or other water courses shall be removed immediately after backfilling is completed and the section, grades and contours of such ditches or water courses restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

B. Unfinished Work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways, sidewalks and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways and sidewalks shall have a temporary pavement.

C. Hauling Material on Streets

1. When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

D. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of his operations to such a degree that it will not endanger the safety and welfare of the general public.

2. Calcium chloride and petroleum products shall not to be used for dust control.

E. Odor Control

1. The Contractor shall implement provisions to control odor emanating from excavations and stockpiles of soil and material excavated from the Site. Primary measures shall be implemented to minimize generation of odor by minimizing, to extent practicable, exposed surface of waste material and contaminated soil. Secondary measures shall include use of products, approved by Engineer, to mask objectionable odors. The Engineer, in consultation with the NYSDEC and NYSDOH, shall be sole judge as to whether or not an odor is perceptible and objectionable requiring control measures. No additional payment shall be made to Contractor to control odors from the excavations or waste material stockpiles.

2. At a minimum, the Contractor shall provide two Rusmar PFU400/25 Pneumatic Foam Units, each with a dedicated operator for the duration of excavation and loading activities. One unit shall be operated at the excavation location and one shall be operated at the stockpile/material

loading location. A minimum of 16 drums of Rusmar AC-645 Long Duration foam shall be prior to the start of excavation. Additional drums of Rusmar AC-645 Long Duration foam shall be provided as necessary.

3. The following additional dust and odor control measures may be used, depending upon specific circumstances, field observations, and air monitoring results:

   a. Other odor suppression foams

   b. Bio-Solve

   c. Water Spray

   d. Piian odor control system, or equivalent

   e. Polyethylene sheeting (for covering excavation faces, material stockpiles, etc.)

F. Test Pits

1. For the purpose of obtaining detail locations of underground obstructions, the Contractor shall make excavations in advance of the work. Payment for the excavations ordered by the Engineer will be made under an appropriate item of the Contract and shall include sheeting, bracing, pumping, excavation and backfilling.

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SECTION 02223

EMBANKMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment required in the construction of earth embankments constructed to established lines and grades at the locations shown on the Contract Drawings and as directed by the Engineer.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02211 – Clearing and Grubbing

B. 02221 – Earthwork

C. 02241 – Off-Site Transportation and Disposal

D. 02503 – Restoration of Surfaces

E. 02981 – Topsoil and Seeding

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$) (600 kN-m/m$^3$)

b. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

c. D1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft$^3$) (2,700 kN-m/m$^3$)

d. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.4 SUBMITTALS

A. The following items shall be submitted:

1. Proposed testing laboratory

2. Source of off-site materials

3. Compaction curves for all materials to be used

4. Particle size distribution curves for all materials to be used

5. Certification from Owner of source testing in accordance with the Special Provisions.

6. Location of samples collected within borrow areas for laboratory testing.

7. Results of field tests.

8. All mining and borrow permits required by local, state and federal agencies.

1.5 TESTING

A. All testing, including field and laboratory services, shall be at the Contractor's expense without additional compensation, except where separate payment is specified.

PART 2 PRODUCTS

2.1 GENERAL

A. Embankment material shall be free from frost, stumps, trees, roots, sods, muck, marl, vegetable matter or other unsuitable material and shall be suitable for compaction as described in the following provisions. Where embankments are to be placed underwater only acceptable granular materials shall be used unless otherwise specified.

B. Embankment materials shall be obtained from acceptable soils on the site, or approved off-site sources.

PART 3 EXECUTION

3.1 PREPARATION OF SUBGRADE

A. The entire surface to be covered with embankment shall be grubbed and stripped of all grass, vegetation, topsoil, rubbish, or other unsuitable materials before any embankment material is placed.

1. Topsoil shall be stockpiled or placed as designated.

2. Other grubbed and stripped materials shall be removed as spoil.

B. Stripped or excavated surfaces on which embankments are to be placed shall be compacted to the required density of the embankment prior to any fill being placed.

3.2 PLACEMENT AND COMPACTION

A. Materials shall be placed in lifts not greater than 8 inches of thickness unless greater thicknesses are allowed by the Engineer upon demonstration by the Contractor that the materials and compaction efforts are adequate to obtain the required density.

B. Material shall be placed in a uniform lift and thoroughly compacted by compaction equipment suitable for the material encountered to obtain the required density prior to the placement of succeeding lift.

1. Each lift shall be tested for proper compaction before successive lifts are applied.

C. Stones shall not exceed 6 inches in greatest dimension and shall be well distributed throughout the soil mass. Stone shall be defined as rock material either in its natural or broken state.

D. Stones not well mixed with soil material shall not be used in earth embankments unless the stone material is sufficiently deteriorated or friable so as to be compactable to achieve minimum voids and required density.

E. If the required density is not obtained, compaction of the embankment shall continue until specified densities are obtained, before any additional embankment is placed. Improperly compacted embankment shall be removed.

F. Where required, the Contractor shall, at his expense, add sufficient water during the compaction effort to assure proper density. If, due to rain or other causes, the material exceeds the optimum moisture content for satisfactory compaction, it shall be allowed to dry, assisted by discing or harrowing, if necessary, before compaction or filling effort is resumed.

G. The Contractor shall be required to seal the working surface at the close of each day's operation and when practical prior to rainfall. Sealing shall be accomplished by rolling the surface with a smooth wheel steel roller.

H. Compaction or consolidation achieved by traveling trucks, machines and other equipment will not be accepted unless such procedures are approved by the Engineer and proper compaction density is achieved.

I. Hand tamping shall be required around buried utility lines or other subsurface features that could be damaged by mechanical compaction equipment.

J. Embankments shall be constructed to such elevations as to make allowance for any settlement that may occur. Prior to the construction of any structure, roadway or other ground feature and before final acceptance of the contract, the Contractor shall regrade the embankments to conform to the established lines and grades.

3.3 DENSITY CONTROL

A. Embankments shall be compacted to 95% of maximum dry density as determined by the density tests designated in ASTM D1557.

1. Compaction curves for the full range of soil materials to be used in the embankment shall be developed by an approved independent testing laboratory.

B. Field control samples shall be taken and tested by the testing laboratory as required to assure that adequate compaction of the embankment material is being achieved.

C. A minimum of one (1) in-place density test shall be made for every (10,000) square feet of compacted area per lift.

1. In-place density of soils shall be determined by the methods described in ASTM D1556 or ASTM D2922 and expressed as a percentage of the maximum dry density.

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# SECTION 02225

# STRUCTURAL EXCAVATION, BACKFILL AND COMPACTION

## PART 1 GENERAL

### 1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment as required to perform excavation and backfill activities for the construction of structures in accordance with the applicable provisions of the Section entitled "Earthwork" unless modified herein.

### 1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

B. 02223 – Embankment

C. 02225 – Structural Excavation, Backfill and Compaction

D. 02231 – Select Fill

E. 02503 – Restoration of Surfaces

F. 02981 – Topsoil and Seeding

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

### 3.1 LIMITS OF EXCAVATION

A. Excavations shall be made to the elevations or subgrades specified and shall be only of sufficient size to allow suitable room for the proper construction of structures and appurtenances, including allowances for sheeting, dewatering, and other similar work necessary for completion of the Contract.

B. Normal subgrade for structures shall be the underside of footing lines or mud mats, if installed.

C. In no case will undercutting excavation faces be permitted.

### 3.2 SUBSURFACE REINFORCEMENT

A. Where an unstable subgrade is encountered and subject to the approval of the Engineer, select fill may be used for subgrade reinforcement if satisfactory results

can be obtained thereby. Such material shall be applied in thin layers, each layer being entirely embedded in the subsoil by thorough tamping.

B. All excess material shall be removed to compensate for the displacement by the select fill and the finished elevation shall not be above the specified subgrade.

C. Where subgrade reinforcement is unsatisfactory, a concrete mud mat of sufficient thickness to withstand subsequent construction operations shall be installed below the specified elevation and the structural concrete deposited thereon.

3.3 SUBSURFACE

A. Subsurface for all concrete structures shall be undisturbed original earth or, mud mat on undisturbed original earth, or where excavation below subgrade is ordered, it shall be thoroughly compacted special backfill or concrete mudmat as specified or directed and shall be sufficiently stable to remain firm and intact during the preparation for the placing of concrete thereon.

3.4 REMOVAL OF WATER

A. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work or the proper placing of pipes, structures, or other work.

B. The removal of water shall be in accordance with the Section entitled "Earthwork".

3.5 BACKFILLING

A. Backfilling shall be with suitable excavated materials which can be compacted as specified. In the event the excavated materials are not suitable, special backfill as specified or ordered by the Engineer shall be used for backfilling.

B. Backfilling around structures shall not be commenced before the structure has developed sufficient strength to withstand the loads applied. No backfill material shall be allowed to fall directly on a structure, until at least 12 inches of material has been hand-placed and compacted nor shall any material be pushed directly against a structure in backfilling.

C. Backfill shall be deposited in horizontal layers and at no greater thickness than can be compacted to obtain the specified minimum densities.

3.6 COMPACTION

A. Where structures, driveways, sidewalks or other features are to be constructed on the backfilled area the entire backfill shall be compacted to obtain 95% maximum density. Other areas shall be compacted to obtain 90% maximum density.

B. The density shall be determined as set forth in the Section entitled "Earthwork".

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# SECTION 02229

# ROCK REMOVAL

## PART 1 GENERAL

### 1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment as required for the removal to the widths and depths shown on the Contract Drawings or as directed by the Engineer, including the loosening, removing, transporting, storing and disposal of all materials requiring blasting, barring, or wedging for removal from their original beds, and backfill of rock excavations with acceptable materials.

### 1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

B. 02241 – Off-Site Transportation and Disposal

### 1.3 SUBMITTALS

A. The following items shall be submitted:

1. Work plan describing means and methods for removing rock and permits and licenses (if any) required.

### 1.4 DEFINITIONS

A. Rock

1. All pieces of ledge or bedrock, boulders or masonry larger than one-half cubic yard in volume.

2. Any material requiring blasting, barring, or wedging for removal from its original bed.

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

### 3.1 BLASTING

A. General

1. No blasting shall be permitted.

B. Rock Clearance in Trenches

1. Ledge rock, boulders and large stones shall be removed from the sides and bottom of the trench to provide clearance for the specified steel sheet piling; but in no instance shall the clearance be less than 6 inches.

2. At the transition from an earth bottom to a rock bottom the minimum bottom clearance shall be 12 inches for a distance of not less than 5 feet.

3.2 EXCAVATION AND BACKFILL

A. Rock removal and backfilling shall be performed in accordance with the applicable provisions of the Section entitled "Earthwork".

B. The rock excavated which cannot be incorporated into the backfill material, as specified, shall be disposed of as spoil and shall be replaced with the quantity of acceptable material required for backfilling.

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# SECTION 02231

# SELECT FILL

## PART 1 GENERAL

### 1.1 SUMMARY

A. This Section includes select fill materials used in either embedment or special backfill, as specified or as directed by the Owner.

### 1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02503 – Restoration of Surfaces

### 1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D422 - Method for Particle-Size Analysis of Soil

### 1.4 SUBMITTALS

A. The following items shall be submitted:

1. The name and location of the source of the material.

2. Samples and test reports of the material in accordance with New York State Department of Environmental Conservation (NYSDEC) guidance document DER-10.

### 1.5 DEFINITIONS

A. Embedment or Lining

1. Any type granular material specified or directed placed below an imaginary line drawn one foot above the inside diameter of the pipe and within the trench limits.

B. Special Backfill

1. Pipelines

a. Any select fill material specified or directed placed above an imaginary line drawn one foot above the inside diameter of the pipe and within the trench limits.

2. Structures

a. Any select fill material specified or directed placed within the excavation limits, either in, under or adjacent to the structure.

C. Special Granular Material

1. Special granular material shall mean any of the granular materials listed below or other materials ordered by the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Type A

1. Crushed Gravel

a. Thoroughly washed crushed, durable, sharp angled fragments of gravel free from coatings. Crushed particles shall be a minimum of 85% by weight of the particles with at least two fractured faces. The total area of each fractional face shall exceed 25% of the maximum cross-sectional area of the particle.

b. Crushed gravel shall have the following gradation by weight:

| % Passing | Sieve |
|---|---|
| 100% | 1½-inch |
| 0-25% | ¾-inch |
| 0-5% | ½-inch |

B. Type B

1. Crushed Stone

a. Thoroughly washed clean, sound, tough, hard crushed limestone or approved equal free from coatings. Gradation for crushed stone shall be the same as specified for Type A material.

C. Type C

1. Crushed Stone

a. Thoroughly washed, clean, sound, tough, hard, crushed limestone or approved equal free from coatings. It shall have a gradation by weight of 100% passing a 1-inch square opening and 0 - 15% passing a ¼-inch square opening.

D. Type D

1. Washed Sand

a. Washed coarse sand having the following gradation by weight:

| % Passing | Sieve |
|---|---|
| 100 | 3/8 inch |
| 95 – 100 | No. 4 |
| 80 – 100 | No. 8 |
| 50-85 | No. 16 |
| 25 – 60 | No. 30 |
| 10 – 30 | No. 50 |
| 2 – 10 | No. 100 |

b. The D10 shall be equal to or greater than 0.65 mm

E. Type E

1. Run-of-Bank Gravel

a. Run-of-bank gravel or other acceptable granular material free from organic matter with a gradation by weight of 100% passing a 1½-inch square opening, 30 to 65% passing a ¼-inch square opening and not more than 10% passing a No. 200 mesh sieve as determined by washing through the sieve in accordance with ASTM D422.

F. Type F

1. Run-of-crusher Stone

a. Run-of-crusher hard durable limestone or approved equal having the following gradation by weight:

| % Passing | Sieve |
|---|---|
| 100 | 1½- inch |
| 95 – 100 | 1 |
| 65 – 80 | ½ |
| 40 – 60 | ¼ |
| 0 – 10 | #200 Sieve |

G. Type G

1. A mixture of Type E material and Portland cement mixed in a ratio of 15:1 and placed and compacted in a dry state.

H. Type H

1. Graded Aggregate

a. Use graded aggregate base material of uniform quality throughout, substantially free from vegetable matter, shale, lumps and clay balls, and having a Limerock Bearing Ratio value of not less than 100. Use material retained on the No. 10 [2.00 mm] sieve composed of aggregate meeting the following requirements:

Soundness Loss, Sodium, Sulfate: AASHTO T 104 .....15%
Percent Wear: AASHTO T 96 (Grading A)
Group 1 Aggregates ..... ..... ..... ..... ..... ..... .....45%
Group 2 Aggregates ..... ..... ..... ..... ..... ..... .....65%
Group 1: This group of aggregates is composed of limestone, marble, or dolomite.
Group 2: This group of aggregates is composed of granite, gneiss, or quartzite.
Use graded aggregate base material meeting the following gradation:

| % Passing | Sieve |
|---|---|
| 100 | 2-inch |
| 95 – 100 | 1 1/2 |
| 65 – 90 | 3/4 |
| 45 – 75 | 3/8 |
| 35 – 60 | #4 Sieve |
| 25 - 45 | #10 Sieve |
| 5 - 25 | #50 Sieve |
| 0 - 10 | #200 Sieve |

2.2 CHEMICAL ANALYSES OF FILL MATERIAL

A. Backfill material shall be sampled and analyzed in accordance with NYSDEC guidance document DER-10 prior to import to the site to demonstrate that the material is acceptable for use. Stone, gravel and recycled brick or concrete does not require chemical testing as long as these products contain less than 10% by weight material that would pass through a #80 sieve (DER-10, 5.4,e, 5) and the Engineer approves the material source.

PART 3 EXECUTION

3.1 INSTALLATION

A. Special backfill where specified or directed shall be placed in accordance with the backfilling provisions of the Section entitled "Earthwork".

3.2 DISPOSAL OF DISPLACED MATERIALS

A. Materials displaced through the use of Select Fill shall be wasted or disposed of by the Contractor and the cost of such disposal shall be included in the unit price bid for each of the materials.

3.3 SETTLEMENTS

A. Any settlements in the finished work shall be made good by the Contractor.

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SECTION 02241

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall properly transport and dispose of all items, including solid and liquid non-hazardous special wastes removed from the site or hazardous wastes (if applicable), to appropriate disposal facilities. This includes former manufactured gas plant (MGP) wastes as well as construction debris and other waste material (*e.g*. trees and brush removed from the areas of excavation) generated by the Contract work. The Contractor shall be responsible and will be held accountable for assuring that all sampling, analysis, transportation, and disposal requirements of the Treatment, Storage, and Disposal Facility (TSDF), Solid Waste Management Facility (SWMF), and Publicly Owned Treatment Works (POTW) are complied with as applicable, and that Federal, State, and local government requirements are complied with.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02141 - Construction Water Management

B. 02221 – Earthwork

1.3 SUBMITTALS

A. The following items shall be submitted:

1. Transportation Plan: The Contractor shall submit a Transportation Plan to the Engineer prior to the start of work for review. This shall include:

   a. Type and number of vehicles used;
   b. Travel routes and times; and
   c. Copies of transportation permits.

2. Disposal Facilities: The Contractor shall submit to the Engineer information regarding proposed facilities for disposal of each type of waste. All proposed facilities must be permitted and approved by National Grid to receive wastes from the Site. Information submitted shall include, but not be limited to:

   a. Name;
   b. Owner;
   c. Type of facility/permit;
   d. Contact person, phone number;
   e. Location;
   f. Hours of operation; and
   g. Copies of permits.

3. Description of the Contractor's proposed means to dewater and process the MGP-impacted soil to achieve no free liquid and a moisture content of 25% or less prior to shipment of the material off-site to a licensed or permitted disposal facility.

4. Copies of all laboratory test reports within one business day of receipt by the Contractor.

5. Copies of all waste characterization profile sheets and/or applications for disposal submitted to off-site disposal facilities to receive excavation spoils from the site.

6. Written copies of all acceptances/approvals provided by the disposal facilities receiving waste from the site including the name, title, and signature of a disposal facility official authorized to approve acceptance of the excavation spoils or structure remnants.

7. Certified weight tickets, provided not later than the following business day, documenting the quantity of excavation spoils or structure remnants removed from the site with each load, and indicating the location off-site (by name and address) at which each load was disposed, and including the name, title and signature of the disposal facility representative accepting the waste.

8. Copies of Bill of Lading shipping papers. If the material disposed is a hazardous waste, the Contractor shall also prepare and provide hazardous waste disposal manifests for signature by National Grid or an agent authorized by them, in accordance with Federal and State regulations.

## 1.4 PERMITS AND REGULATIONS

A. The Contractor shall comply with all Federal, State, and local regulations regarding transportation and disposal of non-hazardous special wastes, and hazardous wastes if applicable. These include, but are not limited to:

1. Trucks used for transportation of wastes shall be permitted for such use in accordance with 6 NYCRR Part 364 and other applicable regulations;

2. Vehicle operator possession of a commercial driver's license with necessary non-hazardous special waste materials endorsement or hazardous waste materials endorsement (if applicable);

3. Registration of vehicle as a special non-hazardous waste or hazardous waste carrier (as applicable);

4. Utilization of shipping papers and/or hazardous waste manifests;

5. Proper marking and placarding of vehicles;

6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures; and

7. Compliance with load height and weight regulations.

## PART 2 PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

A. All equipment supplied shall be in good working condition. Equipment and machinery delivered to the site, including haul trucks that have visible oil or hydraulic fluid leaks, will not be allowed on site until satisfactorily repaired. The Contractor is responsible for the cleanup of any oil or hydraulic fluid spills at the Contractor's expense.

B. The Contractor shall not allow soil to be tracked off site at any time during the project. Visible soil tracks on streets will not be allowed. The Contractor shall take sufficient precautions to prevent loose soils from adhering to tire treads, wheel wells, etc. Any loose soil spread shall be cleaned up.

C. Trucks used for transportation of material for off-site disposal shall be lined and water tight. The disposal vehicles shall be equipped with locking tailgates and solid covers (*e.g*. tightly woven fabric, no mesh covers) that shall be utilized during the transportation of wastes from the Site to the disposal facility. Trucks carrying waste material are not permitted to leave the Site without the waste being covered.

## PART 3 EXECUTION

### 3.1 DECONTAMINATION

A. Transport vehicles shall be decontaminated upon leaving the Exclusion Zone at the site and again at the disposal facility as required.

### 3.2 SOIL SAMPLING AND TESTING

A. The Contractor shall be responsible for collecting and analyzing samples of the excavation spoils that contain visible tar or NAPL as required by the disposal facility as a condition for waste acceptance. Minimally, the following analyses shall be performed at the frequency identified below:

1. Percent moisture and Paint Filter test: Testing of each truck load to be sent off-site. Material being transported off-site must have no free liquid (e.g. pass paint filter test). The Contractor shall provide measures to dewater the material to achieve the moisture content requirement without augmentation of soil not otherwise requiring disposal off-site or use of drying agents (e.g. cement kiln dust). Utilization of drying agents and/or on-site soil not otherwise requiring off-site disposal might be allowed only if specifically permitted by the Engineer.

2. Material (if any) designated by National Grid to be transported to the low temperature thermal destruction (LLTD) facility operated ESMI in Fort Edward, New York must also have a moisture content not greater than 25%.

3. RCRA toxicity characteristic leaching procedure (TCLP) testing in accordance with the requirements of the off-site disposal facility approved by National Grid, but not less frequent than 1 composite sample analyzed for each 500 tons.

4. Waste characterization sampling and analyses for total petroleum hydrocarbons (USEPA method 8015), volatile organic compounds (VOCs) (USEPA method 8260B), semi-volatile organic compounds (USEPA method 8270C), polychlorinated biphenyls (USEPA method 8082), metals (including As, Ba, Cd, Cr, Pb, Hg, Se, Ag, An, Be, Ni, Th, Va, Zn) (USEPA method 6010B), cyanide (USEPA method 9010), percent sulfur (USEPA method D129-64), and British Thermal Units (BTU) by ASTM D240-87. Frequency of sampling and analyses as follows:

   a. 1st composite sample for the first 150 tons
   b. 2nd composite sample for the first 300 tons
   c. 3rd composite sample for the first 750 tons
   d. 1 additional composite sample for every additional 750 tons

5. The Contractor shall be responsible for all cost associated with other sampling and analyses of wastes to be disposed of as may be required by the disposal facility for characterization and acceptance of the material.

B. The Contractor shall be instructed by the Engineer when it is necessary to collect and analyze samples for analyses of the excavation spoils that do not contain visible tar or NAPL, but which exhibits a sheen, odor, or staining. Excavation spoils that do not contain visible tar or NAPL, but which exhibits a sheen, odor, or staining will be sampled and analyzed by the Contractor for toxicity characteristic leaching procedure (TCLP) VOCs. The Construction Contractor will include provision in their bid price and schedule for the collection of samples, receipt of results, and for up to two business days after providing the data to the Resident Engineer for subsequent instruction from the Resident Engineer regarding whether or not the stockpiled soil can remain on-site to be used as backfill below a depth of 2 ft below ground surface (bgs) or must be disposed of off-site based on the analyses. If disposal off-site is necessary, the Contractor shall conduct the additional sampling and analyses as required by the off-site disposal facility permitted or licensed to accept the waste.

C. All samples collected for characterization shall be composite samples, each being made of 5 grab samples from various locations of the stockpile, representative of the material in the stockpile.

## 3.3 DISPOSAL

A. Excavation spoils shall be disposed of at the Oneida and Herkimer Counties Landfill in the Town of Ava, New York (Ava Landfill) or other off-site disposal facility approved by National Grid based on the characteristics of the waste and approvals received from the disposal facility.

B. Waste material that cannot be accepted at the Ava Landfill due to tar or NAPL shall be disposed of at the LTTD facility operated by ESMI in Fort Edward, New York for treatment, unless it exhibits greater than 3.5% sulfur or other hazardous waste (except benzene) exhibiting toxicity in accordance with DER-4 (TAGM-4061), or for other reason cannot be accepted by ESMI. Material containing an excess of 3.5% sulfur or hazardous waste (except benzene) must be disposed of at an appropriate hazardous waste facility.

3.4 TRANSPORTATION

A. Materials shall be transported only at the times and by the routes indicated in the approved Transportation Plan, unless permission is received by the Engineer to do otherwise. The Contractor shall observe the legal load limits.

B. Prior to shipment of wastes off the site, the Contractor shall confirm by written communication from the designated TSDF that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular waste on the Bill of Lading or waste manifest. Additionally, the Contractor shall confirm by written communication from the designated transporter(s) that they are licensed or permitted to deliver the waste to the designated TSDF or SWMF.

3.5 MANIFESTING

A. The Contractor shall complete all required manifest forms and Bill of Lading forms for the signature by National Grid or its authorized agent for proper transportation and disposal of materials off site. The Contractor shall be responsible and will be held accountable for assuring that all sampling, analysis, transportation, and disposal requirements of the TSDF, SWMF, POTW, Federal, State, and local governments are complied with and properly documented.

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SECTION 02270

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes erosion and sediment control performed to minimize erosion of soils and sediments into drainage channels, and lands adjacent to or affected by the Work, and to prevent stormwater run-on onto work areas and to prevent potentially contaminated stormwater run-off (including soils and sediment) from leaving the site without appropriate treatment.

B. Erosion and sediment control measures to be implemented shall be in accordance with this specification, and as may be required by the New York State Department of Environmental Conservation (NYSDEC). In the event of discrepancies between this Specification and the NYSDEC requirements, the NYSDEC requirements shall govern.

C. Erosion and sediment controls shall be installed and maintained at additional locations as ordered by the Engineer and without additional cost when the Engineer is of the opinion that additional measures may be required to provide adequate erosion and sediment control.

1.2 REFERENCES

A. Materials and installation shall be in accordance with the project stormwater pollution prevention plan (SWPPP) and the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. 40 CFR 122 U.S. Environmental Protection Agency (USEPA) Administered Permit Programs: The National Pollutant Discharge Elimination System

2. 40 CFR 123 State Program Requirements

3. 40 CFR 124 Procedures for Decision Making

4. NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-0-10-001.

5. NYSDEC Standards and Specifications for Erosion and Sediment Control. (NYSDEC 2005).

6. New York State Stormwater Management Design Manual (the design Manual) prepared by the Center for Watershed Protection for the NYSDEC (2010).

1.3 SPECIAL REQUIREMENTS

A. In addition to appropriate permit and Erosion and Sediment Control (ESC) Plan requirements, construction procedures shall include protection of the environment in accordance with all pertinent Federal, State and local regulations. Construction procedures that are prohibited in the undertaking of work associated with this project include, but are not limited to:

1. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

2. Pumping of silt-laden water from trenches or other excavations into any surface waters, or any stream corridors, or wetlands.

3. Damaging vegetation beyond the extent necessary for the work of this project.

4. Disposal of trees, brush, and other debris in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

5. Dumping of spoil material into any stream corridor, surface waters, or at any unspecified or unapproved locations.

6. Open burning of any debris.

B. Prior to initiating site disturbance, the Contractor shall install ESC facilities in accordance with the ESC Plan. In addition, the Contractor shall place silt fence along the downgradient perimeter of the work areas and spoil piles and as directed by the Engineer. The ESC facilities shall be maintained throughout construction until the site is stabilized pursuant to GP-0-10-001.

C. The Engineer shall have the authority to limit the surface area exposed by clearing, grubbing and excavation, and to direct the Contractor to implement additional erosion, run-off and run-on control measures as he deems necessary with no additional consideration for payment being made to the Contractor in this regard.

PART 2 PRODUCTS

Section not used

PART 3 EXECUTION

3.1 GENERAL

A. Clearing schedules shall be formulated to provide minimum practical exposure of soils. Local run-on/run-off control measures shall be implemented as conditions

warrant. The Contractor shall make every reasonable effort so as to not unduly disturb the ecological or environmental quality of the area.

3.2 EROSION AND SEDIMENT CONTROL

A. During the land disturbance life of this project, the following sequence shall be adhered to:

1. Install stabilized construction entrances at access and egress locations.

2. Clearing and grubbing for those areas necessary for installation of perimeter controls.

3. Construction of perimeter controls including, but not necessarily limited to the installation and maintenance of silt fencing along the entire downgradient perimeter beyond the outer limits of potential set-up and work areas.

4. Remaining clearing and grubbing.

5. Trenching and excavation, providing temporary stabilization/erosion/run-off/run-on controls as required.

6. Final grading and permanent stabilization.

7. Removal of ESC facilities.

B. Erosion and sediment control measures may include straw bale dikes, silt fences, earth dikes, stone check dams, stone outlet sediment traps, stabilized construction entrances, rip rap, seeding/sodding, properly anchored mulch, and/or other measures as required.

C. Erosion and sediment control measures shall be properly maintained and adequately functioning. Any existing measures that are damaged shall be immediately repaired.

D. Excavated material shall be protected from erosion by using appropriate devices or stabilization.

E. Trapped sediment shall be removed from the area of deposition and disposed of in accordance with the Section “Earthwork.”

F. As soon as possible after disturbance of a graded area, slope stabilization through the use of seeding, mulches (wood chips or straw anchored appropriately) or matting shall be provided.

G. Stormwater that has come into contact with potentially contaminated sources shall be treated in accordance with the Section "Construction Water Management."

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SECTION 02278

GEOTEXTILE FILTER FABRIC

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment and performing all operations required for testing, furnishing, hauling, and placing geotextile, complete as specified herein and as shown on the Contract Drawings or specified by the Engineer.

1.2 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. ASTM D3786 Test Methods for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabric-Diaphragm Bursting Strength Tester Method

b. ASTM D4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

c. ASTM D4491 Test Methods for Water Permeability of Geotextiles by Permittivity

d. ASTM D4533 Test Method for Trapezoid Tearing Strength of Geotextiles

e. ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles

f. ASTM D4751 Test Method for Determining the Apparent Opening Size of a Geotextile

g. ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

h. ASTM D5101 Test Method for Measuring Soil-Geotextile System Clogging Potential (By the Gradient Ratio)

1.3 SUBMITTALS

A. The following items shall be submitted:

1. Manufacturer's certification that all materials furnished comply with the applicable requirements of the referenced standards and this specification.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The following manufacturers are named to establish a standard of quality necessary for the project:

1. TC Mirafi 1120N
2. Or approved equal

2.2 GEOTEXTILE FILTER FABRIC

A. The geotextile filter fabric shall consist of a long-chain geosynthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, amids, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and heat exposure. The geotextile shall also be mildew and rot resistant, insect and rodent resistant, and inert to chemicals and hydrocarbons.

B. The geotextile filter fabric shall be a nonwoven, needle-punched geotextile.

C. The geotextile filter fabric shall conform to the following minimum average roll physical strength requirements:

| Property | Standard | Criteria |
|---|---|---|
| Mass Per Unit | ASTM D5261 | Minimum 12.0 oz/yd$^2$ |
| Permittivity | ASTM D4491 | Minimum 0.8 sec$^{-1}$ |
| Grab Tensile Strength | ASTM D4632 | Minimum 300 lbs |
| Grab Tensile Elongation | ASTM D4632 | Minimum 50% |
| Trapezoid Tear Strength | ASTM D4533 | Minimum 115 lbs |
| Puncture Strength | ASTM D4833 | Minimum 175 lbs |
| Mullen Burst Strength | ASTM D3786 | Minimum 585 psi |
| UV Resistance | ASTM D4355 (after 500 hours) | 70% strength retained |
| Apparent Opening Size | ASTM D4751 | Maximum No. 100 U.S. Sieve |

D. During all periods of shipment and storage, the geotextile shall be protected from adverse weather, heavy winds or precipitation, direct sunlight, ultraviolet light, temperatures greater than 140°F, mud, dirt, dust, debris, and vandals. To the extent possible, the geotextile shall be maintained wrapped in a heavy duty protective covering. In the event of damage, the Contractor shall immediately make all repair and replacements at no additional cost to the Owner.

E. All geotextile testing services as specified herein and necessary for the Contractor to obtain an approved geotextile material and thread shall be provided by the Contractor. All testing including laboratory and field services required during installation of the geotextile shall be provided by the Contractor.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to installation of the geotextile filter fabric, the surface material on which the filter fabric is to be installed will be free of organic matter, irregularities, protrusions, and any abrupt changes in grade that could damage the filter fabric. The surface will be maintained in a smooth and uniform condition during installation of the filter fabric. The surface on which the geotextile is to be placed shall be inspected and accepted by the Engineer prior to placement of the geotextile filter fabric.

B. The geotextile shall be placed in manner and at the locations shown on the Contract Drawings. At the time of the installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

C. The geotextile shall be placed with the long dimension perpendicular to the center line of trench, unless otherwise approved by the Engineer, and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The geotextile shall be placed to provide minimum overlaps of 1.5 feet.

D. The geotextile shall be protected at all times during construction from damage by surface runoff and construction activities, and any geotextile so damaged shall be removed and replaced with undamaged geotextile. Any damage to the geotextile during its installation or during placement of soil layers or other activities shall be replaced by the Contractor at the Contractor's expense.

E. The Work shall be scheduled so that the covering of the geotextile (i.e. backfilling) with the specified material is accomplished within 5 days after placement of the geotextile. Failure to comply shall require replacement of geotextile.

F. The geotextile shall be protected from damage due to the placement of materials by limiting the height of drop of the material to less than 1 foot unless otherwise accepted by Engineer.

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# SECTION 02400

# STEEL SHEET PILING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. The work covered by this section consists of furnishing all labor, equipment, supplies and materials for the installation and removal of temporary steel sheet piling. The work shall also include all anchors, walers, struts, and miscellaneous hardware associated with the steel sheet piling.

B. Steel sheet piling shall be installed, as necessary, to facilitate the excavation activities and to maintain stability of the existing foundation systems.

C. The Owner or the Engineer makes no warranty, expressed or implied, of the Site and subsurface conditions or the potential impact of subsurface conditions on the Contractor's performance or schedule.

### 1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

B. 02225 – Structural Excavation, Backfill and Compaction

### 1.3 REFERENCES

A. All work shall be performed in compliance with the Specifications unless otherwise approved in writing by the Engineer.

B. Tests performed on the specified materials shall conform to the American Society for Testing and Materials (ASTM) and the American Welding Society (AWS) latest edition standards referenced below:

1. American Society for Testing and Materials (ASTM) Standards (latest revisions):

   A 328, Steel Sheet Piling.

2. American Welding Society (AWS)

   D 1.1, Structural Welding Code.

### 1.4 SUBMITTALS

A. The following items shall be submitted:

1. The Contractor shall prepare and submit as part of the Construction Plan, a section to discuss the steel sheet piling alignment, installation and removal as required hereinafter. Steel sheet piling and shoring/bracing system calculations

and design shall be signed and sealed by a Professional Engineer licensed to practice in the State of New York. The Contractor shall submit list and descriptions of sheet piling material, alignment, depth, driving and removal equipment and material, shop drawings, sheet piling driving records, and other required submittals to the Engineer for review and acceptance. Submittals and associated work not meeting the requirements of the Contract Documents shall be rejected.

Equipment/Material List and Descriptions - Complete list and descriptions of sheet pile driving and removal equipment (e.g., hammers, extractors); control methods to prevent agitation of sediments during driving and removal; interlock sealant, protection caps and other installation appurtenances shall be submitted for acceptance prior to delivery to site.

Shop Drawings - Shop drawings for sheet piling including fabricated sections shall show complete dimensions and details of piling and the driving sequence, location and depth of piling. Shop drawings shall include details and dimensions of templates and other temporary guide structures for installing the piling. Shop drawings shall provide details of the method of handling piling to prevent deflection, distortion or damage to piling interlocks.

Material Test Certificates - Material test certificates shall be submitted for each shipment and identified with specific lots prior to installing piling. Identification data shall include piling type, dimensions, chemical composition, mechanical properties, section properties, heat number and mill identification mark.

Records - Records of the sheet piling driving operations shall be submitted to National Grid's On-site Representative for review and acceptance after driving is completed as detailed in this specification. These records shall provide a system of identification which shows the disposition of accepted piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations.

Tieback and/or shoring/bracing system - Components as shown on the Contract Drawings shall be submitted to the Engineer for review and approval prior to installation.

Vibration Minimization and Monitoring Plan - The plan shall include all methods and sequencing of all operations that may induce vibrations to adjacent utilities and structures. The Vibration Minimization and Monitoring Plan shall include, but not be limited to, the installation of the steel sheet piling as specified, the sequencing installation of sheet piling and or shoring that may cause vibrations, the type of equipment to be used for the installation of the sheet piling and the sequencing of the installation of the sheet piling. The plan shall also include methods, plans, and drawings showing the type and location of each vibration monitoring device, and requirements for vibration action limits (peak particle velocity greater than 0.5 inches/sec). The construction activities associated with any activity that may induce vibrations to the soils shall not be initiated until the Vibration Minimization and Monitoring Plan is reviewed and accepted by the Owner and the Engineer.

At a minimum, vibration monitoring devices shall be placed at the site perimeter between any existing structures and the location of the sheet piling installation. Particular attention shall be paid to any vibration sensitive materials such as masonry. The Vibration Minimization and Monitoring plan shall be developed by a Professional Engineer licensed to practice in the state of New York.

1.5 QUALIFICATIONS

A. The Contractor shall submit with its bid evidence of experience and competence in steel sheet pile wall construction with its bid as described herein. The evidence shall demonstrate that the Contractor has a minimum of 10 years experience in steel sheet pile wall construction. The evidence shall also demonstrate that the Contractor has experience and qualified personnel to complete the work using sufficient and appropriate equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Temporary steel sheet piling shall be supplied in lengths suitable for installation based on the depths of excavation indicated on the Contract Drawings. This information shall be submitted to the Engineer for review and approval prior to mobilization of the sheet piling.

B. The interlocks of the steel sheet piling shall be free-sliding and maintain continuous interlocking when installed.

C. Contractor shall provide sealant to seal sheet pile wall interlocks. The material to be applied prior to installing the sheeting shall be "Adeka Ultra Seal A-30" or approved equal.

2.2 DELIVERY, STORAGE AND HANDLING

A. Materials delivered to the Site shall be in an undamaged condition. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. The sheet piling shall be managed to allow the proper application of the interlock sealant prior to installation.

PART 3 - EXECUTION

3.1 SHEET PILE INSTALLATION

A. The Contractor shall handle the sheet pile in a manner that will not cause excessive bending stresses. The Contractor shall not damage the sheet piles in either handling or installing operations. Any damaged sheet piles will be rejected by the Engineer and the sheet piles shall be either repaired or replaced. Any repairs shall be inspected and accepted by the Engineer prior to installation.

B. Driving Hammers, proposed by the Contractor and accepted by the Engineer, may be steam, air, or diesel drop, single-acting, double-acting, differential-acting, or vibratory

type. The Contractor shall select a driving method which minimizes the vibration of the surrounding foundations and structures. The driving energy of the hammers shall be as recommended by the manufacturer for the piling weight and subsurface materials to be encountered. The method and equipment selected shall install the piling to the required design depths to minimize damage to each end of piling and adjacent interlocks. Suitable procedures shall be employed to prevent damage to the pile tops and interlocks.

C. Sheet piles shall be carefully located and shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot at length and as true to lines as possible. Deviation in horizontal alignment shall not exceed 10 degrees at each joint. Temporary wales, templates, or guide structures shall be provided to ensure that the pilings are placed and driven to the correct alignment. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous surface throughout the length or run of piling wall.

D. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. Piles damaged or driven outside the tolerances specified shall be replaced at no additional cost to National Grid. Piling damaged during driving, driven out of interlock, ruptured in the interlock, or otherwise damaged during installation shall be immediately removed and replaced. The damaged pile shall be spray painted with the letter "X" within three feet of both ends. Pilings shall be driven without the aid of a water jet. Adequate precautions shall be taken to ensure that pilings are driven plumb.

E. Should obstructions restrict driving a piling to the specified penetration the Contractor shall attempt to drive through the obstruction. If the Contractor demonstrates that it is impractical to drive through the obstruction, the Contractor shall make changes in the alignment of the piling structure and submit the same to the Engineer for review and acceptance. The use of pre-trenching and driving shoes may also be employed by the Contractor if deemed necessary and as submitted for review to the Engineer.

## 3.2 CUTTING AND SPLICING

A. The top of pile at elevation of cut-off shall allow for the safe and proper execution of the excavation activities. Where required, to meet the top of wall elevation, the sheet piling shall be cut to remove excess material. No reimbursement for scrap metal or any excess material is allowed to the Contractor.

Sheet piles damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed by the Engineer. Pilings adjoining spliced pilings shall be full length unless otherwise accepted by the Engineer. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips, or camber at the abutting interlocks. The splices shall be made using a full penetration weld.

Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. The Contractor shall not cut any holes in pilings. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks.

## 3.3 INSPECTION OF DRIVEN PILING

The Contractor shall engage the sheet pile designer or his representative to be on site during the entire steel sheet piling installation, and to inspect the interlocks of the portion of driven pilings that extend above ground. Pilings found to be out of interlock shall be removed and replaced.

## 3.4 SHEET PILING REMOVAL

Removal of sheet piling will be at the direction of the Engineer. Sheet piling shall be removed using proper equipment during/after backfilling activity in that excavation area. Completion of removal of sheet piles shall be performed until accepted by the Engineer. Contractor is responsible for decontamination, transportation and proper disposal of removed sheet piling. Decontaminated sheet piles shall be inspected by the Engineer and approved for off-site transport. If decontaminated sheet piles are unacceptable to the Engineer, Contractor shall decontaminate again at no cost to National Grid.

## 3.5 SHEET PILE INSTALLATION RECORDS

The Contractor shall document the following information and provide this information to the Engineer in report format upon completion of the sheet pile installation. Information shall include:

1. Pile identification number;

2. Date and time of driving;

3. Length of sheet pile in the ground when driving is complete;

4. Detailed remarks concerning alignment, obstructions, etc.;

5. Plumbness records of each sheet pile installed; and

6. Driving logs showing to time to install each foot of each sheet pile.

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SECTION 02503

RESTORATION OF SURFACES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes restoration and maintenance of all types of surfaces, sidewalks, curbs, gutters, culverts and other features disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature at least equal to the condition of each before the work began.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02231 – Select Fill
E. 02981 – Topsoil and Seeding

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified:

1. American Society for Testing and Materials (ASTM)

a. D1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft$^3$) (2,700 kN-m/m$^3$)

1.4 SUBMITTALS

A. The following items shall be submitted:

1. A schedule of restoration operations. After an accepted schedule has been agreed upon it shall be adhered to unless otherwise revised with the approval of the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. In general, permanent restoration of paved surfaces will not be permitted until one month's time has elapsed after excavations have been completely backfilled as specified.

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

3.2 TEMPORARY PAVEMENT

A. Immediately upon completion of refilling of the excavation, the Contractor shall place a temporary pavement over all disturbed areas of streets, driveways, sidewalks, and other traveled places where the original surface has been disturbed as a result of his operations.

B. Unless otherwise specified or directed, the temporary pavement shall consist of compacted run-of-crusher limestone to such a depth as required to withstand the traffic to which it will be subjected.

C. Where concrete pavements are removed, the temporary pavement shall be surfaced with "cold patch." The surface of the temporary pavement shall conform to the slope and grade of the area being restored.

D. For dust prevention, the Contractor shall treat all surfaces, not covered with cold patch, as frequently as may be required.

E. The temporary pavement shall be maintained by the Contractor in a safe and satisfactory condition until such time as the permanent paving is completed. The Contractor shall immediately remove and restore all pavement as shall become unsatisfactory.

3.3 PERMANENT PAVEMENT REPLACEMENT

A. The permanent and final repaving of all streets, driveways and similar surfaces where pavement has been removed, disturbed, settled or damaged by or as a result of performance of the Contract shall be repaired and replaced by the Contractor, by a new and similar pavement, as specified elsewhere or as directed by the Engineer.

1. The top surface shall conform with the grade of existing adjacent pavement and the entire replacement shall meet the current specifications of the local community for the particular types of pavement.

2. Where the local community has no specification for the type of pavement, the work shall be done in conformity with the State Department of Transportation Standard which conforms closest to the type of surfacing being replaced, as determined by the Engineer.

3.4 PREPARATION FOR PERMANENT PAVEMENT

A. When scheduled and within the time specified, the temporary pavement shall be removed and a base prepared, to the same thickness as the base prior to the work, to receive the permanent pavement.

1. The base shall be brought to the required grade and cross-section and thoroughly compacted before placing the permanent pavement.

2. Any base material that has become unstable for any reason shall be removed and replaced with compacted base materials.

B. Prior to placing the permanent pavement, all service boxes, manhole frames and covers and similar structures within the area shall be adjusted to the established grade and cross-section.

C. The edges of existing asphalt pavement shall be cut a minimum of 1 foot beyond the excavation or disturbed base, whichever is greater.

1. All cuts shall be parallel or perpendicular to the centerline of the street.

3.5 ASPHALT PAVEMENT

A. The permanent asphalt pavement replacement for streets, driveways and parking area surfaces shall be replaced with bituminous materials of the same depth and kind as the existing unless specified elsewhere or as directed by the Engineer.

B. Prior to placing of any bituminous pavement, a sealer shall be applied to the edges of the existing pavement and other features.

C. The furnishing, handling and compaction of all bituminous materials shall be in accordance with the State Department of Transportation Standards.

3.6 CONCRETE PAVEMENT AND PAVEMENT BASE

A. Concrete pavements and concrete bases for asphalt, brick or other pavement surfaces shall be replaced with Class “B” Concrete, air-entrained.

B. Paving slabs or concrete bases shall be constructed to extend 1 foot beyond each side of the trench and be supported on undisturbed soil. Where such extension of the pavement will leave less than 2 feet of original pavement slab or base, the repair of the pavement slab or base shall be extended to replace the slab to the original edge of the pavement or base unless otherwise indicated on the Contract Drawings.

C. Where the edge of the pavement slab or concrete base slab falls within the excavation, the excavation shall be backfilled with Special Backfill compacted to 95% maximum dry density as determined by ASTM D 1557 up to the base of the concrete.

D. The new concrete shall be of the same thickness as the slab being replaced and shall contain reinforcement equal to the old pavement.

1. New concrete shall be placed and cured in accordance with the applicable provisions of the State Department of Transportation Standards.

3.7 STONE OR GRAVEL PAVEMENT

A. All pavement and other areas surfaced with stone or gravel shall be replaced with material to match the existing surface unless otherwise specified.

1. The depth of the stone or gravel shall be at least equal to the existing.

2. After compaction the surface shall conform to the slope and grade of the area being replaced.

3.8 CONCRETE WALKS, CURBS AND GUTTER REPLACEMENT

A. Concrete walks, curbs and gutters removed or damaged in connection with or as a result of the construction operations shall be replaced with new construction.

1. The minimum replacement will be a flag or block of sidewalk and 5 feet of curb or gutter.

B. Walks shall be constructed of Class "B" concrete, air-entrained with stone aggregate on a 4-inch base of compacted gravel or stone.

1. The walk shall be not less than 4 inches in thickness or the thickness of the replaced walk where greater than 4 inches, shall have construction joints spaced not more than 25 feet apart, shall have expansion joints spaced not more than 50 feet apart, and shall be sloped at right angles to the longitudinal centerline approximately 1/8 inch per foot of width.

C. 2-inch expansion joint material shall be placed around all objects within the sidewalk area as well as objects to which the new concrete will abut, such as valve boxes, manhole frames, curbs, buildings and others.

D. Walks shall be hand-floated and broom-finished, edged and grooved at construction joints and at intermediate intervals matching those intervals of the walk being replaced.

1. The intermediate grooves shall be scored a minimum of 1/4 of the depth of the walk.

2. The lengths of blocks formed by the grooving tool, and distances between construction and expansion joints shall be uniform throughout the length of the walk in any one location.

E. The minimum length of curb or gutter to be left in place or replaced shall be 5 feet. Where a full section is not being replaced, the existing curb or gutter shall be sawcut to provide a true edge.

1. The restored curb or gutter shall be the same shape, thickness and finish as being replaced and shall be built of the same concrete and have construction and expansion joints as stated above for sidewalks.

F. All concrete shall be placed and cured as specified in the Section for concrete pavement.

3.9 LAWNS AND IMPROVED AREAS

A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.

B. The furnishing and placing of topsoil, seed and mulch shall be in accordance with the Section entitled "Topsoil and Seeding."

C. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

D. Any washout or damage that occurs shall be regraded and reseeded until a good sod is established.

E. The Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering and mowing, in good condition.

3.10 OTHER TYPES OF RESTORATION

A. Fence or gates damaged or destroyed as a result of the construction operations shall be replaced in like material and type.

B. Culverts destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location and grade. When there is minor damage to a culvert and with the consent of the Engineer, a repair may be undertaken, if satisfactory results can be obtained.

3.11 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

* * * * *

SECTION 02830

CHAIN LINK FENCE

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes fence framework, fabric, and gates as shown on the Contract Drawings, complete with accessories.

1.2 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1 American Society for Testing and Materials (ASTM)

a. A90 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles

b. A121 Specification for Zinc-Coated (Galvanized) Steel Barbed Wire

c. A392 Specification for Zinc-Coated Steel Chain-Link Fence Fabric

d. A428 Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles

e. A491 Specification for Aluminum-Coated Steel Chain-Link Fence Fabric

f. A585 Specification for Aluminum-Coated Steel Barbed Wire

g. A817 Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric

h. A824 Specification for Metallic-Coated Steel Marcelled Tension Wire for Use with Chain-Link Fence

i. A1011 Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High Strength Low-Alloy and High Strength Low-Alloy with Improved Formability

j. B117 Method of Salt Spray (Fog) Testing

k. C94 Ready-Mixed Concrete

l. F567 Standard Practice for Installation of Chain-Link Fence

m. F626 Specification for Fence Fittings

n. F1043 Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework

o. F1083 Standard Specification for Pipe, Steel and Hot Dipped Zinc Coated, (Galvanized) Welded, for Fence Structures

1.3 SUBMITTALS

A. The following items shall be submitted:

1. Manufacturer's certification that all materials furnished are in compliance with the applicable requirements of the referenced standards and this specification.

B. Samples of any material shall be submitted at the Engineer's request.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The following manufacturers are named to establish a standard of quality necessary for the Project.

1. Allied Tube & Conduit Corp.
2. Anchor Fence, Inc.
3. Page Aluminized Steel Corp.
4. Or equal

2.2 GENERAL

A. Framework: Type I

1. Type I - Schedule 40 steel pipe with 1.8 ounces of zinc coating per square foot of surface area conforming to Standard Specification ASTM F1083; or

2. Pipe shall be straight, true to section and conform to the following weights:

| Pipe Size Outside Diameter | Type I Weight Lbs./Ft. | Type II Weight Lbs./Ft. |
|---|---|---|
| 1 5/8" | 2.27 | 1.84 |
| 2" | 2.72 | 2.28 |
| 2-1/2" | 3.65 | 3.12 |
| 3" | 5.79 | 4.64 |
| 3-1/2" | 7.58 | 5.71 |
| 4" | 9.11 | 6.56 |

B. Fabric: Zinc-Coated or Aluminum-Coated Steel.

1. Zinc-coated fabric shall be galvanized after weaving with a minimum 2.0 ounces of zinc per square foot of surface area and conform to ASTM A 392, Class 2.

C. Fittings:

1. Pressed steel or cast iron, galvanized with a minimum of 1.2 ounces of zinc per square foot of surface area, or cast aluminum alloy, all conforming to ASTM F 626.

2.3 CONCRETE MIX

A. ASTM C 94 Portland Cement concrete with maximum 3/4" aggregate having a minimum compressive strength of 4,000 PSI at 28 days.

2.4 MATERIALS AND CONSTRUCTION

A. Fence Posts

1. Fence posts shall be sized as follows:

| Fabric Height | Line Post O.D. Type I | Terminal Post O.D. Type I |
|---|---|---|
| Under 6' | 2" | 3" |
| 6' to 9' | 2-1/2" | 3" |
| 9' to 12' | 3" | 4" |

B. Gate Posts

1. Gate posts shall be sized as follows:

| Single Gate Width | Double Gate Width | Post O.D. Type I |
|---|---|---|
| Up to 6' | Up to 12" | 3" |
| 7' to 12' | 13' to 25' | 4" |
| 13' to 18' | 25' to 36' | 6 5/8" |

C. Rails and Braces

1. Rails and braces shall be 1 5/8" O.D., Type I.

D. Fabric

1. Fabric shall be galvanized or aluminum-coated steel wire, 9 gage, woven in a 2-inch diamond mesh with top selvage twisted and barbed and bottom selvage knuckled. Fence heights up to 12 feet shall be one-piece widths.

E. Gates

1. Gates shall have frame assembly of 2-inches O.D., Type I or Type II pipe with welded joints. Weld areas repaired with zinc-rich coating applied per manufacturer's directions. Fabric shall match fence. Gate accessories, hinges, latches, center stops, keepers and necessary hardware shall be of quality required for industrial and commercial application. Latches shall permit padlocking of gate. Barbed wire shall be installed at top of gates.

F. Fittings

1. Post caps shall be pressed steel, cast iron or cast aluminum alloy designed to fit snugly over posts to exclude moisture. Supply cone type caps for terminal posts and loop type for line posts.

2. Rail and brace ends shall be pressed steel, cast iron or cast aluminum alloy, cup-shaped to receive rail and brace ends.

3. Top rail sleeves shall be tubular steel, 0.051 thickness by 7 inches long, expansion type.

4. Tension bars shall be steel strip, 5/8 inch wide by 3/16 inch thick.

5. Tension bands shall be pressed steel, 14 gage thickness by 3/4 inch wide.

6. Brace bands shall be pressed steel, 12 gage thickness by 3/4 inch wide.

7. Truss rods shall be steel rod, 3/8 inch diameter merchant quality with turnbuckle.

8. Barbed wire arms shall be pressed steel, cast iron or cast aluminum alloy fitted with clips or slots for attaching three strands of barbed wire. Arms shall be set outward on a 45 degree angle and be capable of supporting a 250 pound load at outer barbed wire connecting point without causing permanent deflection.

G. Tension Wire

1. Tension wire shall be marcelled 7 gage steel wire with minimum coating of 0.80 ounces of zinc or 0.40 ounces of aluminum per square foot of wire surface and conforming to ASTM A 824.

H. Barbed Wire

1. Barbed wire shall be commercial quality steel, 12 1/2 gage, two strand twisted line wire with 4 point barbs at 5-inch spacing. Coating shall consist of a minimum of 0.80 ounces of zinc per square foot of wire surface conforming to ASTM A 121 or a minimum of 0.30 ounces of aluminum per square foot of wire surface conforming of ASTM A 585.

I. Tie Wires

1. Tie wires shall be aluminum 9 gage, alloy 1100-H4, A58 self locking fabric bands or equal.

J. Hog Rings

1. Hog rings shall be steel wire, 11 gage with a minimum zinc coating of 0.80 ounces per square foot of wire surface.

PART 3 EXECUTION

3.1 INSTALLATION

A. Fence installation shall conform to requirements of ASTM F 567.

B. Provide fence heights as shown on Contract Drawings.

C. Space line posts at intervals not exceeding ten feet.

D. Set terminal, gate and line posts plumb in concrete footings as shown on Contract Drawings. Top of footing shall be 2 inches above grade and sloped to direct water away from posts.

E. Brace gate and terminal posts back to adjacent line posts with horizontal brace rails and diagonal truss rods.

F. Install top rail through line post loop caps connecting sections with sleeves to form a continuous rail between terminal posts. Fasten top rail to terminal posts.

G. Stretch bottom tension wire between terminal posts 6 inches above grade and fasten to outside of line posts with tie wires.

H. Pull fabric taut to provide a smooth uniform appearance, free from sag, with bottom selvage 2-inches above grade. Fasten to terminal posts with tension bars threaded through mesh and secured with tension bands at maximum 15-inch intervals. Tie to line posts and top rails with tie wires spaced at maximum 12 inches on posts and 24 inches on rails. Attach to bottom tension wire with hog rings at maximum 24-inch intervals.

I. Anchor barbed wire to terminal extension arms, pull taut to remove all sag and firmly install in slots of line post extension arms.

J. Install gates plumb, level and secure for full opening without interference. Anchor center stops and keepers in concrete. Adjust and lubricate hardware for smooth operation.

K. Install nuts for fittings, bands and hardware bolts on inside of fence. Peen ends of bolts or score threads to prevent removal.

* * * * *

# SECTION 02981

# TOPSOIL AND SEEDING

## PART 1 GENERAL

### 1.1 SUMMARY

A. This Section includes topsoil, fertilizer, seed, mulch anchorage, and associated work to be placed in the unpaved areas of excavation. These requirements also apply to other disturbed areas.

### 1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02503- Restoration of Surfaces

### 1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society of Testing and Materials (ASTM)

a. ASTM D422 Method for Particle-Size Analysis of Soils

b. ASTM D2974 Test Method for Moisture, Ash, and Organic Matter of Peat and other Organic Materials

c. ASTM D4972 Standard Test Method for pH of Soils

d. ASTM D5268 Specification for Topsoil Used for Landscaping Purposes

### 1.4 SUBMITTALS

A. The following items shall be submitted:

1. Documentation giving location of properties from which the topsoil will be obtained, names and addresses of the owners, and depth to be stripped.

2. Documentation giving the seed vendor's certified statement for the grass seed mixture required, stating common name, scientific name, percentage by weight, and percentages of purity and germination.

3. Documentation giving data concerning hydroseeding equipment (if used), including all material application rates.

4. Documentation regarding test results for particle size, acidity, fertility, and texture performed on representative samples of soil.

5. Each bag of fertilizer shall bear the manufacturer's guaranteed statement of analysis.

PART 2 PRODUCTS

2.1 TOPSOIL

A. The topsoil shall be unfrozen, natural, fertile, friable, clayey loam soil characteristic of productive soils in the vicinity and shall comply with ASTM D5268. No admixtures of subsoil shall be allowed. Topsoil must be uniform in composition and texture, clean and free from clay lumps, stones, weeds, sticks, brush, stumps, roots, toxic substances, and debris or similar substances 2-inches or more in greatest dimension.

B. Prior to and during installation of the topsoil layer, material from the borrow source shall be tested in accordance with the following standards and frequencies:

| Parameter | Standard | Minimum Frequency | Criteria |
|---|---|---|---|
| Topsoil Particle Size | ASTM D422 | Once per 1500 cy | Monitoring consistency of borrow source |
| Topsoil pH | ASTM 4972 | Once per 1500 cy | pH in the range of 5.5 and 7.6 |
| Topsoil Organic Content | ASTM 2974 | Once per 1500 cy | Not less than 5% nor more than 20% |

2.2 GRASS SEED

A. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix.

B. Seed Mixture: Pounds Per Acre

| Common Name | % by Weight | % Purity | % Germination |
|---|---|---|---|
| Timothy | 30 | 90 | 90 |
| Clover | 20 | 90 | 90 |
| Perennial Ryegrass | 40 | 90 | 90 |
| Annual Ryegrass | 10 | 90 | 90 |

2.3 FERTILIZER

A. Fertilizer shall be a standard quality commercial carrier of available plant food elements. A complete prepared and packaged material containing a minimum of 10 percent nitrogen, 10 percent phosphoric acid and 10 percent potash.

2.4 MULCH

A. Mulch shall be unrotted stalks of oats, wheat, rye or other approved crops which are free from noxious weeks, salt, mold, or other objectionable material.

B. Other sources of mulch may be utilized if approved by the Engineer.

PART 3 EXECUTION

3.1 INSTALLATION

A. The areas of excavation on site in unpaved areas shall be graded to a depth of not less than 4 inches below the proposed finished surface. If the depth of topsoil existing prior to construction was greater than 4 inches, the topsoil shall be replaced not less than the greater depth.

1. All debris and inorganic material shall be removed and the surface loosened for a depth of 2 inches prior to the placing of the topsoil.

2. The topsoil shall not be placed until the subgrade is in suitable condition and shall be free of excessive moisture and frost.

3. All topsoil shall be free from stones, roots, sticks and other foreign substances and shall not be placed in a frozen or muddy condition.

4. The finished surface shall conform to the lines and grades of the area before disturbed or as shown on the Contract Drawings. Any irregularities shall be corrected before the placement of fertilizer and seed.

B. The fertilizer shall be applied uniformly at the rate of 20 pounds per 1000 square feet.

1. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disc or other suitable method traveling across the slope if possible.

C. When the topsoil surface has been fine graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 10 pounds per 1000 square feet.

1. The seed shall be raked lightly into the surface and rolled with a light hand lawn roller.

2. Seeding and mulching shall not be done during windy weather.

D. The mulch shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Excessive amounts or bunching of mulch will not be permitted.

1. Mulch shall be anchored by an acceptable method.

2. Unless otherwise specified, mulch shall be left in place and allowed to disintegrate.

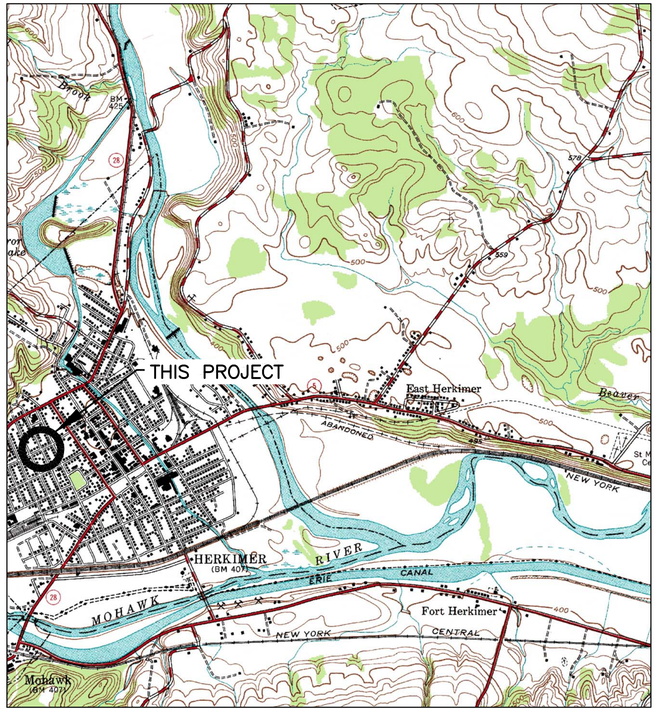
3. Any anchorage or mulch that has not disintegrated at time of first mowing, shall be removed. Anchors may be removed or driven flush with ground surface.

E. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.

F. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed and mulch. The Contractor shall submit all data regarding materials and application rates to the Engineer for review.

G. The stand of grass resulting from the seeding shall not be considered satisfactory until accepted by the Engineer. An acceptable lawn shall have a minimum of 90% of the area covered with plants of the specified seed mix and no areas greater than one foot square of bare surface. If areas are determined to be unacceptable, the remaining mulch will be removed and all areas shall be reseeded, refertilized and remulched as per the above application procedures at the Contractor's expense.

* * * * *




PROJECT LOCATION PLAN

NOT TO SCALE

Design Drawings

# FORMER HERKIMER MGP SITE
# HERKIMER COUNTY, NY

# SITE NO. V00471-6

# REMEDIAL DESIGN

nationalgrid

## HERKIMER, NEW YORK

## NOVEMBER 2012

O'BRIEN & GERE

I JAMES R. HECKATHORNE CERTIFY THAT I AM CURRENTLY A NYS REGISTERED PROFESSIONAL ENGINEER OR QUALIFIED ENVIRONMENTAL PROFESSIONAL AS DEFINED IN 6 NYCRR PART 375 AND THAT THIS REMEDIAL DESIGN WAS PREPARED IN ACCORDANCE WITH ALL APPLICABLE STATUES AND REGULATIONS AND IN SUBSTANTIAL CONFORMANCE WITH THE DER TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION (DER-10).

IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

STATE OF NEW YORK
JAMES R. HECKATHORNE
56609
LICENSED PROFESSIONAL ENGINEER

## INDEX TO DRAWINGS



1118.45595.001

I:\NATIONAL-GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\CONTRACT DRAWINGS\45595-001-TSG1.DWG

## SURVEY NOTES:

1. THE HORIZONTAL AND VERTICAL DATUMS ARE NAD 1983 AND NAVD 1988.
2. THE BOUNDARY SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF AN ABSTRACT OF TITLE.

## GENERAL NOTES – ALL DRAWINGS:

1. EXISTING SITE SURVEY INFORMATION PRESENTED HERE WAS ADOPTED FROM A SURVEY MAP ENTITLED "NATIONAL GRID WEST SMITH ST. SITE TOPOGRAPHIC AND BOUNDARY SURVEY", VILLAGE OF HERKIMER, HERKIMER COUNTY, NEW YORK" DATED JANUARY 13, 2012 PREPARED BY RICHARD M. RYBINSKI, L.S. 8236 INDIAN HILL ROAD MANLIUS, NEW YORK 13104 (315) 682–4852.
2. EXACT DIMENSIONS AND LOCATIONS OF ALL STRUCTURES AND UTILITIES ARE CONSIDERED APPROXIMATE ONLY AND SHALL BE VERIFIED AS REQUIRED IN THE FIELD BY THE CONTRACTOR.
3. OTHER UTILITIES MAY EXIST, THE LOCATIONS, DEPTHS AND EXTENT OF WHICH ARE UNKNOWN. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND ELEVATION OF ALL UTILITIES IN THE FIELD AS IT MAY PERTAIN TO THE CONTRACTOR'S WORK PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UNDER AND ABOVE GROUND UTILITIES DURING CONSTRUCTION UNLESS OTHERWISE NOTED.
5. FOR INFORMATION: DIG SAFELY NEW YORK PHONE NUMBER: 1–800–962–7962. WEBSITE: WWW.DIGSAFELYNEWYORK.COM
6. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY DE–ENERGIZING, OR INTERRUPTION OF SERVICE, REMOVAL, RELOCATION, REPLACEMENT OF ANY UTILITIES POLES, GUY WIRES, UNDERGROUND UTILITIES AND/OR OVERHEAD WIRES WITHIN THE LIMITS OF WORK, OR THAT COULD OTHERWISE INTERFERE WITH THE CONSTRUCTION.
7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF DIFFERENCES BETWEEN THE BASE MAP INFORMATION PROVIDED AND ACTUAL SITE CONDITIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL DURING THE PERFORMANCE OF WORK AND VERIFYING EXISTING GRADES. THE OWNER WILL PROVIDE THE CONTRACTOR WITH THE CONTRACT DRAWINGS IN ELECTRONIC FORMAT FOR THE CONTRACTOR'S USE.
9. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED.
10. THE CONTRACTOR SHALL RESTORE TO PRECONSTRUCTION CONDITIONS, OR BETTER, ALL SUPPORT AREAS THAT ARE IMPACTED BY REMEDIAL ACTIVITIES, INCLUDING BUT NOT LIMITED TO, EQUIPMENT AND MATERIAL STORAGE AREAS, MATERIAL LOADING AND STAGING AREAS, PARKING AREAS, AND LOCATIONS OF OFFICE TRAILERS, UNLESS OTHERWISE NOTED.
11. ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED BY THE CONTRACTOR SHALL BE RESTORED TO PRECONSTRUCTION CONDITIONS OR BETTER IN A TIMELY MANNER AND PRIOR TO CONTRACTOR DEMOBILIZATION.
12. ALL EQUIPMENT OPERATED WITHIN THE LIMITS OF WORK SHALL BE CLEANED IN ACCORDANCE WITH SPECIFICATION 02241 "OFF–SITE TRANSPORTATION AND DISPOSAL" PRIOR TO TRANSPORT OFFSITE AND/OR TRANSPORTING/HANDLING CLEAN BACKFILL MATERIALS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILIZATION, CHARACTERIZATION, LOADING, TRANSPORTATION, AND OFFSITE DISPOSAL OF WASTE MATERIAL GENERATED AS A RESULT OF EXCAVATION ACTIVITIES AT A DISPOSAL FACILITY APPROVED BY THE OWNER.
14. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE CHANNELS AT ALL TIMES. WORK SHALL BE CONDUCTED IN SUBSTANTIVE COMPLIANCE WITH THE PROJECT STORMWATER POLLUTION PREVENTION PLAN, EROSION AND SEDIMENT CONTROL PLAN, AND SPECIFICATION 02270 "EROSION AND SEDIMENT CONTROL. DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.
15. ALL INTRUSIVE GROUND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NATIONAL GRID'S "PART 753 PROTECTION OF UNDERGROUND FACILITIES".
16. ROADWAYS ARE TO REMAIN OPEN AT ALL TIMES.

## REMOVAL OF EXISTING STRUCTURES:

1. THE CONTRACTOR SHALL REMOVE ALL FORMER STRUCTURES WITHIN THE PROPERTY BOUNDARIES (E.G. ASPHALT, CONCRETE, ABANDONED PIPES, STONE WALLS, RAISED GARDEN BEDS, FENCING, ETC) AND DISPOSE OF OFF–SITE AT AN OWNER–APPROVED FACILITY LICENSED OR PERMITTED TO RECEIVE WASTE MATERIAL OF THIS TYPE IN ACCORDANCE WITH SPECIFICATION 02221 "EARTHWORK".

## WELL DATA TABLE/SCHEDULE

**WELLS TO BE MAINTAINED**

| Well No. | Ground Elevation (ft) | Top of Protective Casing Elevation (ft) | Top of PVC Casing Elevation (ft) | Well Depth (ft bgs) | Screen interval (ft bgs) | Well Diameter (in) |
|---|---|---|---|---|---|---|
| MW-01 | 384.38 | 384.41 | 384.04 | 14 | 4 - 14 | 2 |
| MW-02 | 384.41 | 384.49 | 384.09 | 14 | 4 - 14 | 2 |
| MW-03 | 385.35 | 385.35 | 384.86 | 14 | 4 - 14 | 2 |
| MW-04 | 385.06 | 385.11 | 384.96 | 14 | 4 - 14 | 2 |

**WELLS TO BE DECOMMISSIONED**

| | | | | | | |
|---|---|---|---|---|---|---|
| KW-01 | 385.18 | 385.19 | 384.96 | 17 | 12 - 17 | 2 |
| KW-02 | 384.88 | 384.84 | 384.31 | 20 | 15 - 20 | 2 |
| TW-01 | 385.04[1] | NA | 384.92 | 18 | 8 - 18 | 2 |

NA: Not Available
NP: Not Present
[1] Elevation from SB-41R

## NOTES:

1. WELLS TO BE MAINTAINED – REFER TO "MONITORING WELL RESTORATION DETAIL" SHT. G–8 FOR RESTORATION OF MONITORING WELLS DISTURBED DURING CONSTRUCTION SCHEDULED TO BE MAINTAINED.
2. WELLS TO BE ABANDONED – REFER TO SPECIFICATION 02145 "GROUNDWATER MONITORING WELL DECOMMISSIONING" FOR MONITORING WELL ABANDONMENT REQUIREMENTS.
3. REFER TO DRAWING G–2 FOR ALL MONITORING WELL LOCATIONS.

## LEGEND:

- PROPERTY BOUNDARY
- STREET LINE
- 366 EXISTING ELEVATION CONTOUR
- 366 PROPOSED ELEVATION CONTOUR
- OH/EL <Dy OH/EL NM 4 POLE W/OVERHEAD ELECTRIC WIRES
- SB–52 SOIL BORING
- KW–01 MONITORING WELL
- CONC CURB CONCRETE CURB
- SANITARY MANHOLE
- 6" MAPLE TREE
- 6' CHAIN LINK FENCE
- 191.33' M 196.44' D DEED DISTANCE
- CONC SW CONCRETE SIDEWALK
- SF SILT FENCE
- APPROX. LIMITS OF IMPACTED SOIL
- PROPOSED SHEETING

| NO. | DATE | REVISION | INIT. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| 1 | 11/2/12 | ISSUED FOR BID | JRH |
| 0 | 4/27/12 | ISSUED FOR NYSDEC REVIEW | JRH |

NOT TO SCALE



STATE OF NEW YORK JAMES R. HECKATHORNE 56609 LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471–6

REMEDIAL DESIGN

GENERAL

# GENERAL NOTES AND LEGEND

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.002
DATE NOVEMBER 2012

G–1

I:\NATIONAL–GRID.1118\45595.HERKIMER–RAMP\DOCS\DWG\CONTRACT DRAWINGS\45595–001–TSG1.DWG

WEST SMITH STREET (50' WIDE)

WILLIAMS STREET (50' WIDE)

TARVIA DRIVE

CONC. DRIVE

STREET LINE

CONC SW

CONC CURB

STOP SIGN

NM 4

NM 7
NYT 100

BENCHMARK:
RR SPIKE IN WEST
SIDE OF POLE NM-7
TOP OF SPIKE = 386.60

NM 7
L 199

BRICK CHIMNEY

HOUSE

GATE

6' WOOD FENCE

MAPLE

FORMER GAS HOLDER PAD

IMPACTED SOIL AREA

CONCRETE PAD

TARVIA

GRASS

GRAVEL DRIVE

CONC DRIVE

BLOCK FIREPLACE

RAISED BED GARDEN

24" BOX ELDER STUMP

6" ASH

STONE WALL

WOOD STAIRS

BLOCK WALL

BLOCK GARAGE

Test Pit 1

Test Pit 2

Test Pit 4

Test Pit 5

SB-1 SB-2 SB-3 SB-4 SB-5 SB-6 SB-7 SB-8 SB-9 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15 SB-16 SB-17 SB-18 SB-19 SB-20 SB-21 SB-21R SB-22 SB-23 SB-24 SB-24R SB-25 SB-25R SB-26 SB-27 SB-28 SB-31 SB-31B SB-32 SB-32B SB-33 SB-33B SB-34 SB-35 SB-36 SB-37 SB-38 SB-39 SB-40 SB-41R SB-42 SB-43 SB-44 SB-45 SB-46 SB-47 SB-48 SB-49 SB-49B SB-49C SB-49D SB-50 SB-52 SB-53 SB-54 SB-55 SB-56 SB-57 SB-58 SB-59 SB-60

MW-01 MW-02 MW-03 MW-04

SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11

TW-01

KW-01 KW-02

ROBIN OWENS, N/F
BK 1351 PG 330
TM 120.033-02

MARK A. NETTI, N/F
BK 908 PG 180
TM 120.033-03
0.585 +/- ACRES

MICHAEL A. MAIDA, N/F
BK 1375 PG 568
TM 120.033-04

JOSEPH J. & SYLVIA D. GRANDE, N/F
BK 797 PG 418
TM 120.033-05
LOT 1 OF MAP OF ALLOTMENT BOARDERING
DEWEY AVE. & WILLIAMS ST. DATED SEPT.1901
FILED BOOK OF MAPS 5 PAGE 18-1.

MARK A. NETTI, N/F
BK 844 PG 77
TM 120.033-33

NOTE:
PROPERTY LINE PER DEED BK 797 PG 418
180' TO THE EAST LINE OF DEWEY AVE. PROPERTY
LINE PER "MAP OF DEWEY AVE. & WILLIAM ST." FILED
SEPT. 1901 IN BOOK OF MAPS 5 PAGE 18-1 180' TO
THE EAST LINE DEWEY AVE. AND 132' TO THE WEST LINE
OF WILLIAMS ST. PROPERTY LINE PER DEED BK 844
PG 77 145' TO THE WEST LINE OF WILLIAMS ST.

DRAWING NOTES:

1. ALL INFORMATION SHOWN HERE DEPICTS EXISTING SITE CONDITIONS ADOPTED FROM A SURVEY MAP ENTITLED "NATIONAL GRID WEST SMITH ST. SITE TOPOGRAPHIC AND BOUNDARY SURVEY", VILLAGE OF HERKIMER, HERKIMER COUNTY, NEW YORK" DATED JANUARY 13, 2012 PREPARED BY RICHARD M. RYBINSKI, L.S. 8236 INDIAN HILL ROAD MANLIUS, NEW YORK 13104 (315) 682-4852.
2. THE CONTRACTOR SHALL CLEAR AND GRUB THE ENTIRE SITE IN ACCORDANCE WITH SPECIFICATION 02211 "CLEARING AND GRUBBING".

| NO. | DATE | REVISION | INIT. |
|---|---|---|---|
| 1 | 11/2/12 | ISSUED FOR BID | JRH |
| 0 | 4/27/12 | ISSUED FOR NYSDEC REVIEW | JRH |

1"=10' 10 0 10 20

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IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

STATE OF NEW YORK
JAMES R. HECKATHORNE
56609
LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

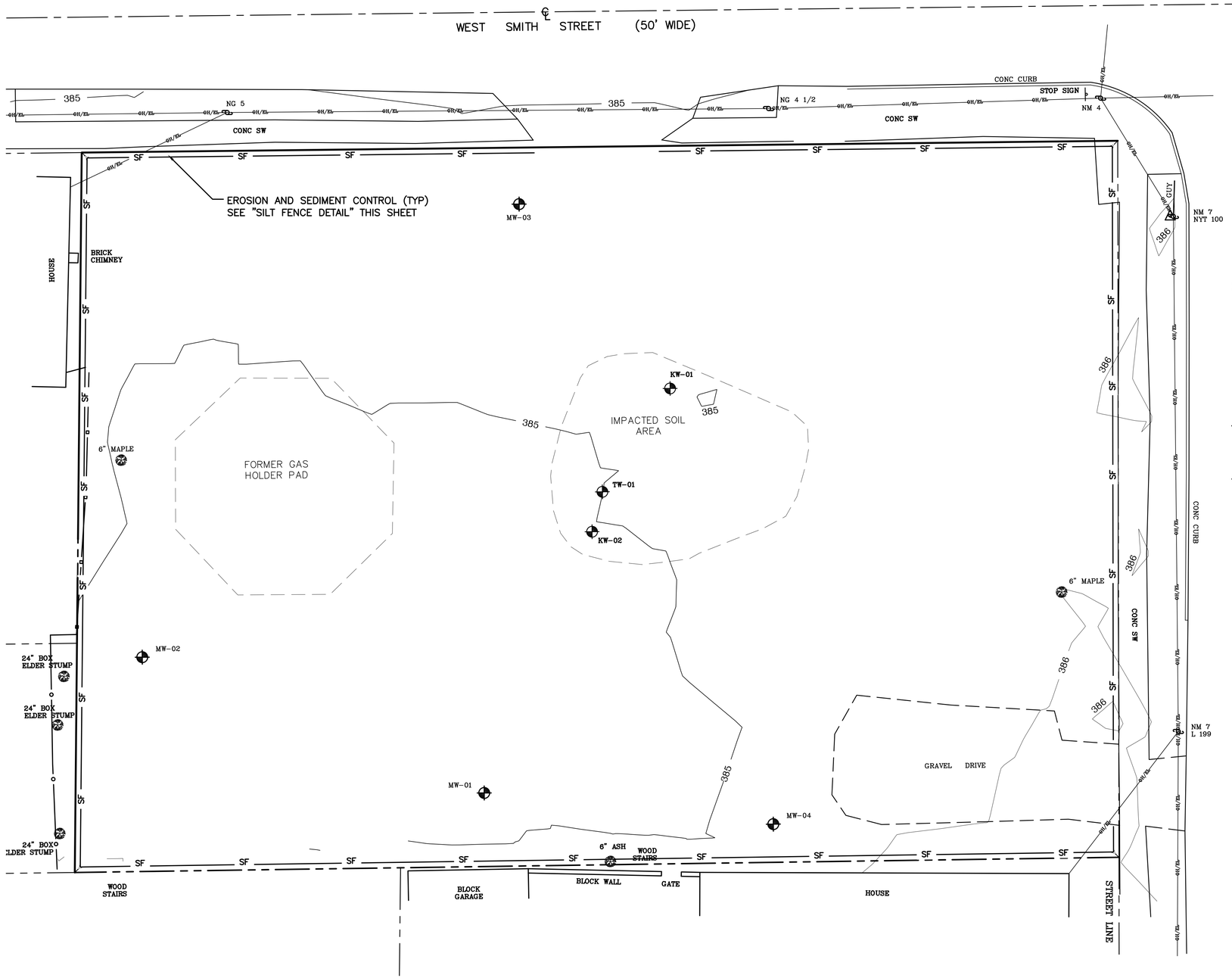
GENERAL

# EXISTING SITE PLAN

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH
FILE NO. 1118.45595.003
DATE NOVEMBER 2012

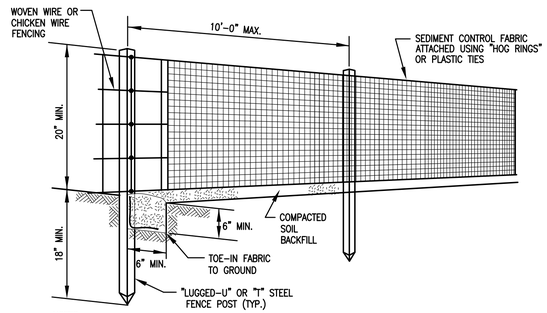
G-2

I:\NATIONAL-GRID.1118\45595.HERKIMER-RAMP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-G2G3G4G5G6G7.DWG




## DRAWING NOTES:

1. ALL SILT FENCE LOCATIONS SHOWN HERE ARE APPROXIMATE ONLY AND SHALL BE PROVIDED AT A MINIMUM.
2. THE CONTRACTOR SHALL MAINTAIN OR PROVIDE BYPASS OF FLOW FROM EXISTING DRAINAGE CHANNELS AT ALL TIMES. PROPER EROSION CONTROL TECHNIQUES SHALL BE IMPLEMENTED AS REQUIRED IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED EROSION AND SEDIMENT CONTROL PLAN, SPECIFICATION 02270 "EROSION AND SEDIMENT CONTROL" AND SPECIFICATION 02110 "STORMWATER POLLUTION PREVENTION".
3. THE CONTRACTOR SHALL INSTALL EROSION AND CONTROL MEASURES PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION.




NOTES:

1. SILT FENCE SHALL BE PLACED AS INDICATED ON THE GRADING/EROSION CONTROL PLAN AND AS DESCRIBED IN THE PROJECT SWPPP.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER- LAPPED BY SIX INCHES AND FOLDED.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
6. FENCE TO BE ALIGNED ALONG CONTOUR AS CLOSELY AS POSSIBLE.
7. FENCE SHALL BE DOUBLED AT THE TOE OF ALL SLOPES GREATER THAN 15 PERCENT, AND ADJACENT TO WATER BODIES.

POSTS : STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE : WOVEN WIRE 14.5 GAUGE 6" MAX. MESH OPENING

FILTER CLOTH : MINIMUM TENSILE STRENGTH OF 120 LBS. (ASTM D-16826)

PREFABRICATED UNIT : MIRAFI ENVIROFENCE, OR APPROVED EQUAL

STANDARD SYMBOL ——SF——SF

## SILT FENCE DETAIL

NOT TO SCALE

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|---|---|---|---|
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| 0 | 4/27/12 | ISSUED FOR NYSDEC REVIEW | JRH |

1"=10' 10 0 10 20

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STATE OF NEW YORK JAMES R. HECKATHORNE 58609 LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

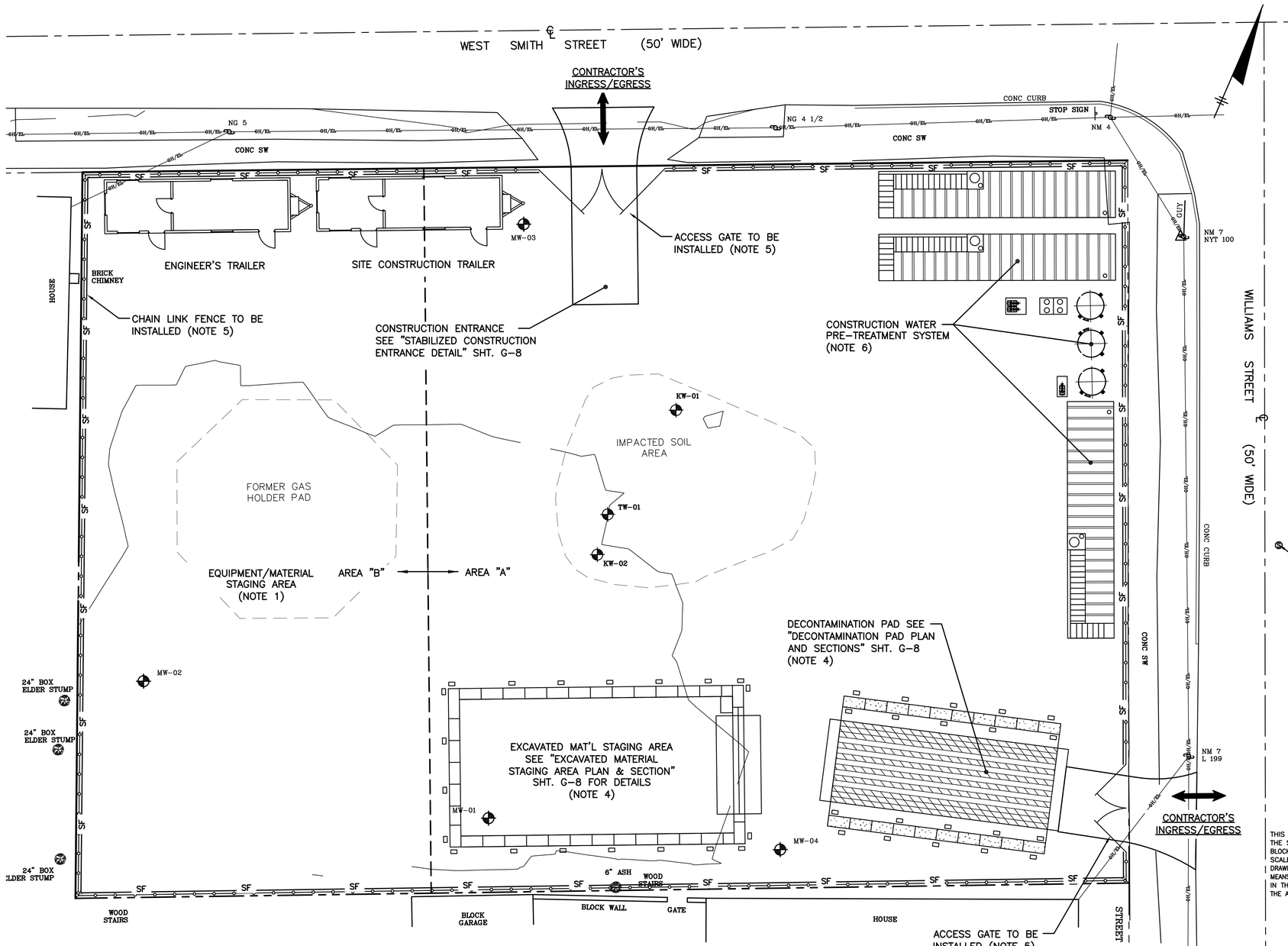
# EROSION & SEDIMENT CONTROL PLAN

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.004
DATE NOVEMBER 2012

G-3

I:\NATIONAL-GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-G2G3G4G5G6G7.DWG




DRAWING NOTES:

1. ALL SOIL LOCATED WITHIN THE PROPERTY BOUNDARIES AND AREA "A" SHALL BE EXCAVATED TO A DEPTH OF TWO FEET BELOW GRADE. THE EXCAVATED SOIL SHALL BE STOCKPILED ON-SITE WITHIN AREA "B" AND EVALUATED FOR RE-USE AS BACKFILL BELOW THE DEMARCATION LAYER.

2. THE CONTRACTOR MAY, AT THE CONTRACTOR'S DISCRETION INSTALL ALL OR A PORTION OF THE DEMARCATION LAYER AND 6 INCHES OF CRUSHED STONE, A COMPONENT OF THE SOIL COVER, TO SERVE AS A WORKING SURFACE DURING CONSTRUCTION. IF, AT THE CONCLUSION OF CONSTRUCTION, THE 6 INCH CRUSHED STONE LAYER IS DEMONSTRATED BY THE CONTRACTOR TO THE SATISFACTION OF THE CRITERIA PRESENTED IN 6NYCRR PART 375, IT MAY BE INCORPORATED INTO THE FINAL SOIL COVER. THE COST OF ANY SAMPLING REQUIRED TO DEMONSTRATE THAT THE CRUSHED STONE MEETS THE BACKFILL CRITERIA PRESENTED IN 6NYCRR PART 375 IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. IF IT CANNOT BE DEMONSTRATED TO THE SATISFACTION OF THE ENGINEER, NATIONAL GRID, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION THAT THE CRUSHED STONE LAYER MEETS THE BACKFILL CRITERIA PRESENTED IN 6NYCRR PART 375, THIS LAYER SHALL BE REMOVED, PROPERLY DISPOSED OF, AND REPLACED AT NO ADDITIONAL COST TO NATIONAL GRID.

3. EXCAVATED SOILS CONTAINING GREATER THAN 500 PPM TOTAL PAH'S (REMOVAL CRITERIA) SHALL BE TRANSPORTED OFF-SITE IN ACCORDANCE WITH SPECIFICATION 02241 "OFF-SITE TRANSPORTATION AND DISPOSAL". EXCAVATED SOILS CONTAINING LESS THAN THE REMOVAL CRITERIA SHALL BE RE-USED AS BACKFILL BELOW THE DEMARCATION LAYER.

4. STAGING AREAS SHOWN HERE ARE FOR THE CONTRACTOR'S USE FOR STAGING EQUIPMENT, MATERIALS, TRAILERS, PARKING, ETC. AND ARE SHOWN FOR REFERENCE PURPOSES ONLY. PRIOR TO COMMENCEMENT OF WORK THE CONTRACTOR SHALL SUBMIT A STAGING PLAN WHICH WILL INCLUDE METHODS AND SEQUENCING OF ALL INTENDED OPERATIONS IN ACCORDANCE WITH SP-13 STAGING PLAN.

5. THE CONTRACTOR SHALL PROVIDE ALL ELEMENTS OF WORK AREA SECURITY NECESSARY TO PREVENT THE UNAUTHORIZED ENTRY OF PERSONS ONTO THE SITE. THE CONTRACTOR SHALL ERECT AND MAINTAIN A 6 FT TALL CHAIN LINK FENCE, INCLUDING GATES, AND PRIVACY SLATS AROUND THE ENTIRE SITE FOR THE DURATION OF THE PROJECT. REFER TO SP-2 "CONTRACT WORK AREA SECURITY".

6. THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION WATER PRE-TREATMENT SYSTEM IN ACCORDANCE WITH SPECIFICATION 02141. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF HERKIMER FOR REQUIREMENTS RELATED TO DISCHARGING TO THE CITY SANITARY SEWER. IF PERMITTED BY THE CITY, CLEAN WATER DISCHARGE PIPING FROM THE CONSTRUCTION WATER PRE-TREATMENT SYSTEM WILL RUN FROM THE PRE-TREATMENT SYSTEM AND DISCHARGE INTO THE EXISTING SANITARY SEWER MANHOLE LOCATED ON WILLIAMS STREET.

7. THE FOLLOWING MONITORING WELLS SHALL BE ABANDONED IN ACCORDANCE WITH SPECIFICATION 02145 "GROUNDWATER MONITORING WELL DECOMMISIONING":

   KW-01 KW-02 TW-01

8. REFER TO "TYPICAL SOIL COVER DETAIL" SHEET G-8 FOR RESTORATION

| NO. | DATE | REVISION | INIT. |
|---|---|---|---|
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1"=10' 10 0 10 20

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STATE OF NEW YORK JAMES R. PECKARSKY 065699 LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

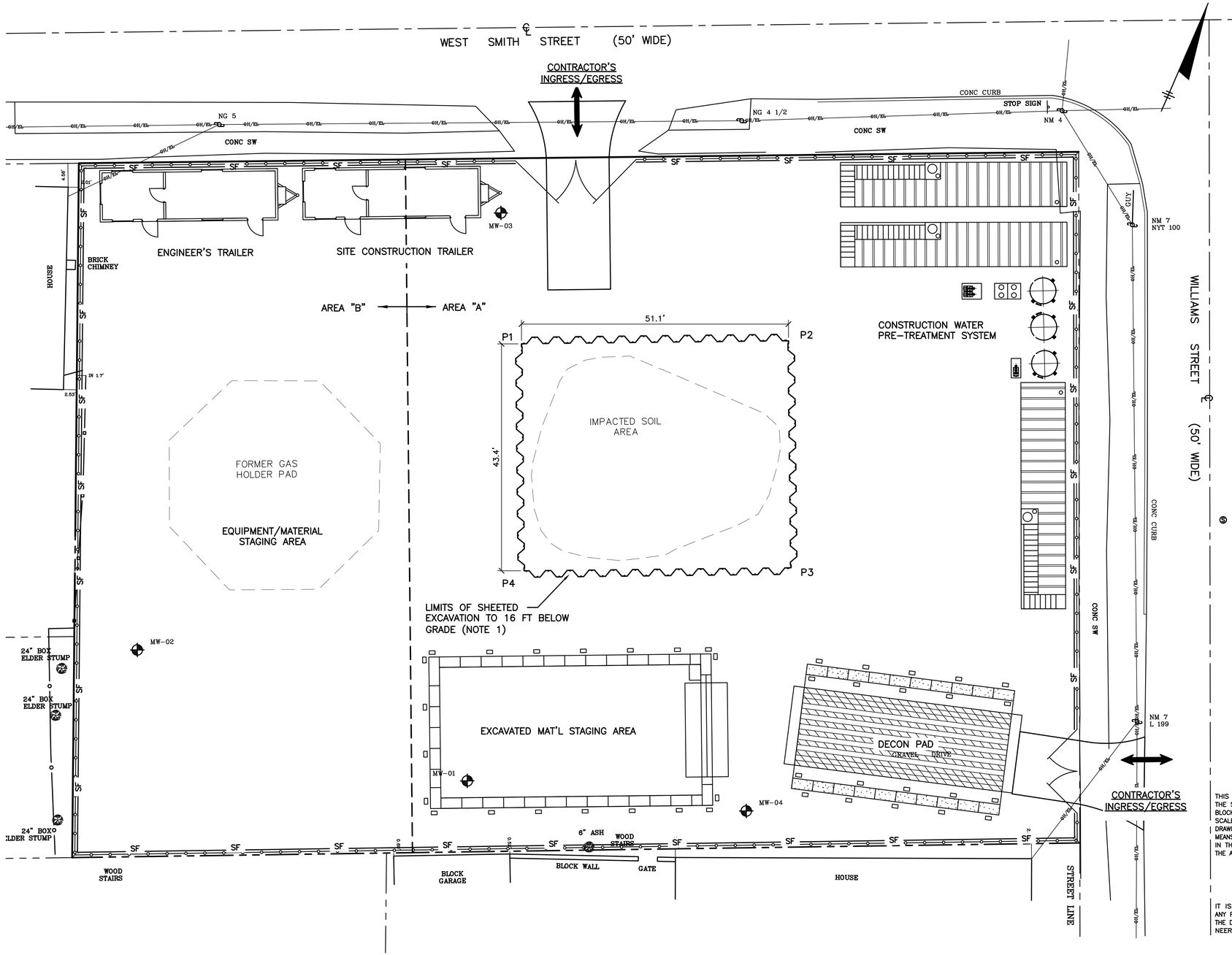
# SITE PREPARATION PLAN

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.004
DATE NOVEMBER 2012

G-4

i:\NATIONAL_GRID.1118\45595.HERKIMER_RAWP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-G2G3G4G5G6G7.DWG




## DRAWING NOTES:

1. LIMITS OF EXCAVATION SHOWN HERE SHALL EXTEND TO APPROXIMATELY SIXTEEN FEET BELOW GRADE. THE TOP FOUR TO SIX FEET OF SOIL THAT DOES NOT EXCEED THE REMOVAL CRITERIA, AS DETERMINED BY THE ENGINEER AND IN CONSULTATION WITH THE NYSDEC, SHALL BE EXCAVATED, STOCKPILED ON-SITE AND EVALUATED FOR RE-USE AS BACKFILL BELOW THE DEMARCATION LAYER.
2. EXCAVATED SOILS CONTAINING GREATER THAN 500 PPM TOTAL PAH'S (REMOVAL CRITERIA) SHALL BE TRANSPORTED OFF-SITE IN ACCORDANCE WITH SPECIFICATION 02241 "OFF-SITE TRANSPORTATION AND DISPOSAL".
3. CONSTRUCTION WATER ENCOUNTERED DURING EXCAVATION SHALL BE PRE-TREATED AND DISCHARGED TO THE SANITARY SEWER IN ACCORDANCE WITH SPECIFICATION 02141 "CONSTRUCTION WATER MANAGEMENT".
4. REFER TO "TYPICAL SHEET PILE DETAILS, SECTIONS AND NOTES" SHEET G-10.

| POINT TABLE | | |
|---|---|---|
| POINT NO. | NORTHING | EASTING |
| P1 | 1526525.79 | 362320.00 |
| P2 | 1526546.49 | 362366.71 |
| P3 | 1526506.78 | 362384.31 |
| P4 | 1526486.08 | 362337.59 |

| NO. | DATE | REVISION | INIT. |
|---|---|---|---|
| 1 | 11/2/12 | ISSUED FOR BID | JRH |
| 0 | 4/27/12 | ISSUED FOR NYSDEC REVIEW | JRH |

1"=10' 10 0 10 20

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O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL
PHASE I

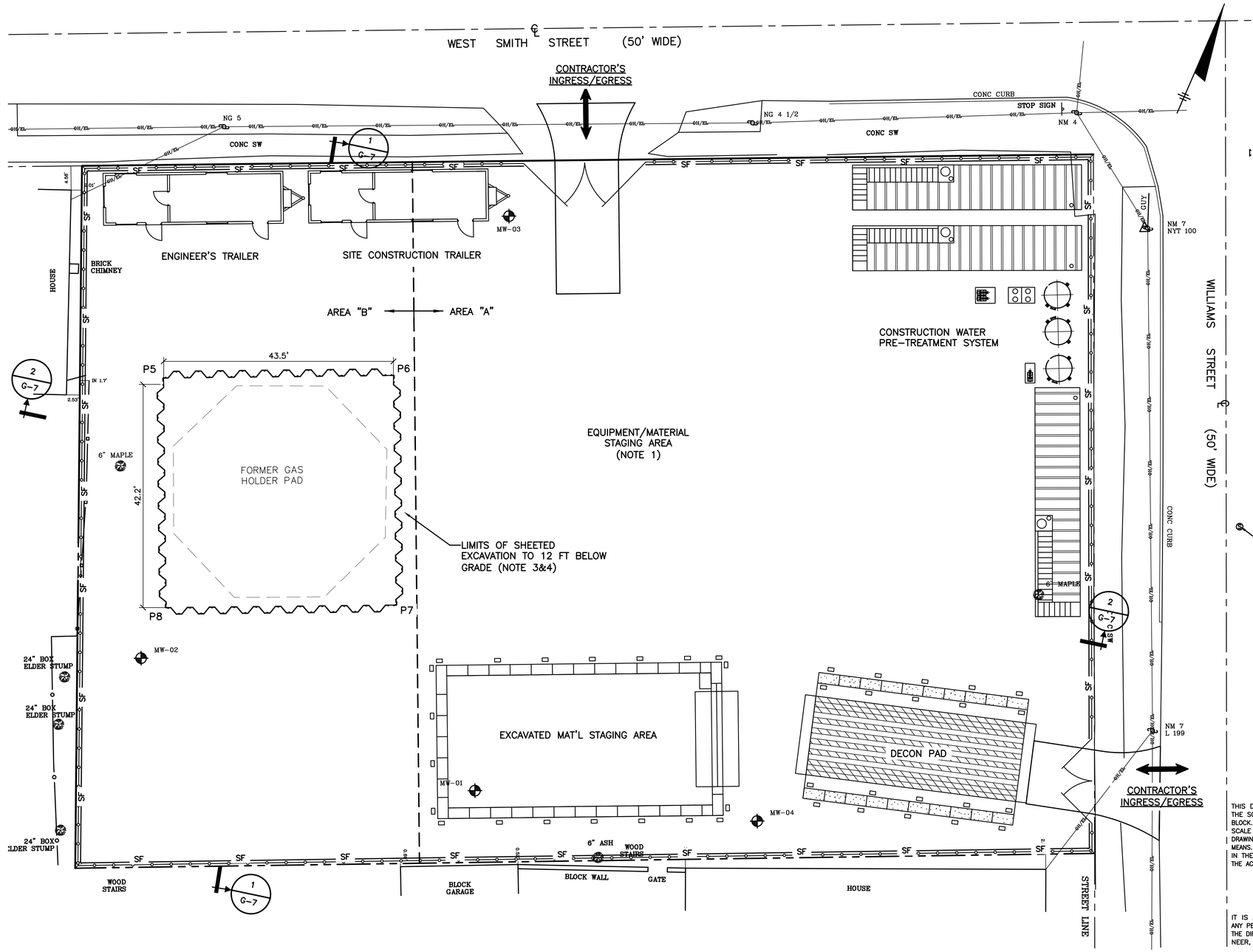
# LIMITS OF SHEETED EXCAVATION PLAN

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.005
DATE NOVEMBER 2012

G-5

I:\NATIONAL-GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-020304050607.DWG




DRAWING NOTES:

1. ALL SOIL LOCATED WITHIN THE PROPERTY BOUNDARIES AND AREA "B" SHALL BE EXCAVATED TO A DEPTH OF TWO FEET BELOW GRADE. THE EXCAVATED SOIL SHALL BE STOCKPILED ON-SITE WITHIN AREA "A" AND EVALUATED FOR RE-USE AS BACKFILL BELOW THE DEMARCATION LAYER.
2. THE CONTRACTOR MAY, AT THE CONTRACTOR'S DISCRETION INSTALL ALL OR A PORTION OF THE DEMARCATION LAYER AND 6 INCHES OF CRUSHED STONE, A COMPONENT OF THE SOIL COVER, TO SERVE AS A WORKING SURFACE DURING CONSTRUCTION. IF, AT THE CONCLUSION OF CONSTRUCTION, THE 6 INCH CRUSHED STONE LAYER IS DEMONSTRATED BY THE CONTRACTOR TO THE SATISFACTION OF THE CRITERIA PRESENTED IN 6NYCRR PART 375, IT MAY BE INCORPORATED INTO THE FINAL SOIL COVER. THE COST OF ANY SAMPLING REQUIRED TO DEMONSTRATE THAT THE CRUSHED STONE MEETS THE BACKFILL CRITERIA PRESENTED IN 6NYCRR PART 375 IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. IF IT CANNOT BE DEMONSTRATED TO THE SATISFACTION OF THE ENGINEER, NATIONAL GRID, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION THAT THE CRUSHED STONE LAYER MEETS THE BACKFILL CRITERIA PRESENTED IN 6NYCRR PART 375, THIS LAYER SHALL BE REMOVED, PROPERLY DISPOSED OF, AND REPLACED AT NO ADDITIONAL COST TO NATIONAL GRID.
3. PRIOR TO DRIVING SHEETING, THE CONTRACTOR SHALL VERIFY THE LOCATION OF THE FORMER GAS HOLDER PAD BY MEANS OF TEST PITS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. LIMITS OF EXCAVATION SHOWN HERE SHALL EXTEND TO APPROXIMATELY TWELVE FEET BELOW GRADE. THE TOP FOUR TO SIX FEET OF SOIL THAT DOES NOT EXCEED THE REMOVAL CRITERIA, AS DETERMINED BY THE ENGINEER AND IN CONSULTATION WITH THE NYSDEC, SHALL BE EXCAVATED, STOCKPILED ON-SITE AND EVALUATED FOR RE-USE AS BACKFILL BELOW THE DEMARCATION LAYER.
5. EXCAVATED SOILS CONTAINING GREATER THAN 500 PPM TOTAL PAH'S (REMOVAL CRITERIA) SHALL BE TRANSPORTED OFF-SITE IN ACCORDANCE WITH SPECIFICATION 02241 "OFF-SITE TRANSPORTATION AND DISPOSAL".
6. CONSTRUCTION WATER ENCOUNTERED DURING EXCAVATION SHALL BE PRE-TREATED AND DISCHARGED TO THE SANITARY SEWER IN ACCORDANCE WITH SPECIFICATION 02141 "CONSTRUCTION WATER MANAGEMENT".
7. REFER TO "TYPICAL SHEET PILE DETAILS, SECTIONS AND NOTES" SHEET G-10.

| POINT TABLE | | |
|---|---|---|
| POINT NO. | NORTHING | EASTING |
| P5 | 1526493.26 | 362258.46 |
| P6 | 1526510.97 | 362298.42 |
| P7 | 1526471.27 | 362316.01 |
| P8 | 1526453.56 | 362276.05 |

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1"=10' 10 0 10 20

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O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL
PHASE II
# LIMITS OF SHEETED EXCAVATION PLAN

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.006
DATE NOVEMBER 2012

G-6

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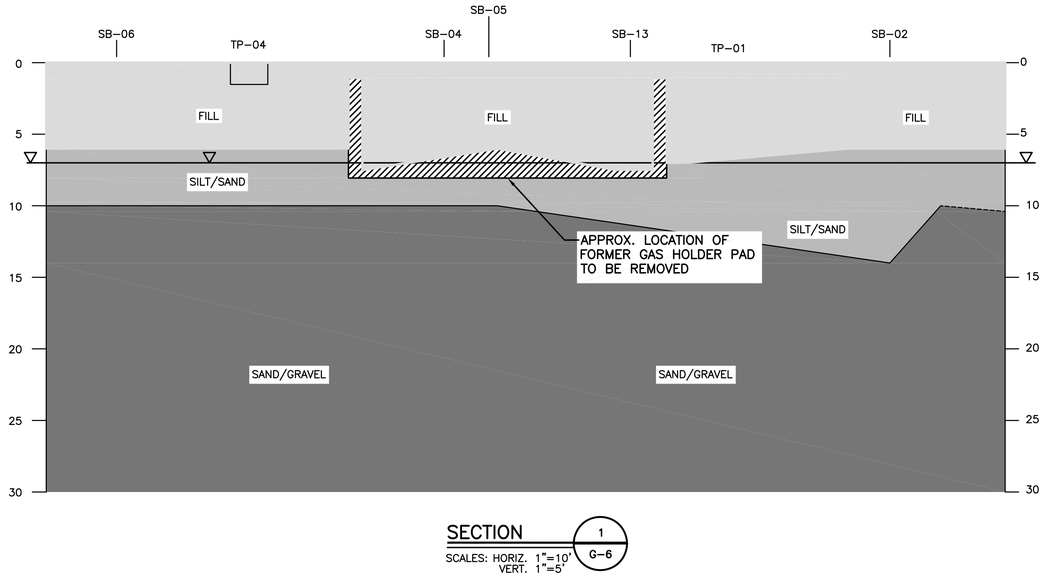
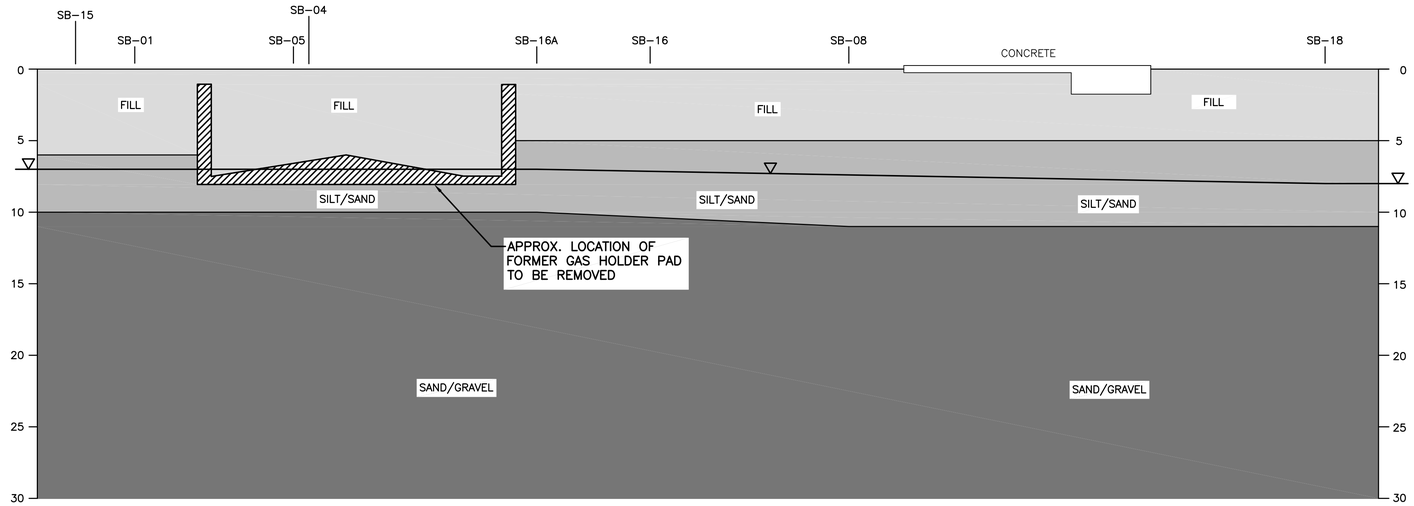



SECTION 1 / G-6

SCALES: HORIZ. 1"=10'
VERT. 1"=5'




SECTION 2 / G-6

SCALES: HORIZ. 1"=10'
VERT. 1"=5'

**DRAWING NOTES:**

1. FORMER GAS HOLDER CROSS-SECTIONS SHOWN HERE ADAPTED FROM TRC FIGURE 2 DATED 10/09/08.
2. SUBSURFACE CONDITIONS SHOWN HERE ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ACTUAL CONDITIONS MAY VARY FROM THAT SHOWN.
3. THE CONTRACTOR SHALL VERIFY ALL INFORMATION AS REQUIRED TO PERFORM THE WORK.

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| 1 | 11/2/12 | ISSUED FOR BID | JRH |
| 0 | 4/27/12 | ISSUED FOR NYSDEC REVIEW | JRH |

1"=10' 10 0 10 20

1"=5' 5 0 5 10

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STATE OF NEW YORK JENNIFER REZKALLA-FOX 065609 LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

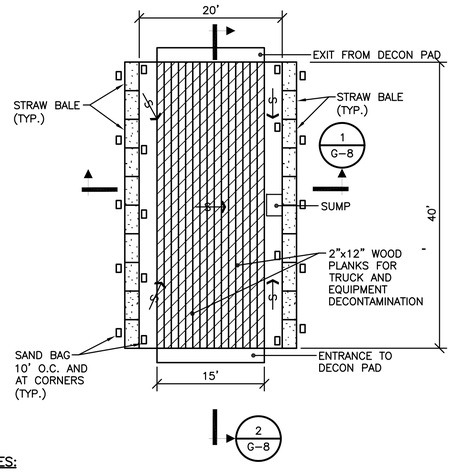
# FORMER GAS HOLDER CROSS SECTIONS

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.107
DATE NOVEMBER 2012

G-7

i:\NATIONAL-GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-G2G3G4G5G6G7.DWG

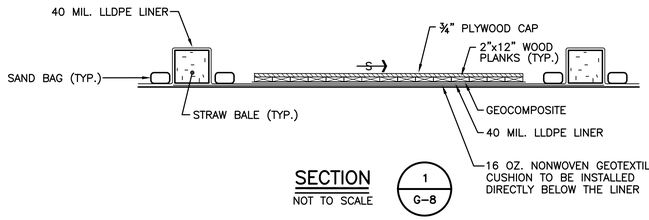



NOTES:

1. THE CONTRACTOR SHALL PLACE SELECT FILL TYPE "D" SAND (NOT SHOWN HERE) AS REQUIRED BENEATH THE NON-WOVEN GEOTEXTILE CUSHION TO PROMOTE DRAINAGE.
2. WATER COLLECTED FROM THE DECONTAMINATION PAD SHALL BE HANDLED IN ACCORDANCE WITH SPECIFICATION 02141 "CONSTRUCTION WATER MANAGEMENT".

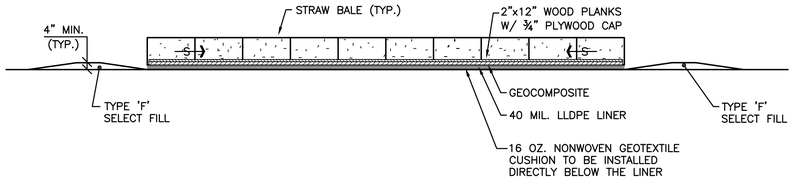
## DECONTAMINATION PAD PLAN

NOT TO SCALE



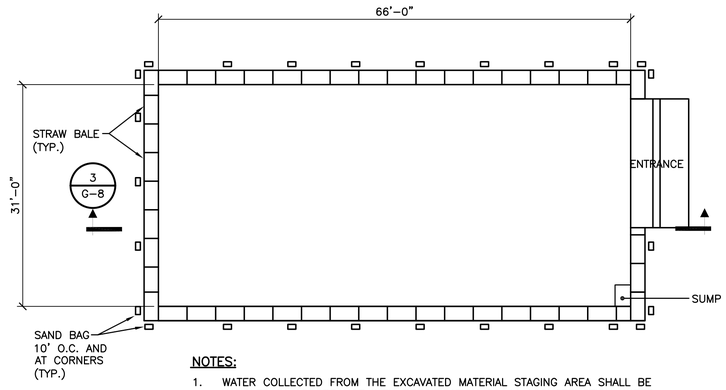

SECTION 1 G-8

NOT TO SCALE




SECTION 2 G-8

NOT TO SCALE

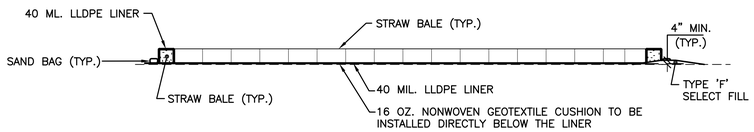



NOTES:

1. WATER COLLECTED FROM THE EXCAVATED MATERIAL STAGING AREA SHALL BE HANDLED IN ACCORDANCE WITH SPECIFICATION 02141 "CONSTRUCTION WATER MANAGEMENT".

## EXCAVATED MATERIAL STAGING AREA PLAN

NOT TO SCALE




SECTION 3 G-8

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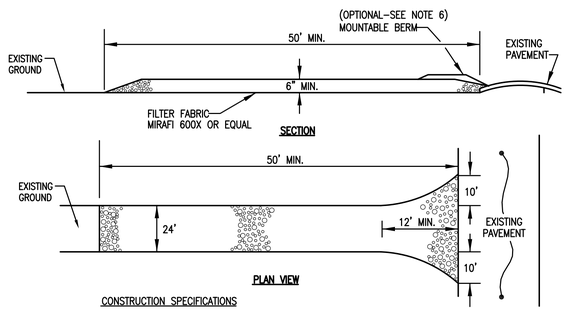
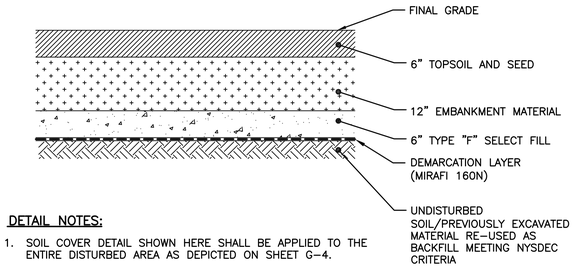



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – AS REQUIRED, BUT NOT LESS THAN 50 FEET
3. THICKNESS – NOT LESS THAN SIX (6) INCHES
4. WIDTH–(24) TWENTY–FOUR FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE EGRESS OCCURS.
5. FILTER FABRIC (MIRAFI 600X OR EQUAL) – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARDS CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS NOT POSSIBLE, A MOUNTABLE BERM 3' WIDE (MIN.) WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO ADJACENT SEDIMENT BASINS.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED IN ACCORDANCE WITH THE PROJECT STORM WATER POLUTION PREVENTION PLAN.

## STABILIZED CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE

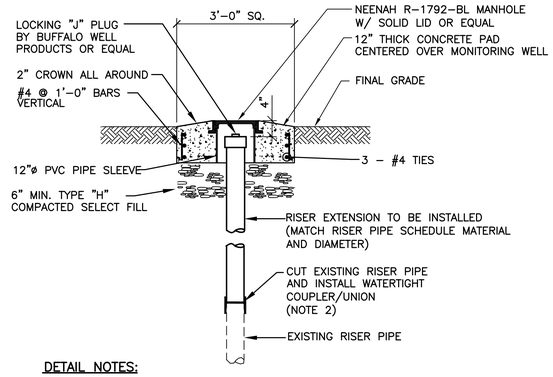



DETAIL NOTES:

1. SOIL COVER DETAIL SHOWN HERE SHALL BE APPLIED TO THE ENTIRE DISTURBED AREA AS DEPICTED ON SHEET G-4.

## TYPICAL SOIL COVER DETAIL

NOT TO SCALE




DETAIL NOTES:

1. DETAIL SHOWN HERE DEPICTS MONITORING WELL RESTORATION.
2. THE CONTRACTOR SHALL CUT THE EXISTING RISER PIPE AT A DEPTH REQUIRED TO PERFORM THE WORK SHOWN HERE OR AS DIRECTED BY THE ENGINEER.

## MONITORING WELL RESTORATION DETAIL

NOT TO SCALE

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O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

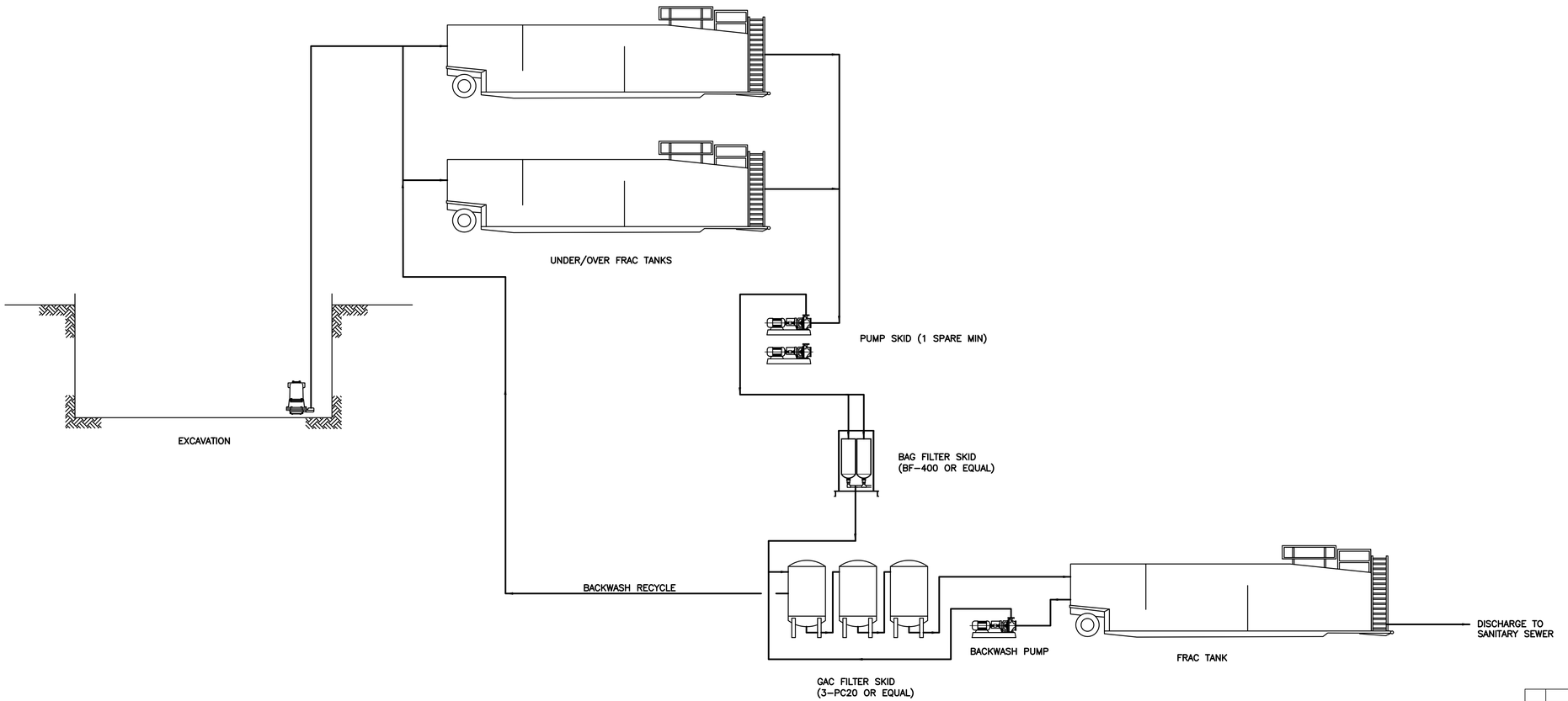
GENERAL

# MISCELLANEOUS DETAILS

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.008
DATE NOVEMBER 2012

G-8

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STATE OF NEW YORK
JAMES R. HECKATHORNE
068609
LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

# CONSTRUCTION WATER TREATMENT SCHEMATIC

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.009
DATE NOVEMBER 2012

G-9

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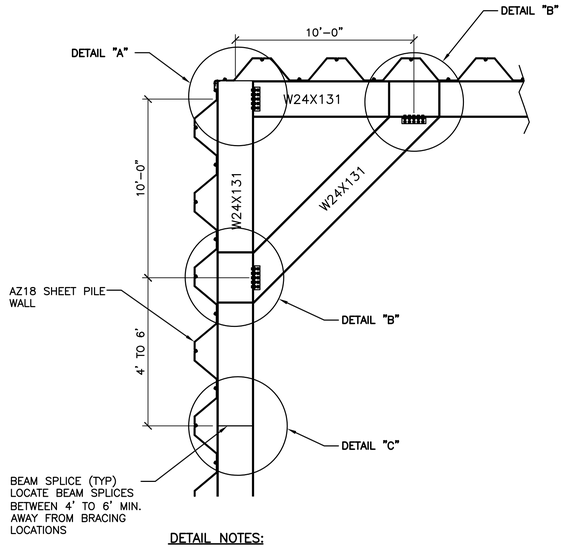
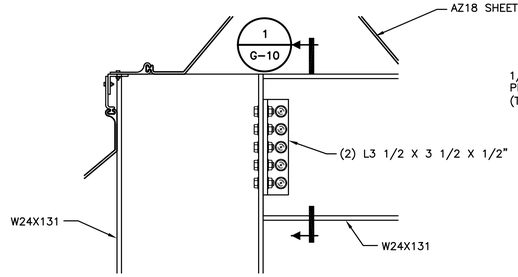



DETAIL NOTES:

1. REFER TO SHEET G-5 FOR LIMITS OF SHEETING.

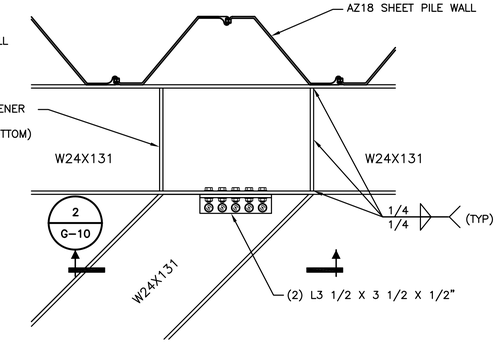
## TYPICAL EXCAVATION SHEET PILE DETAIL

SCALE: 1/4"=1'-0"



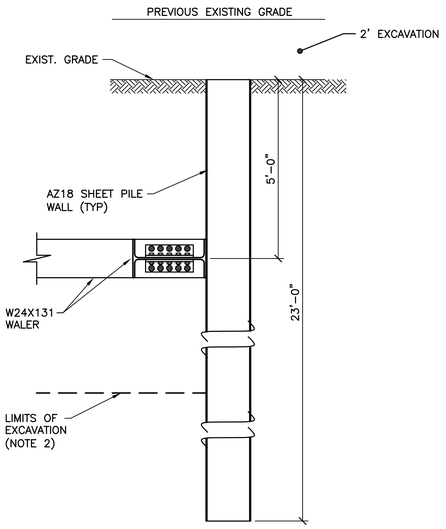

DETAIL A G-10

SCALE: 1"=1'-0"




DETAIL B G-10

SCALE: 3/4"=1'-0"

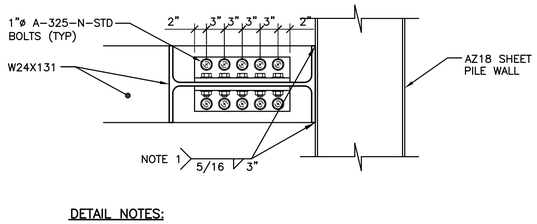


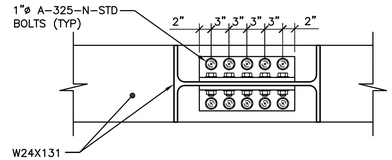

DETAIL NOTES:

1. TYPICAL SHEET PILE SHOWN HERE SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATION 02400 "STEEL SHEET PILING".
2. THE TYPICAL SHEET PILE WALL SECTION SHOWN HERE IS FOR A MAXIMUM EXCAVATION DEPTH OF NO MORE THAN 14'-0". THE CONTRACTOR SHALL EXCAVATE TWO FOOT OF EXISTING SOIL PRIOR TO INSTALLATION OF THE SHEET PILE WALL AS SHOWN HERE.

## TYPICAL SHEET PILE WALL SECTION

NOT TO SCALE




DETAIL NOTES:

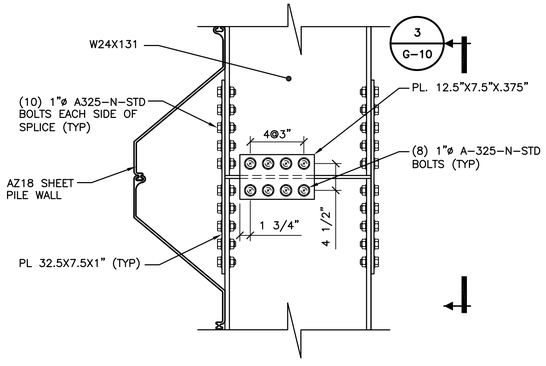
1. PROVIDE WELD AT EACH LOCATION WHERE SHEETING COMES INTO CONTACT WITH WALER BEAM.

SECTION 1 G-10

SCALE: 1"=1'-0"

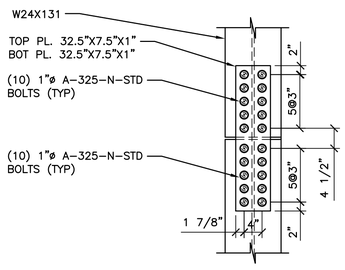
SECTION 2 G-10

SCALE: 1"=1'-0"




DETAIL C G-10

SCALE: 3/4"=1'-0"




SECTION 3 G-10

SCALE: 3/4"=1'-0"

STRUCTURAL STEEL NOTES

1. FABRICATE AND ERECT STRUCTURAL STEEL SYSTEMS IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. STEEL MEMBERS HAVE BEEN PROPORTIONED UTILIZING ALLOWABLE STRESS DESIGN (ASD) METHODS AS PRESCRIBED BY A.I.S.C.
3. STRUCTURAL STEEL SHALL BE DETAILED IN ACCORDANCE WITH "DETAILING FOR STEEL CONSTRUCTION (A.I.S.C.)" AND WHERE REQUIRED, DESIGNED IN ACCORDANCE WITH CITED REFERENCES.
4. STRUCTURAL STEEL SHALL BE NEW AND CONFORM TO: .
   a. UNLESS OTHERWISE NOTED — A.S.T.M. A992 (Fy=50 K.S.I.)
   b. MISC. STRUCTURAL SHAPES & CONNECTIONS — A.S.T.M. A36 (Fy=36 K.S.I.)
   c. HIGH STRENGTH BOLTS — A.S.T.M. A325-N
5. WELDING SHALL CONFORM TO THE REQUIREMENTS OF A.W.S. D1.1, AND SHALL BE PERFORMED BY APPROVED, CERTIFIED PERSONS.
6. WELDED CONNECTIONS SHALL UTILIZE E70XX ELECTRODES.
7. WELDS SHALL DEVELOP THE FULL STRENGTH OF THE MATERIALS BEING WELDED, UNLESS NOTED OTHERWISE, EXCEPT THAT FILLET WELDS SHALL BE A MINIMUM OF 1/4" U.O.N.
8. PRINCIPAL STRUCTURAL BOLTED CONNECTIONS SHALL BE MADE USING 3/4" DIAMETER MINIMUM A.S.T.M. A325 BOLTS IN BEARING CONNECTIONS.
9. BEAM CONNECTIONS SHALL PROVIDE CONNECTION CAPACITY BY ALLOWABLE STRESS DESIGN (ASD) METHODS. WHERE BEAM REACTIONS ARE NOT INDICATED ON THE PLANS, CONNECTION CAPACITY SHALL BE DETERMINED AS FOLLOWS:
   a. NON-COMPOSITE BEAMS: SUPPORT A REACTION "R" EQUAL TO 1/2 THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM FOR A GIVEN SHAPE, SPAN, AND GRADE OF STEEL PER "ALLOWABLE LOADS ON BEAMS" PART 2, A.I.S.C. "MANUAL OF STEEL CONSTRUCTION", 13TH EDITION.
   b. ADD TO "R" THE LOADS OR REACTIONS OF MEMBERS SUPPORTED BY THE BEAM NEAR SUPPORTS AND/OR THE VERTICAL COMPONENTS OF FORCE IN DIAGONAL BRACING MEMBERS FRAMING INTO THE BEAM.
10. A MINIMUM OF TWO (2) BOLTS SHALL BE UTILIZED AT CONNECTIONS.
11. PROVIDE STIFFENERS "FINISHED TO BEAR" UNDER LOAD CONCENTRATIONS ON SUPPORTING MEMBERS, AND WHERE SHOWN ON THE DRAWINGS.
12. THE CONTRACTOR SHALL FURNISH & INSTALL ALL PLATES, CLIP ANGLES, CONNECTION MATERIALS, ETC. AS REQUIRED FOR COMPLETION OF THE STRUCTURE, EVEN IF SUCH ITEMS ARE NOT SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS.

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1"=1'-0" 1 0 1 2

3/4"=1'-0" 1 0 1 2 3

1/4"=1'-0" 2 0 2 4 6 8 10



STATE OF NEW YORK — AMBER R. HECKATHORN — 56609 — LICENSED PROFESSIONAL ENGINEER

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

# TYPICAL SHEET PILE DETAILS, SECTIONS AND NOTES

IN CHARGE OF STEVE W. ANAGNOST

DESIGNED BY WOM CHECKED BY ARF

DRAWN BY MWH

FILE NO. 1118.45595.010

DATE NOVEMBER 2012

G-10

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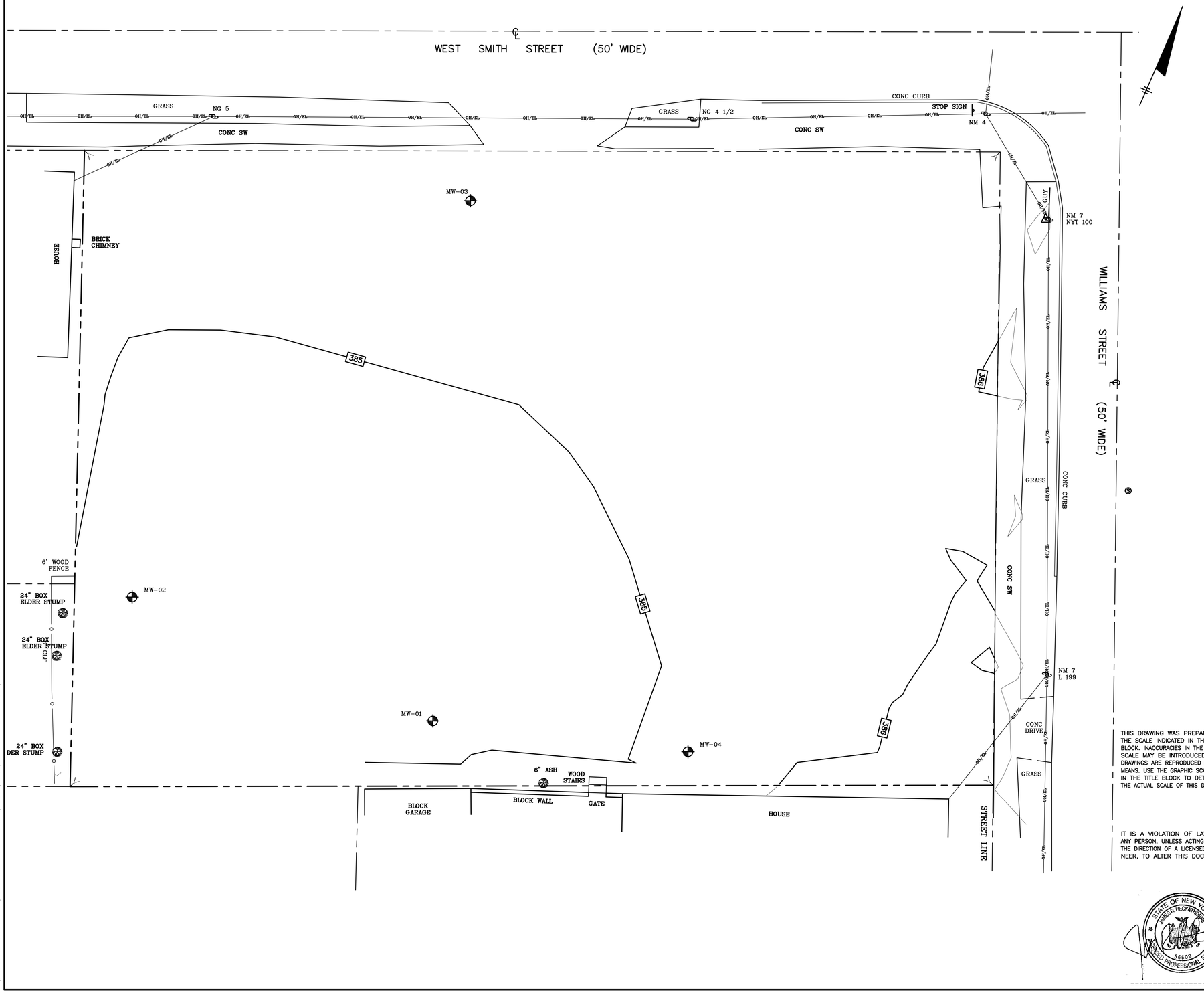


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O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

# FINAL SITE RESTORATION PLAN

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STATE OF NEW YORK JAMES R. HECKATHORNE 56609 LICENSED PROFESSIONAL ENGINEER

IN CHARGE OF STEVE W. ANAGNOST
DESIGNED BY MWH CHECKED BY ARF
DRAWN BY MWH

FILE NO. 1118.45595.011
DATE NOVEMBER 2012

G-11

PLAN

# Construction Quality Assurance Project Plan
# Former Herkimer MGP Site

nationalgrid

November 2, 2012

O'BRIEN & GERE

# TABLE OF CONTENTS



# LIST OF TABLES



# LIST OF FIGURES

# 1 INTRODUCTION

This document has been prepared as a means of providing guidelines and procedures for Construction Quality Assurance and Construction Quality Control (CQA/CQC) and Manufacturing Quality Assurance and Manufacturing Quality Control (MQA/MQC) during remedial construction for the former manufactured gas plant (MGP) site on East Smith Street in Herkimer, New York.

CQA means a planned system of activities that provides assurance that the facility was constructed as specified in the design. CQA refers to measures taken by the CQA organization to assess if the installer or contractor is in compliance with the plans and specifications and permits for the project. This may also include quality control for those actions taken before construction to evaluate if materials chosen and workmanship comply with agency approved engineering plans and specifications.

CQC means a planned system of inspections that are used to directly monitor and control the quality of a construction project. CQC includes those actions normally performed by the installer to achieve high quality in the constructed or installed system. CQC refers to measures taken by the installer or contractor to determine compliance with the requirements for materials and workmanship as stated in the plans and specifications for the project.

MQA is defined as a planned system of activities which provides assurance that materials were manufactured as specified in the contract documents. MQA includes manufacturing facility inspections, verifications, audits and evaluation of the quality of manufactured materials. MQA refers to measures taken by MQA organization to determine if the manufacturer is in compliance with the product certification and contract plans for a project.

MQC is defined as a planned system of inspections that is used to directly monitor and control the manufacture of a material that is factory originated. MQC is usually performed by the manufacturer of the materials and is necessary to ensure minimum (or maximum) specified values in the manufactured product. MQC refers to measures taken by the manufacturer to determine compliance with the requirements for materials and workmanship as stated in certification documents and contract documents.

This CQA/CQC Plan outlines the responsibilities of each of the entities associated with the project. This includes a delineation of the appropriate lines of communication between National Grid, Contractor, inspection personnel and design personnel associated with construction activities. Also provided is a description of the required level of experience and training for the Contractor and CQA/CQC inspectors in sufficient detail to determine that personnel permitted to be involved with the project have the necessary qualifications to properly complete the work in accordance with the methods and procedures specified. In addition to personnel requirements, a description of the CQA/CQC protocols to be utilized for documenting construction activities and compliance with the specifications is provided.

# 2 PROJECT ORGANIZATION AND RESPONSIBILITIES

An important facet of construction management is CQA/CQC and MQA/MQC during construction of the project. In this section, organizations involved in CQA/CQC and MQA/MQC for this project along with their responsibilities and qualifications are discussed. Lines of communication are presented, along with procedures for submission of CQA/CQC and MQA/MQC information.

## 2.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

Several organizations are involved in CQA/CQC and MQA/MQC prior to, during, and following construction. These include the following:

- New York State Department of Environmental Conservation (NYSDEC) as the regulatory agency
- National Grid
- O'Brien & Gere Engineers, Inc. as the Design Engineering Firm
- Engineer (to be determined) as the organization or individuals engaged by National Grid for the project to monitor that work is constructed in accordance with the approved plans and specifications
- Construction Contractor (Contractor) and Contractor's CQC Manager (to be determined)
- Testing laboratories (to be determined)
- Manufacturers and fabricators (to be determined)
- Installers (to be determined)

The responsibilities of these organizations are delineated in the following subsections.

***Regulatory agency responsibilities***. As the regulatory agency, the NYSDEC will perform the following functions:

- Review and approve original designs
- Review project submittals for compliance with regulations
- Issue approval to construct the project once an approved design has been submitted
- Review and approve major design modifications or requests for variances from the regulatory conditions during construction

***National Grid responsibilities***. National Grid will:

- Bear responsibility for the design, construction, construction inspection and operation of the project
- Comply with NYSDEC requirements to obtain approvals and/or permits
- Bear responsibility for all communications with the NYSDEC
- Bear responsibility for providing CQA/CQC and MQA/MQC documentation to the NYSDEC that construction activities associated with the project are proceeding in accordance with the approved design (and approved design modifications)
- Select organizations charged with design, CQA/CQC, MQA/MQC, and construction activities
- Accept or reject design plans and specifications, CQA/CQC plan, reports and recommendations of the design engineer, and the materials and workmanship of the Contractor
- Bear responsibility for providing the Construction Completion Report to the NYSDEC for review and acceptance

***Design engineer's responsibilities.*** As the Design Engineering Firm, O'Brien & Gere Engineers will perform the following:

- Provide a project design that fulfills the performance requirements of the NYSDEC
- Prepare this CQA/CQC Plan
- Prepare necessary design modifications during construction if necessitated by unexpected site conditions or required changes in construction methodology

***Engineer's responsibilities***. The Engineer will oversee the CQA/CQC and MQA/MQC activities required by this plan. The Engineer will perform the following:

- Review design plans and specifications
- Coordinate the review of the Contractor's shop drawing submittals
- Observe each construction activity
- Confirm the Contractor's CQC Plan is in accordance with the CQA/CQC Plan
- Accept methods employed by the Contractor to perform CQC testing services.
- Confirm that regular calibration of testing equipment is properly conducted and recorded
- Confirm that testing laboratories conform to CQA/MQA requirements and procedures and sample custody procedures are followed
- Confirm that testing equipment, personnel, and procedures do not change over time, or if changes are made, monitor that any changes do not adversely impact inspection processes
- Confirm that test data inspection reports are accurately recorded and maintained
- Provide National Grid with reports on testing and inspection results
- Notify the Contractor of deficiencies based on results of field inspections, CQA/CQC and/or MQA/MQC results
- Schedule and attend project CQA/CQC meetings during construction
- Provide daily on-site inspection of the work in progress to assess compliance with design plans and specifications
- Visually inspect materials brought to the Site for conformance with the specifications and for variations from material that was tested
- Observe field sampling and testing performed by the Contractor and review the results
- Observe whether materials are being properly handled and stored on-site
- Conduct day to day interaction with the Contractor
- Attend job meetings as required
- Certify that the facility was constructed in accordance with the plans and specifications approved by the regulatory agency
- Oversee the preparation of the Construction Completion Report and Record Drawings

***Construction contractor's responsibilities***. The general Contractor selected by National Grid will perform the following:

- Construct the project in accordance with the design plans and specifications using appropriate construction procedures and techniques
- Retain and oversee qualified subcontractors to perform specialized components of construction
- Develop a CQC implementation plan for CQC to assure compliance with the design plans, specifications and this CQA/CQC Plan
- Schedule and coordinate CQA/CQC and MQA/MQC inspection and testing activities
- Retain testing laboratories to provide CQC testing services
- Submit required reports, results, shop drawings, etc. to the Design Engineer for distribution for review and acceptance
- Prepare a construction activity schedule using the Critical Path Method (CPM) or a bar graph and update it monthly
- Provide the Engineer marked-up drawings for Record Drawing preparation

The Contractor has responsibility for CQC and providing daily reports to the Engineer. Other related duties include coordinating shop drawings submittals, providing required samples, and coordinating with the Engineer. The Contractor will be responsible for on-site inspection of work, performing tests to assess compliance with the contract documents, and reporting results of all tests and inspections to the Engineer.

***Testing laboratory responsibilities***. The testing laboratory utilized will meet the following requirements:

- Have an internal CQC plan in-place to confirm that laboratory procedures conform to the appropriate American Society for Testing and Materials (ASTM) standards or other applicable standards and methods
- Follow internal CQC procedures
- Maintain sample chain-of-custody records
- Report results of testing

The testing laboratory will be required to allow National Grid, the regulatory agency, the Design Engineer, the Installer, and the Engineer to observe sample preparation, testing procedures, or record-keeping procedures upon request. National Grid, the NYSDEC, the Design Engineer, the Installer and/or the Engineer will be allowed to observe some or all tests on a particular job at any time, either announced or unannounced.

***Manufacturer and fabricator responsibilities.*** The manufacturers and fabricators of geotextiles and other material required for construction of the project will:

- Certify that materials utilized, manufactured or fabricated meet the specifications
- Provide MQC steps taken during manufacturing or fabrication
- Allow National Grid, the regulatory agency, the Design Engineer, the Installer and the Engineer to observe the manufacturing and fabrication process and MQC procedures

The manufacturer or fabricator should have an MQC officer designated to be in charge of the MQC program. The MQC officer will be the individual to contact with questions regarding MQC and for arranging site visits to inspect MQC procedures and fabrication procedures. The MQC Officer will also be responsible for directing personnel in charge of MQC.

***Installer's responsibilities***. The Installer is the contractor or subcontractor that installs manufactured and fabricated products, such as sheet pile or geotextiles. The Installer's responsibilities include the following:

- Maintaining a CQC Plan in-place for handling, storing, placing, and installing materials
- Handling, storage, placement, and installation of manufactured and fabricated materials
- Following CQC procedures
- Informing the Engineer of the schedule for installation of manufactured or fabricated materials

## 2.2 PERSONNEL QUALIFICATIONS

To confirm that the project is constructed in accordance with the approved design plans and specifications, it is important that organizations and personnel involved in implementing the remedy possess suitable qualifications to perform the work. This includes personnel responsible for CQA/MQA as well as the Contractor. The following sections describe qualifications and minimum acceptable experience for positions identified in the CQA/CQC Plan.

***Engineer***. The Engineer will be required to be or work under the direction of a licensed professional engineer in the State of New York with demonstrated competency in similar projects. The Engineer will be responsible for observation of construction activities and will have a thorough familiarity with the project and testing requirements. The Engineer will also have experience in testing and inspection of earthwork, sheet pile installation, granular materials, geotextile fabrics, and site improvements.

***Contractor***. The general Contractor selected to construct this project will be required to present evidence of having experience in constructing projects of similar size and scope, including, but not limited to, projects requiring spudding and driving of sheet pile, construction water management including well pointing and other techniques, pre-treatment of MGP impacted construction water, protection of underground utilities, and material excavation and disposal.

***CQC geotechnical laboratory.*** The CQC Geotechnical Laboratory will be an independent laboratory approved by the Engineer. The CQC Geotechnical Laboratory will not be owned by the Contractor and/or subcontractors or owned by a subsidiary of the Contractor and/or his subcontractors.

The laboratory will be qualified to perform geotechnical testing presented in the specifications and have a minimum of five years experience in testing soil properties required for the project. The laboratory will be required to submit references from three other similar projects. National Grid will contact the references and accept or reject the laboratory based on its previous performance. All laboratory test results will be certified by a Laboratory Manager with a minimum of two years of soils testing experience.

***CQC analytical laboratory***. The CQC analytical laboratory will be an independent laboratory approved by the Engineer. The CQC analytical laboratory will not be owned by the Contractor and/or subcontractors or owned by a subsidiary of the Contractor and/or his subcontractors.

The CQC analytical laboratory will be qualified to perform the analytical testing presented in the specifications. The laboratory will be required to submit references from three other similar projects. National Grid will contact the references and accept or reject the laboratory based on its previous performance. All laboratory tests will be certified by a Laboratory Manager with a minimum of two years of testing experience.

***Installers.*** Installers of specified equipment and materials will be required to demonstrate experience in projects of similar size and nature as requested by the Engineer. Installers responsible specifically for the installation of steel sheet pile will be trained and qualified to install pile.

## 2.3 LINES OF COMMUNICATION

An important component to the successful completion of any project is effective communication between the parties involved. The lines of communication shown in Figure 1 will be followed on this project.

The Engineer will notify National Grid when deficiencies in the work are noted based on field inspections, CQA/CQC or MQA/MQC results. The Engineer will notify National Grid and, if appropriate, order corrective

measures or recommend work stoppage. Formal communications related to submittals and changes or modifications of work shall be made in accordance with the general and special provisions of the Contract Documents.

## 2.4 MEETINGS

To strengthen responsibility and authority, enhance communications, and maintain the progress of the work in an orderly and efficient manner, scheduled on-site construction and project management meetings will be held prior to and throughout the course of construction.

***Pre-construction meeting.*** After award of the contract, a pre-construction meeting will be held. Attendees at this meeting will include:

- Regulatory representative (NYSDEC)
- National Grid and/or National Grid's Representative
- Design Engineer (O'Brien & Gere Engineers)
- Engineer
- The Contractor and the Contractor's field supervisor

The meeting will cover contractual obligations, scheduling, and construction details. Important objectives of the meeting directly related to construction quality will be to:

- Provide each organization with all relevant CQA/CQC and MQA/MQC documents and supporting information
- Familiarize all entities with this CQA/CQC Plan and its role relative to the plans and specifications
- Determine any changes to the CQA/CQC Plan that are needed to monitor that the Project will be constructed to meet or exceed the specified design
- Review the responsibilities of each organization
- Review lines of authority and communication
- Discuss the established procedures or protocol for observations and tests including sampling strategies
- Discuss CQC/MQC proposed by Contractors and Installers
- Discuss established procedures or protocol for handling construction deficiencies, repairs, and retesting
- Review methods for documenting and reporting inspection data
- Review methods for distributing and storing documents and reports
- Review work area security and safety protocols
- Discuss procedures for the location, storage, and protection of construction materials and for the prevention of damage to the materials from inclement weather or other adverse events
- Conduct a site walk to review the project site layout, construction material and inspection equipment storage locations

Minutes of the pre-construction meeting will be kept by National Grid's Representative or Engineer and distributed to all attendees.

***Weekly construction meetings***. Construction meetings will be held weekly to discuss project progress and scheduling. Attendees at the meeting will include National Grid's Representative, Engineer, and Contractor. Representatives of the NYSDEC may also attend. Items of discussion will include:

- The progress of the work to date
- The schedule to accomplish upcoming work tasks
- Problems encountered or anticipated during construction

National Grid's Representative or Engineer will keep minutes of the weekly progress meetings and distribute the minutes to all attendees and others affected by decisions or actions from each meeting.

***Work deficiency meetings***. In the event that problems or recurring work deficiencies arise or are foreseen during construction, a special meeting will be held to define and resolve the problems or deficiencies. At a minimum, attendees at the meetings should include a representative of the Contractor with decision making authority, Owner's Representative, and the Engineer. It may also be necessary to have a representative of the Design Engineer attend. The meeting will be conducted in the following manner:

- Define the problem and discuss it among the attendees
- Propose and review alternate plans for solving the problem
- Implement the plan selected to resolve the problem or deficiency

Minutes of the meeting will be kept by National Grid's Representative or Engineer and distributed to all attendees.

# 3 CQA/CQC AND MQA/MQC

This CQA/CQC Plan will provide the basis for CQA/CQC and MQA/MQC activities associated with the remedial construction at the former MGP Site located on East Smith Street in Herkimer, New York. Detailed information, including the frequency of inspection, field testing methods, sampling requirements for laboratory testing, testing procedures and equipment to be used, criteria for acceptance/failure, and a description of the corrective actions to be initiated upon test failure are presented in the Technical Specifications, bound separately, and provided as part of the project's Contract Documents.

## 3.1 EXCAVATION SUPPORT SYSTEM

The excavation support system will consist of cantilevered steel sheet piling.

***Manufacturing quality control of raw materials by the manufacturer at the plant.*** The Contractor will be required to provide the following documentation from the steel manufacturer regarding quality control of raw materials used to manufacture the excavation support system.

- Certification that all steel used conforms or exceeds the requirements of ASTM A570, Grade 50 Structural Steel, Grade 50
- Quality control certificates of raw materials used to manufacture the components of the excavation support system

***Construction quality control.*** The Contractor will be required to review the Contract Documents for material and installation requirements of the steel sheet piling. Installation requirements for steel sheet piling are described in the Specification Section 02400.

Prior to ordering any materials, the Contractor shall review the Contract Documents and make all required submittals to the Engineer.

Submittals will typically include, but not be limited to, the following information:

- Construction Plan including a section to discuss the steel sheet piling alignment, installation and removal as required
- Excavation support system calculations signed and sealed by a Professional Engineer licensed to practice in the State of New York
- List and descriptions of sheet piling material, alignment, depth, driving and removal equipment and material
- Shop drawings including fabricated sections show complete dimensions and details of piling and the driving sequence, location and depth of piling. Shop drawings shall include details and dimensions of templates and other temporary guide structures for installing the piling. Shop drawings shall provide details of the method of handling piling to prevent deflection, distortion or damage to piling interlocks
- Interlock sealant and method for installation
- Material test certificates
- Sheet piling driving records
- Vibration Minimization and Monitoring Plan

The Contractor will be fully familiar with the material and installation requirements of steel sheet piling (with respect to the Contract Documents and the manufacturer's recommendations) and provide personnel to ensure that the correct material is handled and installed in the correct manner to provide a complete operating system in accordance with the separately bound Contract Documents and Contract Drawings.

The Contractor will be required to review the separately bound Contract Documents to determine the project survey and stakeout requirements for the installation of steel sheet piling at the vertical and horizontal location shown or specified.

***Construction quality assurance***. Prior to procurement of any material and during construction, the Engineer will review and verify submittals and sample information from the Contractor. The information will be reviewed to evaluate compliance with the Contract Documents. The Engineer will return the submittals to the Contractor, and depending on the review (acceptance or non-acceptance), the Contractor will proceed with ordering the materials.

The material delivered to the Site will be visually inspected by the Engineer to monitor that the submitted materials are used during construction. If changes in material occur prior to acceptance of the material by the Engineer, the material will be tested and evaluated with respect to the requirements of the Contract Documents. Any material not meeting the requirements will be removed from the site and replaced.

### 3.2 GEOTEXTILE FILTER FABRIC

***Construction quality control***. Prior to installation of the geotextile filter fabric, the Contractor will be required to provide documentation regarding quality control of physical properties of the geotextile filter fabric. The geotextile filter fabric will consist of a nonwoven, needle-punched geotextile. Samples of the production run of the geotextile material will be obtained and tested and the results certified in accordance with the following minimum average roll values:

**Table 1**
**MQC for Geotextile Filter Fabric Prior to Construction**

| Parameter | | Criteria |
|---|---|---|
| **Mass Per Unit Area** | ASTM D5261 | Minimum 12.0 oz/yd2 |
| **Permittivity** | ASTM D4491 | Minimum of 0.8 sec-1 |
| **Grab Tensile Strength** | ASTM D4632 | Minimum 300 lbs |
| **Grab Tensile Elongation** | ASTM D4632 | Minimum 50% |
| **Trapezoid Tear Strength** | ASTM D4533 | Minimum 115 lbs |
| **Puncture Strength** | ASTM D4833 | Minimum 175 lbs |
| **Mullen Burst Strength** | ASTM D3786 | Minimum 585 psi |
| **UV Resistance** | ASTM D4355 (after 500 hours) | 70% strength retained |
| **Apparent Opening Size** | ASTM D4751 | Maximum No. 100 U.S. |

**Source: O'Brien & Gere**

The Contractor will provide the Engineer with certified copies of the factory and laboratory test results prior to arrival of material on-site. In addition, the Contractor will provide the manufacturer's certification that the geotextile filter fabric meets the chemical, physical, and manufacturing requirements.

***Construction quality assurance***. Prior to procurement of any material and during construction, the Engineer will review and verify submittal and sample information from the Contractor. The information will be reviewed

to evaluate compliance with the Contract Documents. The Engineer will return the submittals to the Contractor, and depending on the review (acceptance or non-acceptance), the Contractor will proceed with ordering the materials. Upon delivery of the rolls of geotextile filter fabric, the Engineer will visually inspect the material.

During installation of the geotextile filter fabric, the Engineer will monitor that the geotextile filter fabric is installed in accordance with the requirements of the Contract Documents and as shown on the Contract Drawings.

During the installation phase, the geotextile filter fabric will be visually inspected for the following:

- Defects
- Rips
- Holes
- Flaws
- Deterioration
- Damage

Any imperfections, such as those noted above, will be immediately repaired by the Contractor and re-inspected.

### 3.3 IMPORTED FILL

The Contractor shall submit an affidavit from the owner of the source of each type of borrow material stating that to the best of their knowledge, the site of the source material was never used as a dump site for chemical, toxic, hazardous or radioactive materials and it is not now nor ever has been listed as a suspected depository for chemical, toxic, hazardous or radioactive materials by any Federal, State or governmental agency, department, or bureau.

The Contractor shall sample each different type of off-site material incorporated into the work at the location or locations identified by the Engineer. The Contractor shall perform analyses for Target Analyte List (TAL) volatile organic compounds (VOCs), TAL semi-volatile organic compounds (SVOCs), TAL metals, cyanide (total and amenable), and PCBs/Pesticides in accordance with NYSDEC guidance document DER-10, Table 5.4(e)10 for each source; unless the source is a NYSDOT-approved pit and the Engineer waives the requirement to conduct chemical analyses in accordance with DER-10. Laboratory data shall be submitted to the Engineer for review, on National Grid's behalf, immediately upon receipt and prior to use of the material on-site. The Engineer shall be the sole judge as to what constitutes each different type of material; however the definition of "different" shall include, but not necessarily limited to, variances in the physical properties of the same material, as well as the same material derived from separate borrow sources or separate areas in the same borrow pit. The analytical results will be compared to the unrestricted cleanup objectives set forth in 6 NYCRR Part 375. If the materials are found to be unacceptable by the Engineer, the Contractor shall remove and properly dispose of the materials in accordance with all applicable Federal, State and local laws and regulations at the Contractor's expense and liability.

# 4 DOCUMENTATION

This section describes the recordkeeping that will be used to document the CQA/CQC and MQA/MQC activities performed during construction of this project. The documentation will comprise the final records of the project, with the results of material and installation inspections and tests.

## 4.1 PROBLEM IDENTIFICATION AND CORRECTIVE MEASURE REPORTS

In the event that the Engineer determines that material or workmanship does not meet the requirements of the plans, specifications or CQA/CQC Plan or if an obvious defect in material or workmanship is noted, the Engineer will complete a problem identification and corrective measures report.

## 4.2 MEETING MINUTES

Documentation of all meetings described in Section 2.4 of this plan will be maintained by National Grid's Representative or Engineer in the form of written minutes or, for daily progress meetings, diary notes. Formal minutes of weekly meetings will be circulated to all meeting attendees, National Grid's Representative, the Engineer, the Contractor, and National Grid for review and comment.

## 4.3 PHOTOGRAPHS

All photographs taken by the Engineer will be recorded on a photo log which will include, at a minimum, the date, time, location, and description of the work.

## 4.4 RECORD DRAWINGS

At the completion of the project, all as-built information will be transferred to a reproducible set of final record drawings to document site conditions.

## 4.5 STORAGE AND DISPOSITION OF RECORDS

During construction of this project, the Engineer will be responsible for all facility CQA/CQC and MQA/MQC documents. This includes the Engineer's copy of the design criteria, Contract Documents and Drawings, the CQA/CQC Plan, and the originals of all the data sheets and reports. Duplicate records may be kept at other locations to avoid loss of this information if the originals are destroyed.

Once project construction is complete, the original documents will be stored in a manner that will allow for easy access while still protecting them from damage. All documentation will be maintained through the post-closure (30 years) monitoring period of the facility.

**PLACE HOLDER**

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PLAN

# Remedial Action Contingency Plan
# Former Manufactured Gas Plant
# East Smith Street
# Herkimer, New York

nationalgrid

November 2, 2012

O'BRIEN & GERE

1118 | 45595

# Remedial Action Contingency Plan
# Former Manufactured Gas Plant
# East Smith Street
# Herkimer, New York

Prepared for:

nationalgrid

JAMES R. HECKATHORNE, PE, VP
O'BRIEN & GERE ENGINEERS, INC.

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## 1. INTRODUCTION

This Remedial Action Contingency Plan (RACP) has been prepared to support implementation of the selected remedy for the former manufactured gas plant (MGP) site located on East Smith Street in Herkimer, New York, This plan describes the minimum requirements to be implemented by the Contractor to respond to site-related emergencies that could potentially occur during implementation of the remedy described in the Remedial Action Work Plan (RAWP) (O'Brien & Gere, October 2011) and Decision Document (NYSDEC, December 2011). The Contractor is required to augment this plan at no additional cost to National Grid as necessary to address the Contractor's approach to the work and requirements of the New York State Department of Environmental Conservation and other regulatory agencies.

The RAWP was prepared in accordance with the 2002 multi-site Voluntary Consent Order (VCO Index No. D0-0001-001) between Niagara Mohawk (now National Grid) and the New York State Department of Environmental Conservation (NYSDEC), and was approved by the NYSDEC on December 19, 2011. The Decision Document prepared by the NYSDEC accompanied the approval letter of December 19, 2011.

As described in the RAWP and the Decision Document, the selected remedy includes the following major components:

- Contaminated subsurface soils located within the Petroleum and Former Gas Holder Areas of the site will be excavated and disposed off-site at a permitted facility. To accomplish this, the former holder structure will be demolished and removed; all visible tar, oil and/or non-aqueous phase liquid (NAPL) encountered will be removed; and all soil containing greater than 500 mg/kg of total polynuclear aromatic hydrocarbons (PAHs) will be excavated. The excavation will extend to approximately 12 ft below ground surface (bgs) in the holder area and 16 ft bgs in the petroleum area, respectively.
- The excavations will be dewatered to permit soil removal and transport, unless otherwise approved by the NYSDEC. The contaminated groundwater removed from the excavations will be treated and sent off-site for disposal in a sanitary storm sewer or Publicly Owned Treatment Works (POTW).
- Soil and fill material that does not exceed the removal criteria, estimated to a depth of up to 6 ft bgs, overlying the contaminated soil will be excavated, stockpiled on-site, and evaluated for use in backfilling the deeper excavations.
- Placement of the suitable excavated and stockpiled on-site fill material back into the excavation
- Covering the excavations, and any on-site area with contaminants exceeding 6NYCRR Restricted Residential Use SCOs, with a minimum of 2 ft of clean fill from an off-site source
- Imposing an environmental easement, and implementing a Site Management Plan that will include an Institutional and Engineering Control Plan, a Monitoring Plan, and Operation and Maintenance Plan.

Wastes that will be generated as a result of implementing the remedy include:

- Miscellaneous surface and subsurface debris (e.g. brick, concrete, trees, stumps etc.)
- MGP-impacted soil excavated from within the limits of the for Gas Holder and Petroleum areas, as well as other contaminated areas, requiring disposal off-site at a NYSDEC licensed or permitted facility approved by National Grid
- Non-aqueous phase liquid (NAPL) or coal tar collected during excavation and material staging activities
- Construction water including groundwater or surface water entering the excavations; surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris; water or other liquids drained from or which have come into contact with potentially contaminated waste, soils or debris; and equipment decontamination liquid

- Materials resulting from the operation of the construction water treatment system and other Site activities (*e.g.*, NAPL, solids, spent filtration media, spent treatment media, geotextiles, used disposable equipment, personal protective equipment [PPE], sampling equipment, etc.)
- Materials resulting from the removal of temporary access pads

Prior to the start of site operations, the Contractor will be required to attend necessary meetings with local officials and/or those responsible for local emergency management and public safety (to include fire, police, hazardous material response teams, hospitals and local health officials) for purposes of coordinating the RACP with any emergency response efforts that would be performed by such agencies.

## 2. EMERGENCY RESPONSE PROCEDURES

This Section details the minimum actions to be taken by the Contractor in the event of site emergencies. The Contractor shall designate an emergency coordinator (typically the Contractor's Site Superintendent or designee) and provide National Grid with the phone numbers of at least three responsible persons, to be used during non-working hours and weekends when necessary, who shall be in a position to dispatch personnel and equipment to the project site in the event of an emergency. The Contractor shall also provide:

- A list of emergency equipment
- Site evacuation plans
- Procedures for evacuation of personnel from the site.
- Procedures and routes for emergency vehicular ingress/egress

In the event of a site emergency, the Contractor or designee will call 911. When necessary, the Contractor will coordinate the arrival of on-site emergency personnel and will briefly explain the nature of the emergency and site conditions as follows:

- Indicate his/her name
- Location of emergency (site address, support zone or exclusion zone)
- Description of emergency conditions that may require special rescue equipment, such as confined spaces; excavations, and elevated work platforms
- Potential chemical hazards and recommended PPE
- Emergency decontamination procedures

The Contractor shall not leave site vehicles or equipment on access roads and emergency exits such that emergency response vehicles or personnel may be obstructed. Also, the Contractor will designate a muster point in event of an emergency that requires evacuation of the work area, and will account for all personnel during an emergency.

The following emergency numbers will be posted on site.

| EMERGENCY NUMBER<br>Fire, Explosion, Emergency Medical, and Spills that may reach surface waters or public conveyances | |
|---|---|
| **Site Address** | **Phone Number** |
| **Smith Street<br>Herkimer, NY** | 911 |

| NOTIFICATIONS and CONTACT INFORMATION<br>Fire, Explosion, Emergency Medical, OSHA-Recordable Injuries, Petroleum Spills | | |
|---|---|---|
| **NATIONALGRID** | | |
| **Project Manager** | Steven P. Stucker | **Phone:** 315-428-5652 |
| **O'BRIEN & GERE** | | |
| **Project Officer** | James R. Heckathorne, PE | **Office:** 315-956-6277<br>**Cell:** 315-200-5209 |
| **Project Manager** | Steven W. Anagnost, PE | **Office:** 315-956-6259<br>**Cell:** 315-480-0094 |
| **Resident Engineer** | TBD | **Office:**<br>**Cell:** |
| **MUNICIPAL (non-emergency)** | | |
| **Police** | Herkimer | (315) 866-4330 |
| **Fire Department** | Herkimer | (315) 866-2242 |
| **Hospital** | St. Luke's – Memorial Hospital Center, Utica, NY | (315) 624-5170 |
| **STATE AND FEDERAL (non-emergency)** | | |
| **NYSDOH** | Scarlett E. Messier | (518) 402-7860 |
| **NYSDEC** | Bernard Franklin | (518) 402-9662<br>(Env Remediation)<br>800-457-7362 (Spill Hotline) |
| **National Response Center (NRC) for Oil/Chemical Spills** | | 800-424-8802 |
| **OSHA** | Syracuse Area Office<br>3300 Vickery Road<br>North Syracuse, NY | 315-451-0808 |

Any emergency or accident will be reported to the Engineer and National Grid's Representative. The Engineer and National Grid will review all emergency or accident reports and may further investigate any such report if necessary. An Incident Investigation must be completed for all injuries, illnesses, spills, fire, explosion, or property damage greater than $1,000. The absence of an injury does not preclude the need to complete an Accident Investigation Report as such incidents will be classified as "near miss" or "other." The Report will include, but is not limited to, the nature of the problem, time, location, and corrective actions taken to prevent recurrence. This report must be completed and sent to the O'Brien Engineer and National Grid's Representative within 24 hours. If all the "facts" cannot be determined in that period of time, then draft report will be submitted and a final report will be submitted immediately upon completing the investigation.

## 3. SPILL RESPONSE PLAN (SRP)

This section outlines requirements that, at minimum, shall be implemented by the Contractor in the event of spills that might occur on-site during remedial construction activities. The Contractor prepared work plans will describe the methods, means, 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.

Site personnel should expect and be properly trained and equipped to handle small spills since the project may involve handling drums which may leak or rupture (*e.g*. drums containing NAPL or construction water treatment chemicals). Overpacks and spill sorbents will be staged in a readily visible location to support drum handling emergencies. The minimum size spill kit should have the capacity to cleanup and containerize spills of 55 gallons. In addition to drums, other potential spills include leaking gasoline, diesel, antifreeze, hydraulic fluid, or oil from heavy equipment. If a spill of any type should occur, the Contractor should report the spill immediately to the Engineer or Owner representative and implement procedures in the Spill Response Plan.

Site personnel will generally respond to spills as follows:

- Stop the leak immediately if it can be done without directly contacting the leaking material. This may consist of turning heavy equipment off to remove pressure on various fluid systems.
- Remove or stop all ignition sources (hot work, generators, etc.) that are within 25' of any part of the spill.
- On-site personnel should immediately secure the area to prevent unauthorized entry into the spill area.
- Although not likely given the anticipated types of spills, the Contractor should initiate the *General Emergency Response Plan* in the HASP if a spill may cause an explosion, death, or serious injury.
- Site personnel may only respond to incipient stage fires regardless if such fires are associated with a spill.
- Confined Space Issue – If the leak occurs in an excavation where natural ventilation is limited, air monitoring will be required prior to entering the spill area. This is primarily an issue for fuel (gasoline, diesel, and kerosene) spills. The Contractor will determine if a fuel spill requires air monitoring.

PPE for Spills ≤55 gallons in open areas will generally consist of Modified Level D PPE (poly-coat Tyvek, nitrile gloves, and boot covers or boot decontamination). Over-boots or boot covers may also be used if persons cleaning the spill would have to walk on spilled materials. Latex gloves are not acceptable and will degrade with exposure to petroleum products. Spills into confined spaces will require PPE and other safety procedures specified on Confined Space Entry Permit.

Contaminated media and PPE used to contain a spill will be properly disposed of in accordance with the Waste Management Plan and appropriate New York State Regulations.

Decontamination shall be conducted in accordance with 29 CFR 1910.120 (k) and shall minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances as well as

minimize off-site transport of contamination. The Contractor shall clean roadways as necessary to prevent contamination being transported from the work areas into other parts of the Site or off-site by construction or plant traffic.

PLAN

# Community Environmental Protection Plan
# Former Herkimer MGP Site

nationalgrid

November 2, 2012

O'BRIEN & GERE

1118 | 45595

# Community Environmental Protection Plan – Former Herkimer MGP Site

Prepared for:

nationalgrid

JAMES R. HECKATHORNE, P.E. VP
O'Brien & Gere Engineers, Inc.

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## LIST OF FIGURES



## LIST OF APPENDICES

## 1 INTRODUCTION

This Community Environmental Protection Plan (CEPP) has been prepared to support implementation of the remedy selected for the former manufactured gas plant (MGP) site located on East Smith Street in Herkimer, New York, as described in the Remedial Action Work Plan (RAWP) (O'Brien & Gere, October 2011) and Decision Document (NYSDEC, December 2011). The RAWP was prepared in accordance with the 2002 multi-site Voluntary Consent Order (VCO Index No. D0-0001-001) between Niagara Mohawk (now National Grid) and the New York State Department of Environmental Conservation (NYSDEC), and was approved by the NYSDEC on December 19, 2011. The Decision Document prepared by the NYSDEC accompanied the approval letter of December 19, 2011.

The former MGP site occupies approximately 0.4 acres of an approximately 0.585 acre parcel in a residential neighborhood (Figure 1). The site is bordered to the north by East Smith Street, to the east by Williams Street and to the west and south by residential properties. The surrounding neighborhood includes residential and commercial properties. The area is served by public water and sewer systems.

Surficial structures related to the former MGP are no longer present on-site, but remnants of concrete pads and a sidewalk are visible on the surface in the center of the parcel (Figure 2). In addition, pre-design investigations identified that an octagonal holder, including the conical base, is present on the west side of the site. The pre-design investigations also identified a Petroleum Area where remedial actions are required.

As described in the RAWP and the Decision Document, the selected remedy includes the following major components:

- Contaminated subsurface soils located within the Petroleum and Former Gas Holder Areas of the site will be excavated and disposed off-site at a permitted facility. To accomplish this, the former holder structure will be demolished and removed; all visible tar, oil and/or non-aqueous phase liquid (NAPL) encountered will be removed; and all soil containing greater than 500 mg/kg of total polynuclear aromatic hydrocarbons (PAHs) will be excavated. The excavation will extend to approximately 12 ft below ground surface (bgs) in the holder area and 16 ft bgs in the petroleum area, respectively.
- The excavations will be dewatered to permit soil removal and transport, unless otherwise approved by the NYSDEC. The contaminated groundwater removed from the excavations will be treated and sent off-site for disposal in a sanitary storm sewer or Publicly Owned Treatment Works (POTW).
- Soil and fill material that does not exceed the removal criteria, estimated to a depth of up to 6 ft bgs, overlying the contaminated soil will be excavated, stockpiled on-site, and evaluated for use in backfilling the deeper excavations.
- Placement of the suitable excavated and stockpiled on-site fill material back into the excavation
- Covering the excavations, and any on-site area with contaminants exceeding 6NYCRR Restricted Residential Use SCOs, with a minimum of 2 ft of clean fill from an off-site source
- Imposing an environmental easement, and implementing a Site Management Plan that will include an Institutional and Engineering Control Plan, a Monitoring Plan, and Operation and Maintenance Plan.

The CEPP consists of five parts, as follows, that describe the minimum requirements to be implemented by the Contractor:

- Hours of Operation and Site Security
- Community Air Monitoring Plan
- Vapor/Odor Management Plan

- Traffic Control Plan
- Noise and Vibration Mitigation

Also, included as Appendices to the CEPP are a Waste Management Plan (Appendix A) and Erosion and Sediment Control Plan (Appendix B),

Each of the plans listed above is presented in the following sections. The Contractor is required to augment each plan as necessary to address the Contractor's approach to the work and requirements of the NYSDEC and other regulatory agencies

## 2 HOURS OF OPERATION AND SITE SECURITY

Due to potential nuisance conditions including noise, traffic, and dust, the Contractor will be allowed to work on site only between 7:00 AM and 7:00 PM local time Monday through Friday, excluding holidays. No work will be performed on site during the evening or overnight hours (7:00 PM to 7:00 AM), weekends, or holidays unless necessary to care for and protect the work (*e.g*. operation and maintenance of the construction water management system).

To discourage and prevent trespassing onto the site, the Contractor will erect and maintain a chain link perimeter fence for the duration of work. The fence will be locked during non-working hours and whenever there are not personnel on site from the Contractor, National Grid or its representatives. Visitors to the site will be allowed only if having business on site in connection with the remedial action being implemented in accordance with the RAWP. Other authorized individuals include representatives of National Grid, National Grid's Representative, Engineer, and NYSDEC. Individuals may enter the exclusion zones on site only if trained in accordance with Occupational Safety and Health Administration (OSHA) requirements for hazardous waste operations, or if escorted by an individual having such training.

Others having an interest to visit the site must first receive approval to do so from National Grid and must be accompanied by the Engineer or the National Grid designee while on site. These individuals will not be allowed to enter the exclusion zones on site regardless of training.

## 3 COMMUNITY AIR MONITORING PLAN

Community air monitoring shall be performed at the Site in accordance with the New York State Department of Health Generic Community Air Monitoring Plan, and Fugitive Dust and Particulate Monitoring Plan. Both plans are provided in Appendix C for reference.

The community air monitoring program will include sampling and analyses for particulates (PM-10) and volatile organic compounds (VOCs) using sample equipment staged upwind and downwind of the work area while intrusive construction tasks are being conducted by the Contractor. A total of four community air monitoring stations, each containing monitors for PM-10 and VOCs, will be established around the perimeter of the site as needed. The samplers will run continuously with datalogging during ground intrusive activities.

Actions to control the generation or release of site contaminants will be required if the difference between the downwind and upwind/background concentrations exceed the following action levels:

- 5 ppm for VOCs
- 100 µg/$m^3$ for PM-10 for a 15-minute average

The sections below describe response actions in the event that the action levels above are exceeded.

### 3.1 VAPOR EMISSION RESPONSE

VOC levels exceeding 5 ppm above background at the perimeter of the work area will require that work activities be halted by the Contractor, and actions initiated by them to reduce the VOC emissions from the work

area. At that time, air monitoring shall be implemented by the independent third-party firm hired by National Grid to measure the vapor emission levels in the work zone and at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure. If VOC levels in the work zone or downwind location are below or decrease to below 5 ppm over background, work activities can resume with continued monitoring.

However, if the VOC level at the perimeter of the work area is above 25 ppm, activities must be shut down and actions taken by the Contractor to reduce VOC levels at the perimeter of the work zone to below 5 ppm above background.

If efforts to abate the emission source do not lower the VOC levels below 5 ppm above background at the downwind sampling location, or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), then the work will be suspended until corrective measures can be implemented by the Contractor. If necessary, during this period the source of the vapor may be covered to mitigate the condition.

### 3.2 PARTICULATE EMISSION RESPONSE

Actions shall be initiated by the Contractor to reduce the particulate emissions from the work area whenever the particulate levels exceed 100 µg/m$^3$ above the upwind particulate level (*e.g*. background) at the perimeter of the work area.

Particulate levels exceeding 150 µg/m$^3$ above the upwind particulate level at the perimeter of the work area will require that work activities be halted by the Contractor. At that time, air monitoring shall be implemented to measure the particulate emission levels in the work zone, and at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure. If particulate levels in the work zone or downwind location are below or decrease to below 150 µg/m$^3$ over background, work activities can resume with continued monitoring.

If efforts to abate the emission source do not lower the particulate levels below 150 µg/m$^3$ 200 feet downwind of the work area, or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), then the work will be suspended until corrective measures can be implemented by the Contractor. If necessary, during this period the source of the dust may be covered to mitigate the condition.

## 4 VAPOR/ODOR MANAGEMENT PLAN

The Contractor will be required to implement provisions to control odor emanating from excavations and stockpiles of soil and material excavated from the Site. Primary measures will be implemented to minimize generation of odor by minimizing, to extent practicable, exposed surface of waste material and contaminated soil.

At a minimum, the Contractor will be required to provide two Rusmar PFU400/25 Pneumatic Foam Units, each with a dedicated operator for the duration of excavation and loading activities. One unit will be operated at the excavation location and one will be operated at the stockpile/material loading location. A minimum of 16 drums of Rusmar AC-645 Long Duration foam will be provided prior to the start of excavation. Additional drums of Rusmar AC-645 Long Duration foam will be provided as necessary.

Additional measures may include use of other products, approved by Engineer, to mask objectionable odors.

The following additional dust and odor control measures may be used, depending upon specific circumstances, field observations, and air monitoring results:

- Other odor suppression foams
- Piian Flexi-fog system, or equivalent

- Bio-Solve
- Water Spray
- Polyethylene sheeting (for covering excavation faces, material stockpiles, etc.)

## 5 TRAFFIC CONTROL PLAN

The former MGP Site is located in the Village of Herkimer and is bordered to the north by East Smith Street, to the east by Williams Street and to the west and south by residential properties. The surrounding neighborhood includes residential and commercial properties.

Implementation of the remedy will require truck traffic, significant at times, to transport:

- Heavy equipment and steel sheet pile
- Wastes including construction and demolition (C&D) debris and non-hazardous waste (e.g. MGP-impacted soil) to a NYSDEC-licensed or permitted off-site disposal facility approved by National Grid.
- Select fill, common fill, and topsoil from National Grid-approved off-site sources for use in backfilling the excavations and restoring the surfaces.
- Asphalt for paving the site (optional based on direction from National Grid)

To prevent the release of wastes from the wheels or undercarriage of vehicles, the Contractor will be required to construct a stabilized construction entrance to the site and construct a vehicle/equipment decontamination pad. All vehicles and equipment entering the site exclusion zone will require inspection and decontamination prior to leaving the site. Decontamination will consist of dry brushing or pressure washing (if necessary) the wheels and undercarriage of the vehicles.

Trucks used for transportation of material for off-site disposal will be water-tight and equipped with solid covers (*e.g*. tightly woven fabric, no mesh covers). Trucks carrying waste material are not permitted to leave the site without the waste being covered.

Trucks and operators will be permitted or licensed as required by federal and state laws and regulations for the waste material type being disposed. All shipments will be accompanied by appropriate papers including either a Bill of Lading or Hazardous Waste Manifest (as applicable), and the vehicles placarded as applicable for the waste type. No waste is allowed to leave the site without the waste material first being characterized by the Contractor, accepted by an appropriate disposal facility licensed or permitted by the NYSDEC to receive the waste, and completed and signed documentation in accordance with applicable laws and regulations.

To minimize disruption to the local community, the route shown on Figure 3 will be utilized for trucks to or from the site. If necessary, the Contractor may request an alternate route but must receive an approval in writing from the Engineer after coordination with local authorities.

## 6 NOISE AND VIBRATION MONITORING

The Contractor shall take adequate measures to keep noise levels produced by construction equipment to safe and tolerable limits as set forth by the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA) and the New York State industrial Code Guidelines and Ordinances. All construction equipment presenting a potential noise nuisance shall be provided with noise muffling devices.

Also, the Contractor shall conduct a structural survey of houses adjacent to the areas where excavation will occur (provided that access to the property is granted by the owner). The structural survey shall include a visual inspection of the exterior of the residential foundations along with photographic documentation of the exterior condition of the residences prior to construction. The Contractor shall develop a Vibration

Minimization and Monitoring Plan to be implemented during the installation and removal of sheet pile, if sheet piling is being installed to facilitate excavation. During any sheet pile installation and removal activities, the Contractor shall monitor and maintain the peak particle velocity to less than 0.5 inches/sec at any structure in the vicinity of sheet pile installation. If the peak particle velocity exceeds 0.5 inches/sec, the Contractor will be required to stop sheet pile installation activities and propose alternate pile installation procedures and equipment to reduce the vibrations.

## REFERENCES

NYSDEC, 2011. Decision Document, NM-Herkimer Smith St. MGP Voluntary Cleanup Program Herkimer, Herkimer County, Site Number V00471, December 19. 2011.

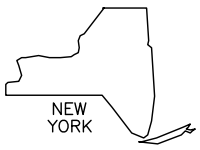
O'Brien & Gere. 2011. Remedial Action Work Plan. October 19, 2011.

FIGURE 1


ADAPTED FROM: USGS 7.5 QUADS. SERIES LITTLE FALLS, NY, 1943

NATIONAL GRID
FORMER MGP SITE
HERKIMER, NEW YORK

## SITE LOCATION MAP




QUADRANGLE LOCATION

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

FILE NO. 1118.45595.010
MARCH 2012

SCALE: 1:24000

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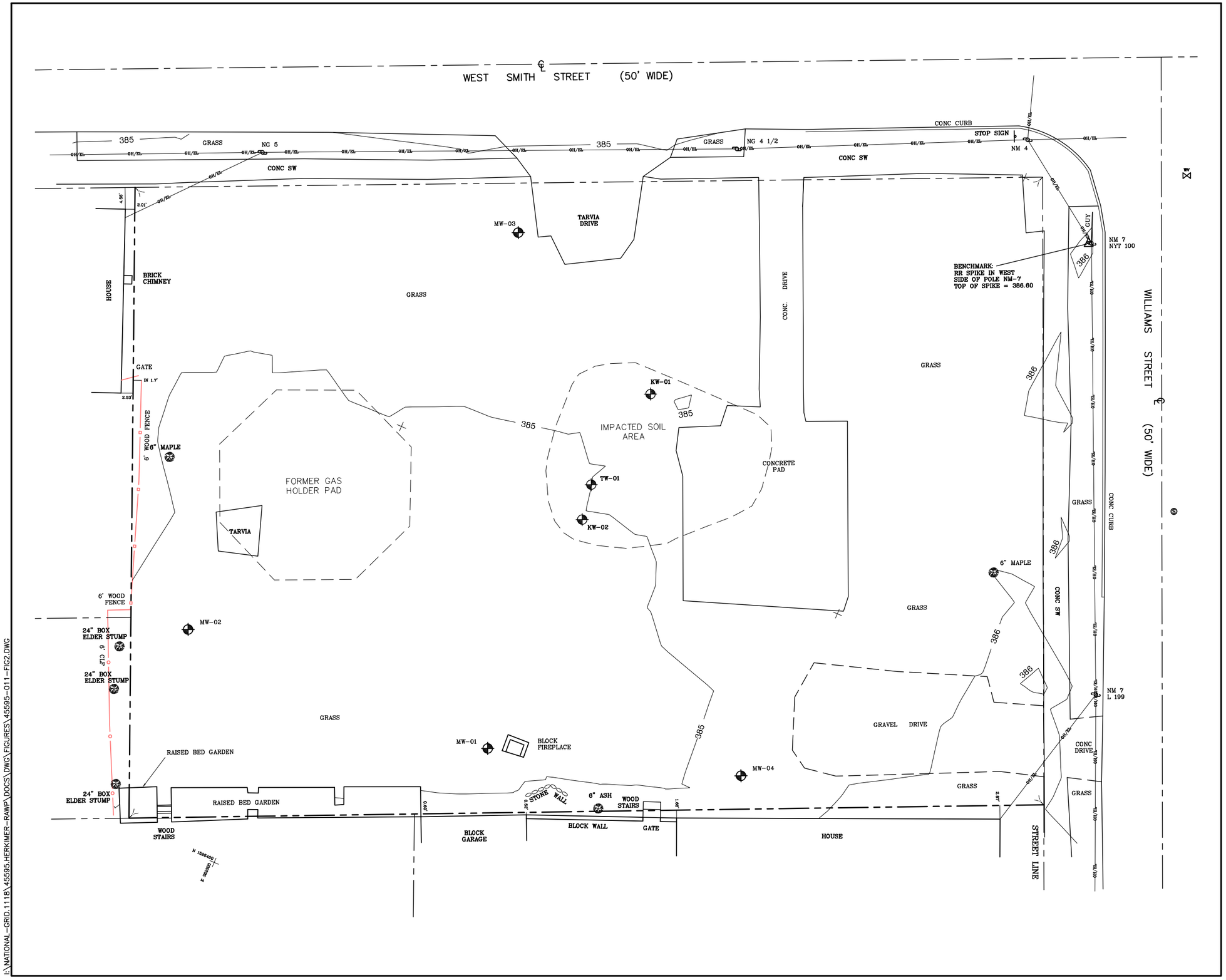
FIGURE 2




# NATIONAL GRID
# FORMER MGP SITE
# HERKIMER, NEW YORK

## SITE PLAN

1"=20' (20 0 20)

FILE NO. 1118.45595.011
MARCH 2012

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I:\NATIONAL_GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\FIGURES\45595-011-FIG2.DWG

**PLACE HOLDER**

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# *Waste Management Plan*

PLAN

# Waste Management Plan
# Former Manufactured Gas Plant
# East Smith Street
# Herkimer, New York

nationalgrid

November 2, 2012

O'BRIEN & GERE

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## LIST OF FIGURES



## LIST OF EXHIBITS

## 1 INTRODUCTION

This Waste Management Plan (WMP) has been prepared to support implementation of the selected remedy for the former manufactured gas plant (MGP) site located on East Smith Street in Herkimer, New York, as described in the Remedial Action Work Plan (RAWP) (O'Brien & Gere, October 2011) and Decision Document (NYSDEC, December 2011). The RAWP was prepared in accordance with the 2002 multi-site Voluntary Consent Order (VCO Index No. D0-0001-001) between Niagara Mohawk (now National Grid) and the New York State Department of Environmental Conservation (NYSDEC), and was approved by the NYSDEC on December 19, 2011. The Decision Document prepared by the NYSDEC accompanied the approval letter of December 19, 2011.

The former MGP site occupies approximately 0.4 acres of an approximately 0.585 acre parcel in a residential neighborhood (Figure 1). The site is bordered to the north by East Smith Street, to the east by Williams Street and to the west and south by residential properties. The surrounding neighborhood includes residential and commercial properties. The area is served by public water and sewer systems.

Surficial structures related to the former MGP are no longer present on-site, but remnants of concrete pads and a sidewalk are visible on the surface in the center of the parcel (Figure 2). In addition, pre-design investigations identified that an octagonal holder, including the conical base, is present on the west side of the site. The pre-design investigations also identified a Petroleum Area where remedial actions are required.

As described in the RAWP and the Decision Document, the selected remedy includes the following major components:

- Contaminated subsurface soils located within the Petroleum and Former Gas Holder Areas of the site will be excavated and disposed off-site at a permitted facility. To accomplish this, the former holder structure will be demolished and removed; all visible tar, oil and/or non-aqueous phase liquid (NAPL) encountered will be removed; and all soil containing greater than 500 mg/kg of total polynuclear aromatic hydrocarbons (PAHs) will be excavated. The excavation will extend to approximately 12 ft below ground surface (bgs) in the holder area and 16 ft bgs in the petroleum area, respectively.
- The excavations will be dewatered to permit soil removal and transport, unless otherwise approved by the NYSDEC. The contaminated groundwater removed from the excavations will be treated and sent off-site for disposal in a sanitary storm sewer or Publicly Owned Treatment Works (POTW).
- Soil and fill material that does not exceed the removal criteria, estimated to a depth of up to 6 ft bgs, overlying the contaminated soil will be excavated, stockpiled on-site, and evaluated for use in backfilling the deeper excavations.
- Placement of the suitable excavated and stockpiled on-site fill material back into the excavation
- Covering the excavations, and any on-site area with contaminants exceeding 6NYCRR Restricted Residential Use SCOs, with a minimum of 2 ft of clean fill from an off-site source
- Imposing an environmental easement, and implementing a Site Management Plan that will include an Institutional and Engineering Control Plan, a Monitoring Plan, and Operation and Maintenance Plan.

Wastes that will be generated as a result of implementing the remedy include:

- Miscellaneous surface and subsurface debris (e.g. brick, concrete, trees, stumps etc.)
- MGP-impacted soil excavated from within the limits of the for Gas Holder and Petroleum areas, as well as other contaminated areas, requiring disposal off-site at a NYSDEC licensed or permitted facility approved by National Grid
- Non-aqueous phase liquid (NAPL) or coal tar collected during excavation and material staging activities

- Construction water including groundwater or surface water entering the excavations; surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris; water or other liquids drained from or which have come into contact with potentially contaminated waste, soils or debris; and equipment decontamination liquid
- Materials resulting from the operation of the construction water treatment system and other Site activities (*e.g.*, NAPL, solids, spent filtration media, spent treatment media, geotextiles, used disposable equipment, personal protective equipment [PPE], sampling equipment, etc.)
- Materials resulting from the removal of temporary access pads

This WMP describes the minimum requirements to be implemented by the Contractor to characterize, handle, treat, and dispose the various waste materials likely to be generated.

## 1.1 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

Waste management activities shall be conducted in accordance with the following federal, state, and local regulations and procedures, and others that may be applicable:

- United States Environmental Protection Agency (USEPA), including Title 40, Code of Federal Regulations (CFR) Parts 1-1700 regarding protection of the environment.
- State of New York Rules and Regulations, including Title 6 of the Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Parts 360, 364, 370-374, and 376 regarding treatment/disposal, transportation, and management of hazardous and non-hazardous wastes.
- New York State Department of Environmental Conservation (NYSDEC) DER 4 – Management of Coal Tar Wastes and Coal Tar Contaminated Soil and Sediment from Former Manufactured Gas Plants.
- Transportation regulations, including U.S. Department of Transportation (USDOT) regulations, including Title 29 Parts 171 and 172 and New York State Department of Transportation (NYSDOT) rules and regulations.
- National Grid USA Waste management and recycling procedures for conducting work at company facilities (Exhibit 1).

Whenever there is a conflict or overlap of the above-referenced documents, the more stringent provision shall be applicable.

## 1.2 CONTRACTOR SUBMITTALS REQUIRED

The Contractor shall prepare a supplement to this WMP providing a description of the proposed sequence and methods for waste excavation, on-site placement, or off-site disposal. The Contractor's supplement to the WMP shall include:

- Methods and frequency for determining waste disposal requirements
- Name and location of laboratory(ies) to conduct the analyses
- Name and location of the off-site facility(ies) to which the waste is to be shipped
- Expected schedule for the shipment of waste material
- Method of transportation
- Names of licensed waste haulers
- Procedures for manifest management

During the work, the Contractor shall provide National Grid and the Resident Engineer copies of:

- Completed waste characterization profiles

- Acceptance letters or approvals received from waste disposal facilities
- Truck permits and operator licenses
- Laboratory reports
- Documentation of the type and quantity of waste shipped to each facility

# 2 MATERIAL HANDLING AND TREATMENT/DISPOSAL

## 2.1 SITE CLEARING AND DEMOLITION DEBRIS

Debris generated during the remedial activities is anticipated to include the remnants of historical MGP structures and utilities. Such materials will be segregated as appropriate from other excavated materials, downsized (as appropriate), and handled separately, where practicable.

Debris including asphalt pavement, concrete slabs and foundations, and abandoned subsurface utilities will be removed and stockpiled within a material staging area designated by the Contractor prior to off-site disposal. The Contractor will indicate the number of samples and analyses (if any) required by the National Grid-approved off-site disposal facility and characterize the debris. The Contractor will profile, downsize (as required by the waste transportation and disposition vendors), containerize (*i.e.*, completely line and cover waste hauling vehicles), label, and transport the debris to the off-site disposal facility based on the waste characterization in accordance with applicable rules and regulations.

The Contractor shall mobilize debris crushing/downsizing equipment, as may be required, prior to initiating excavation activities to minimize potential work delays once/if materials requiring downsizing are encountered. National Grid will review and approve waste profiles and draft shipping papers prior to off-site disposition of materials and will sign all waste manifests/bills of lading.

Debris will be transported in accordance with applicable Federal and State regulations to a National Grid-approved construction and demolition (C&D) landfill or other appropriate landfill based on the waste characterization.

## 2.2 EXCAVATED SOIL

Soil excavated from the Site will be stockpiled in accordance with the Contract Drawings and Technical Specifications, as described in the RAWP, for subsequent reuse on site or transportation to an off-site treatment/disposal facility on National Grid's approved waste transportation and disposition vendor list (Exhibit 2).

While on-site, stockpiles of soil exhibiting MGP-impact shall remain covered unless material is being actively added to or removed from the pile. Dust and odor control measures shall be implemented by the Contractor in accordance with the Community Environmental Protection Plan (CEPP) and depending upon specific circumstances, field observations, and air monitoring results, may include use of:

- Odor suppression foams
- Bio-Solve
- Water Spray
- Piian Odor Control system, or equivalent
- Polyethylene sheeting (for covering excavation faces, material stockpiles, etc.)
- Commercial grade fans

The Contractor shall have the selected odor control methods and materials available on-site. If the Contractor's method of controlling odor is inadequate, then the excavation will be discontinued by them until alternate measures can be implemented.

The Contractor shall be responsible for all dewatering activities associated with excavated soils prior to the reuse or transportation/disposal of such materials. The Contractor shall provide measures to dewater the material to achieve the moisture content requirement without augmentation of soil not otherwise requiring disposal off-site or use of drying agents (*e.g*. cement kiln dust). Utilization of drying agents and/or on-site soil not otherwise requiring off-site disposal might be allowed only if specifically permitted by the Engineer. At a minimum, excavated soils must pass Paint Filter testing procedures prior to the transportation of such materials to the approved off-site treatment/disposal facility.

Trucks used for transportation of material for off-site disposal will be water-tight and equipped with solid covers (*e.g*. tightly woven fabric, no mesh covers). Trucks carrying waste material are not permitted to leave the site without the waste being covered.

Soil to be disposed of off-site at a NYSDEC permitted or licensed treatment/disposal facility will be characterized by the Contractor. The Contractor shall complete and submit a waste profile to the approved treatment/disposal facility and appropriately label. placard, and transport the soils to the off-site treatment/disposal facility in accordance with applicable laws and regulations. The Contractor will be responsible for preparing waste profile and manifest forms. National Grid will review and approve waste profiles and draft manifests prior to off-site transportation and disposal of materials, and will sign waste manifests/bills of lading.

Based on the results of the waste characterization activities, the excavated soil may be treated/disposed of in a manner consistent with the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4061, *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants* (NYSDEC, 2002).

## 2.3 NAPL AND COAL TAR

NAPL collected during excavation, material dewatering, and/or water treatment activities will be placed in appropriate containers (*e.g*., 55-gallon drums) for off-site disposal. The NAPL-containing drums shall be stored on site in a dedicated staging area. Based on discussions with the National Grid-approved disposal facility, the Contractor shall indicate the number of required samples and analyses. The Contractor shall label, transport, and dispose of the collected and containerized NAPL based on the characterization results in accordance with applicable rules and regulations. The Contractor will be responsible for preparing all waste profiling and manifest forms. National Grid will review and approve waste profiles (prior to finalizing profiles with the facility) and draft manifests (prior to off-site disposition of materials), and will sign all waste manifests/bills of lading. NAPL will be transported to an appropriate National Grid-approved disposal facility.

## 2.4 CONSTRUCTION WATER

Construction water is anticipated to be generated from excavations. At minimum, the Contractor shall provide means to remove, treat, and properly dispose 300,000 gallons of groundwater from the excavation each day, including weekends and other non-work days, for the duration of Contract work. Pumps, pipe and treatment processes provided shall have capacity to remove water continuously to a rate of up to 200 gallons per minute, and shall be operated continuously to maintain a dry excavation. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week. Minimally, the CWTP shall include the following:

- A closed top influent or flow equalization tank (e.g. 42,000 gallons +/- Frac tanks) for receiving and temporarily holding construction water pending treatment by the Contractor.

- Bag filters for removing fine suspended solids
- Granular activated carbon filters for removal of volatile and semi-volatile organic compounds
- An effluent tank for receiving and temporarily holding treated water (e.g. 21,000 gallons +/- Frac tank)
- Effluent flow meter with totalizing meter

The Contractor shall design, construct, and operate a construction water treatment plant (CWTP) as necessary to comply with the discharge limits of the Discharge Requirements and Limits established by the Village of Herkimer Publically Owned Treatment Works (POTW) for discharge to the sanitary sewer, provided as Exhibit 3.

If the anticipated flow rate of up to 200 gpm is exceeded, or if the Village of Herkimer POTW cannot accept the construction water, then the excavations will be conducted in saturated (wet) conditions as described by the NYSDEC in a letter dated January 5, 2011 (NYSDEC, January 25, 2011). At the conclusion of excavation, a quantity of water equal to one volume of the remaining saturated depth (12 feet for the gas holder area and 16 feet for the Petroleum Area) will be removed and treated as necessary for discharge to the Village of Herkimer sanitary sewer.

## 2.5 MISCELLANEOUS WASTE

Miscellaneous wastes generated during the remedial activities may be classified as general refuse or remediation-related waste material. General refuse (that has not contacted any impacted materials) may be managed as a non-hazardous waste and disposed of at a National Grid-approved off-site non-hazardous solid waste disposal facility.

Remediation-related waste materials that are either in, or come in contact with, impacted site materials during the construction will be considered potentially impacted. These waste materials include, but are not limited to, the following:

- Ancillary wastes generated as a result of the remedial activities, including but not limited to materials used to construct the material staging, containment, and decontamination areas
- Spent water treatment system materials (*e.g.*, bag filters, granular activated carbon [GAC])
- Solid and liquid wastes (*e.g.*, sediments or sludge) generated from operation of the water treatment system
- Temporary erosion control devices (*e.g.*, silt fencing, straw bales, etc.)
- Scrap geotextile
- Used disposable equipment
- Used personal protection equipment (PPE)
- Used sampling equipment

The miscellaneous wastes shall be containerized and stored on site in a staging area by the Contractor. The Contractor shall determine if the miscellaneous waste can be transported/disposed under the existing waste profiles or if a new waste profile is required. If a new waste profile is required, the Contractor shall sample and analyze the material for purpose of completing a waste characterization profile as required by the National Grid-approved disposal facilities. Following characterization, the Contractor shall label, manifest (as appropriate), transport, and dispose of the collected and containerized miscellaneous waste in accordance with applicable laws and regulations.

National Grid will review and approve the waste profile(s) and draft manifest(s) prior to off-site disposition of materials, and will sign all waste manifests/bills of lading.

## 2.6 TEMPORARY DECONTAMINATION PAD

During the course of the remedial activities, the Contractor will be required to install temporary decontamination pads to facilitate the removal of soils and sediments from construction equipment utilized in the Remedial Design. As the Project progresses from one portion of the site to another, the temporary decontamination pads may be removed and reinstalled in different areas of the site. The decontamination pads will be relocated to accommodate daily site activities for the on-site operations. At the end of the Project, materials used in the construction of the temporary decontamination pads will be subject to off-site disposal. Water used for decontamination purposes will be handled as construction water.

## 2.7 OFF-SITE TRANSPORT AND TREATMENT/DISPOSAL

The Contractor shall undertake the following activities prior to off-site transport and treatment/disposal of the materials to comply with applicable federal, state, and local regulations:

- Confirm National Grid's United States Environmental Protection Agency (USEPA) Generator Identification Number for the site, which will allow the generation, transportation, and treatment/disposal of hazardous waste
- Select the NYSDEC-permitted and National Grid-approved transporters and treatment/disposal facilities
- Provide the selected treatment/disposal facilities with the required waste characterization results and waste profile forms as part of the waste acceptance procedure
- For solid wastes, the Contractor shall collect 1 composite sample for each 500 tons of waste and have the sample analyzed using the RCRA toxicity characteristic leaching procedure (TCLP) test methods for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. The Contractor shall also analyze the samples for ignitability and other parameters that the off-site disposal facility requires. If the off-site disposal facility approved by National Grid requires more frequent or additional analyses, then the more stringent requirement shall govern.
- Waste characterization sampling and analyses shall be performed for solid wastes destined for off-site treatment (if any). Samples shall be analyzed for total petroleum hydrocarbons (USEPA method 8015), VOCs (USEPA method 8260B), SVOCs (USEPA method 8270C), polychlorinated biphenyls (USEPA method 8082), metals (including As, Ba, Cd, Cr, Pb, Hg, Se, Ag, An, Be, Ni, Th, Va, Zn) (USEPA method 6010B), cyanide (USEPA method 9010), percent sulfur (USEPA method D129-64), and British Thermal Units (BTU) by ASTM D240-87. Frequency of sampling and analyses as follows:
  - 1st composite sample for the first 150 tons
  - 2nd composite sample for the first 300 tons
  - 3rd composite sample for the first 750 tons
  - 1 additional composite sample for every additional 750 tons
- Obtain approval from National Grid's project manager
- Obtain appropriate hazardous waste manifests in accordance with the NYSDEC manifest acquisition hierarchy (6 NYCRR Part 372)
- Label hazardous waste containers in accordance with 40 CFR Part 262.34 and 49 CFR Part 172 requirements
- Separate all wastes (*e.g.*, hazardous [if any], non-hazardous pursuant to TAGM 4061, and non-hazardous)
- Provide original bills of lading and manifests to National Grid, with copies to the Engineer, upon receipt from the transportation and disposal vendors. The Contractor shall utilize National Grid-supplied non-hazardous bills of lading for shipment of non-hazardous materials (unless otherwise approved by National Grid)
- Provide copies of the Uniform Hazardous Waste Manifest Form and Land Disposal Restriction Form with hazardous waste shipments

- Implement a waste tracking management system to comply with 40 CFR Part 262.40 recordkeeping requirements

## REFERENCES

National Grid. *National Grid USA Companies Environmental Procedure No. 1 Waste Management and Recycling Procedures Manual.*

National Grid. 2004. *National Grid Safety Procedure; Contractor Safety Requirements.* August 5, 2004, as revised January 30, 2007.

NYSDEC. 2002. Technical and Administrative Guidance Memorandum (TAGM) 4061, *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants.* Published January 11, 2002.

NYSDEC, 2011. Decision Document, NM-Herkimer Smith St. MGP Voluntary Cleanup Program Herkimer, Herkimer County, Site Number V00471, December 19. 2011.

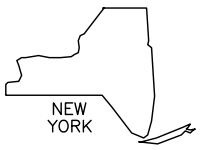
O'Brien & Gere. 2011. Remedial Action Work Plan. October 19, 2011.

FIGURE 1


ADAPTED FROM: USGS 7.5 QUADS. SERIES LITTLE FALLS, NY, 1943

NATIONAL GRID
FORMER MGP SITE
HERKIMER, NEW YORK

## SITE LOCATION MAP




QUADRANGLE LOCATION

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

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MARCH 2012

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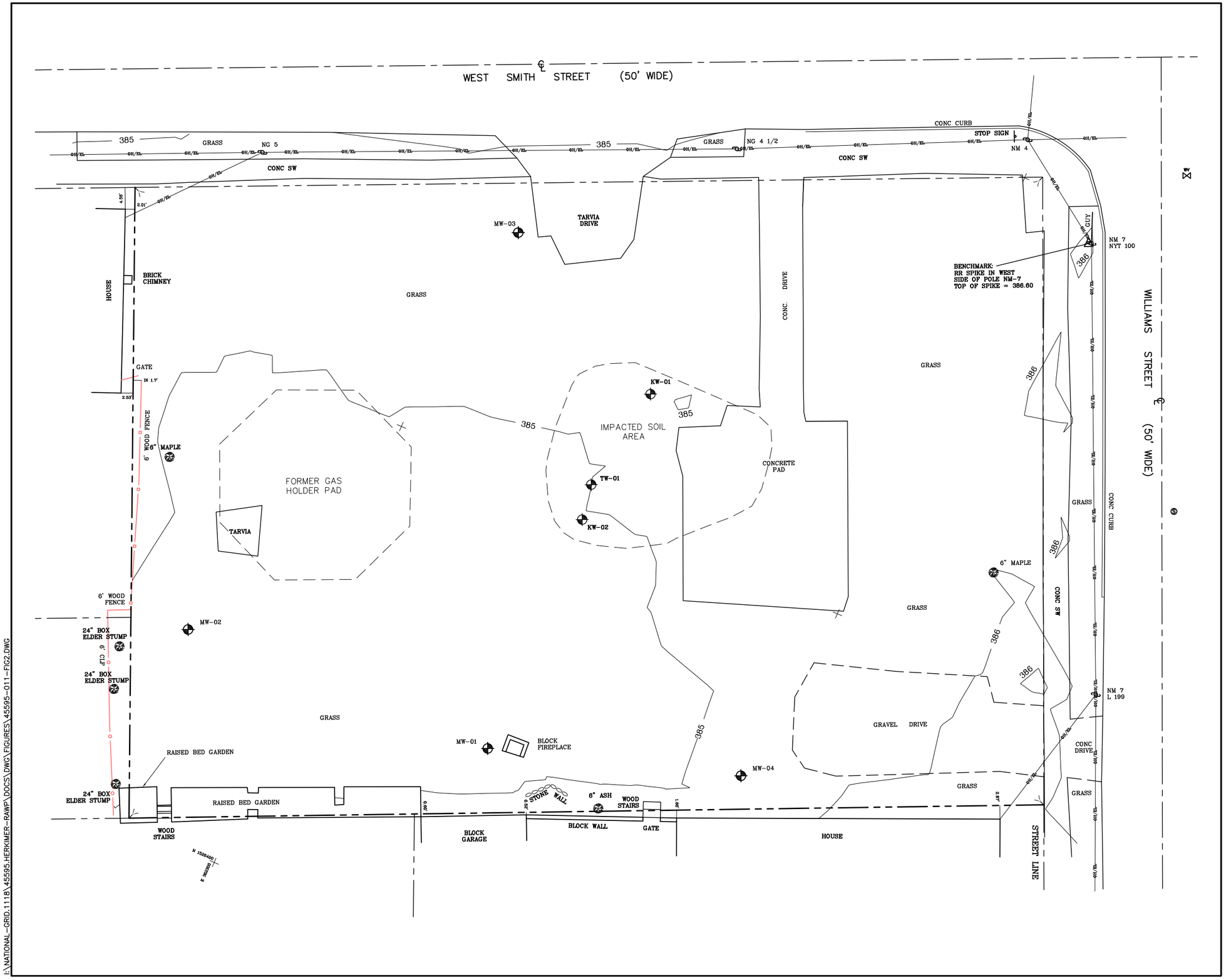
FIGURE 2




# NATIONAL GRID
# FORMER MGP SITE
# HERKIMER, NEW YORK

## SITE PLAN

1"=20' (20 0 20)

FILE NO. 1118.45595.011
MARCH 2012

O'BRIEN & GERE

I:\NATIONAL_GRID.1118\45595.HERKIMER-RAWP\DOCS\DWG\FIGURES\45595-011-FIG2.DWG

# *National Grid USA Companies Environmental Procedure No. 1 Waste Management and Recycling Procedures Manual*

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# *National Grid Environmentally-Approved Hazardous Waste Disposal and Recycling Facilities*

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# *Village of Herkimer Publically Owned Treatment Works (POTW) – Requirements and Limits for Discharge to Sanitary Sewer*

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# *Erosion and Sediment Control Plan*

SECTION 02270

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes erosion and sediment control performed to minimize erosion of soils and sediments into drainage channels, and lands adjacent to or affected by the Work, and to prevent stormwater run-on onto work areas and to prevent potentially contaminated stormwater run-off (including soils and sediment) from leaving the site without appropriate treatment.

B. Erosion and sediment control measures to be implemented shall be in accordance with this specification, and as may be required by the New York State Department of Environmental Conservation (NYSDEC). In the event of discrepancies between this Specification and the NYSDEC requirements, the NYSDEC requirements shall govern.

C. Erosion and sediment controls shall be installed and maintained at additional locations as ordered by the Engineer and without additional cost when the Engineer is of the opinion that additional measures may be required to provide adequate erosion and sediment control.

1.2 REFERENCES

A. Materials and installation shall be in accordance with the project stormwater pollution prevention plan (SWPPP) and the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. 40 CFR 122 U.S. Environmental Protection Agency (USEPA) Administered Permit Programs: The National Pollutant Discharge Elimination System

2. 40 CFR 123 State Program Requirements

3. 40 CFR 124 Procedures for Decision Making

4. NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-0-10-001.

5. NYSDEC Standards and Specifications for Erosion and Sediment Control. (NYSDEC 2005).

6. New York State Stormwater Management Design Manual (the design Manual) prepared by the Center for Watershed Protection for the NYSDEC (2010).

1.3 SPECIAL REQUIREMENTS

A. In addition to appropriate permit and Erosion and Sediment Control (ESC) Plan requirements, construction procedures shall include protection of the environment in accordance with all pertinent Federal, State and local regulations. Construction procedures that are prohibited in the undertaking of work associated with this project include, but are not limited to:

1. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

2. Pumping of silt-laden water from trenches or other excavations into any surface waters, or any stream corridors, or wetlands.

3. Damaging vegetation beyond the extent necessary for the work of this project.

4. Disposal of trees, brush, and other debris in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

5. Dumping of spoil material into any stream corridor, surface waters, or at any unspecified or unapproved locations.

6. Open burning of any debris.

B. Prior to initiating site disturbance, the Contractor shall install ESC facilities in accordance with the ESC Plan. In addition, the Contractor shall place silt fence along the downgradient perimeter of the work areas and spoil piles and as directed by the Engineer. The ESC facilities shall be maintained throughout construction until the site is stabilized pursuant to GP-0-10-001.

C. The Engineer shall have the authority to limit the surface area exposed by clearing, grubbing and excavation, and to direct the Contractor to implement additional erosion, run-off and run-on control measures as he deems necessary with no additional consideration for payment being made to the Contractor in this regard.

PART 2 PRODUCTS

Section not used

PART 3 EXECUTION

3.1 GENERAL

A. Clearing schedules shall be formulated to provide minimum practical exposure of soils. Local run-on/run-off control measures shall be implemented as conditions

warrant. The Contractor shall make every reasonable effort so as to not unduly disturb the ecological or environmental quality of the area.

3.2 EROSION AND SEDIMENT CONTROL

A. During the land disturbance life of this project, the following sequence shall be adhered to:

1. Install stabilized construction entrances at access and egress locations.

2. Clearing and grubbing for those areas necessary for installation of perimeter controls.

3. Construction of perimeter controls including, but not necessarily limited to the installation and maintenance of silt fencing along the entire downgradient perimeter beyond the outer limits of potential set-up and work areas.

4. Remaining clearing and grubbing.

5. Trenching and excavation, providing temporary stabilization/erosion/run-off/run-on controls as required.

6. Final grading and permanent stabilization.

7. Removal of ESC facilities.

B. Erosion and sediment control measures may include straw bale dikes, silt fences, earth dikes, stone check dams, stone outlet sediment traps, stabilized construction entrances, rip rap, seeding/sodding, properly anchored mulch, and/or other measures as required.

C. Erosion and sediment control measures shall be properly maintained and adequately functioning. Any existing measures that are damaged shall be immediately repaired.

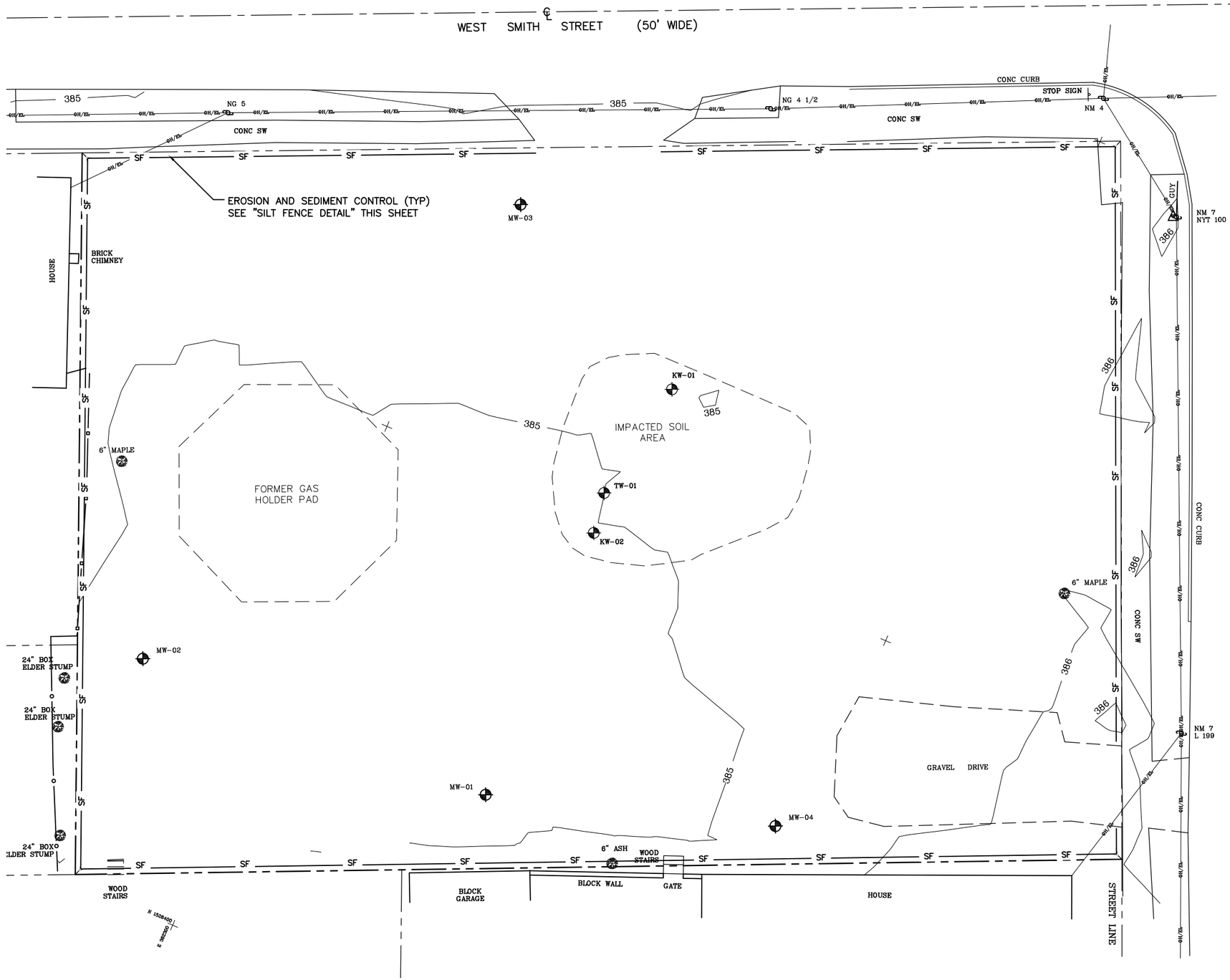
D. Excavated material shall be protected from erosion by using appropriate devices or stabilization.

E. Trapped sediment shall be removed from the area of deposition and disposed of in accordance with the Section “Earthwork.”

F. As soon as possible after disturbance of a graded area, slope stabilization through the use of seeding, mulches (wood chips or straw anchored appropriately) or matting shall be provided.

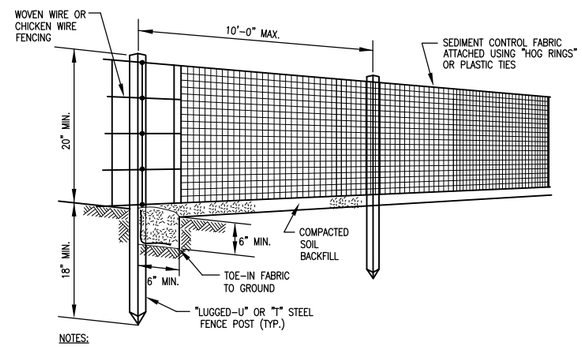
G. Stormwater that has come into contact with potentially contaminated sources shall be treated in accordance with the Section "Construction Water Management."

* * * * *




## DRAWING NOTES:

1. ALL SILT FENCE LOCATIONS SHOWN HERE ARE APPROXIMATE ONLY AND SHALL BE PROVIDED AT A MINIMUM.
2. THE CONTRACTOR SHALL MAINTAIN OR PROVIDE BYPASS OF FLOW FROM EXISTING DRAINAGE CHANNELS AT ALL TIMES. PROPER EROSION CONTROL TECHNIQUES SHALL BE IMPLEMENTED AS REQUIRED IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED EROSION AND SEDIMENT CONTROL PLAN, SPECIFICATION 02270 "EROSION AND SEDIMENT CONTROL" AND SPECIFICATION 02110 "STORMWATER POLLUTION PREVENTION".
3. THE CONTRACTOR SHALL INSTALL EROSION AND CONTROL MEASURES PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION.




NOTES:

1. SILT FENCE SHALL BE PLACED AS INDICATED ON THE GRADING/EROSION CONTROL PLAN AND AS DESCRIBED IN THE PROJECT SWPPP.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER- LAPPED BY SIX INCHES AND FOLDED.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
6. FENCE TO BE ALIGNED ALONG CONTOUR AS CLOSELY AS POSSIBLE.
7. FENCE SHALL BE DOUBLED AT THE TOE OF ALL SLOPES GREATER THAN 15 PERCENT, AND ADJACENT TO WATER BODIES.

POSTS : STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE : WOVEN WIRE 14.5 GAUGE 6" MAX. MESH OPENING

FILTER CLOTH : MINIMUM TENSILE STRENGTH OF 120 LBS. (ASTM D-16826)

PREFABRICATED UNIT : MIRAFI ENVIROFENCE, OR APPROVED EQUAL

STANDARD SYMBOL —— SF ——

## SILT FENCE DETAIL

NOT TO SCALE

| NO. | DATE | REVISION | INIT. |
|---|---|---|---|
| A | 3/21/12 | ISSUED FOR CLIENT REVIEW | |

1"=10' 10 0 10 20

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

**PRELIMINARY NOT FOR CONSTRUCTION**

DATE: 3/21/12

O'BRIEN & GERE

NATIONAL GRID – FORMER HERKIMER MGP SITE
HERKIMER COUNTY, NEW YORK
SITE NO. V00471-6

REMEDIAL DESIGN

GENERAL

# EROSION & SEDIMENT CONTROL PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.45595.004

DATE MARCH 2012

G-3

I:\NATIONAL-GRID.1118\45595.HERKIMER-RAMP\DOCS\DWG\CONTRACT DRAWINGS\45595-003-G2G3G4G5G6.DWG

# *NYS Department of Health Generic Community Air Monitoring Plan, and Fugitive Dust and Particulate Monitoring Plan*

**Appendix 1A**
**New York State Department of Health**
**Generic Community Air Monitoring Plan**

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

**Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/$m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/$m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/$m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/$m^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

## Appendix 1B
## Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50$^{o}$ C (14 to 122$^{o}$ F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

HEALTH & SAFETY PLAN

# Former Manufactured Gas Plant Site
# Herkimer, New York

nationalgrid

November 2, 2012

## REVISION SUMMARY

| Revision Date | Description of Changes | Reason For Change |
|---|---|---|
| | (Section title or number – description) | (individual name or title, company / agency name, document reference and date) |
| April 27, 2012 | NA | Pre-final Submittal to NYSDEC |
| November 2, 2012 | Revision to include special circumstance CAMP | Final Submittal to NYSDEC |

# PREFACE

This document describes the minimum anticipated protective measures necessary for worker health and safety during the activities associated with this project. Contractor employees and subcontractors must read and understand the contents of this document. We do not intend the contents of this document to cover all situations that may arise nor to waive any provisions specified in Federal, State, and local regulations or National Grid/ contractor health and safety requirements. During this project, if any task occurs that is not covered in this Project Safety Plan, the individual responsible for that task will inform Contractor's Corporate Health & Safety Department. Site personnel affected by the new activity and its associated hazards must ensure that they follow necessary safety procedures and use appropriate protective equipment.

# TABLE OF CONTENTS

## FIGURES / TABLES



## ATTACHMENTS



## APPENDICES

# 1 INTRODUCTION

This Health & Safety Plan (HASP) has been developed to outline the minimum requirements to be met by Contractor employees, subcontractors (if any), and visitors while performing activities outlined herein and at the former Manufactured Gas Plant (MGP) Site in Herkimer, New York. This HASP describes the responsibilities, training requirements, protective equipment, and safety procedures necessary to minimize the risk of injury, fires, explosion, chemical spills, and material damage incidents related to construction activities. This HASP incorporates by reference the Occupational Safety and Health Administration (OSHA) regulations contained in 29CFR1910 and 29CFR1926. Also, incorporated by reference are the **EPA Standard Operating Safety Guides, Publication 9285.1-03, June 1992.**

The requirements and guidelines in this HASP are based on a review of available information and data, and an evaluation of identified on-site hazards. This HASP will be reviewed with site personnel and will be available on-site. Contractor employees, subcontractors, and visitors will report to the on-site Project Field Supervisor (or equivalent) in matters of health and safety. The Project Field Supervisor (or equivalent) is responsible for implementation of this HASP into daily site activities, overseeing compliance with this HASP, and stopping work when necessary.

**Contractor employees and subcontractors (if any) must review this safety plan prior to beginning work and sign the Pre-Work Briefing / Safety Compliance form (*Attachment 1*).**

## 1.1. COVERED PERSONNEL

This HASP is specifically intended for Contractor employees, subcontractors, and visitors who will be conducting activities within the defined scope of work in specified areas of the site. Contractor will inform site personnel of identified safety and health hazards as outlined in this HASP. Contractor employees, subcontractors, and visitors are responsible for complying with government regulations, National Grid policies, and this HASP as it relates to their scope of work. This HASP may be provided to interested third parties for informational purposes.

## 1.2. HASP REVIEW & MODIFICATION

Future actions that may be conducted at this site and unexpected conditions that may be encountered may require the modification of this HASP. The Project Field Supervisor will recommend modifications to this HASP, and the Contractor Corporate Safety Manager will have the responsibility of approving them. Modifications to this HASP shall be outlined on the ***Revision Summary*** page.

This HASP may be modified for new or additional scopes of work by directly revising this HASP and saving a revised copy or by developing supplemental Job Safety Analyses (JSAs) based on a template in ***Appendix A***. JSAs may modify air sampling, personal protective equipment, and other safety precautions in this HASP as necessary to safely perform new work activities.

## 1.3. SITE DESCRIPTION

The Herkimer Former MGP Site occupies approximately 0.4 acres of an approximately 0.585 acre parcel in a residential neighborhood in the City of Herkimer, New York. The site is bordered to the north by East Smith Street, to the east by Williams Street and to the west and south by residential properties. The site is currently owned by an adjacent resident and is vacant and not fenced. The surrounding neighborhood includes residential and commercial properties. The area is served by public water and sewer systems.

The site is relatively flat with elevations ranging between approximately 386 ft msl and 384 ft msl. The southern portion of the site is elevated approximately 4 ft with respect to the two adjacent properties to the south. Drainage occurs by overland flow generally from the northeast toward the southwest. The majority of the site is grassed with limited areas of asphalt and remnants of concrete foundations. Surficial structures related to the former MGP are no longer present on-site. Remnants of concrete pads and a sidewalk are visible

on the surface in the center of the parcel. In addition, the investigations identified that the octagonal holder, including the conical base, is still present on the west side of the site.

## 1.4. SCOPE OF WORK

This HASP has been developed for field construction services to be provided by Contractor to support implementation of a remedy developed for the Herkimer Former MGP Site consistent with the requirements of the Remedial Action Work Plan (RAWP) (O'Brien & Gere, October 2011) and the 2002 multi-site Voluntary Consent Order (VCO Index No. D0-0001-001) between Niagara Mohawk (now National Grid) and the New York State Department of Environmental Conservation (NYSDEC).

Primary components of the NYSDEC-approved remedy presented in the RAWP are outlined below and will be performed by the Contractor. Specific tasks necessary to implement the RAWP will include abandoned utility, concrete and asphalt removal; excavation support; excavation and trenching; removal of tar waste and other MGP and petroleum impacted soil; transportation and disposal off-site of tar waste and MGP and petroleum impacted soil; groundwater monitoring well decommissioning; construction water removal, treatment and discharge; groundwater monitoring well installation,; and site restoration.

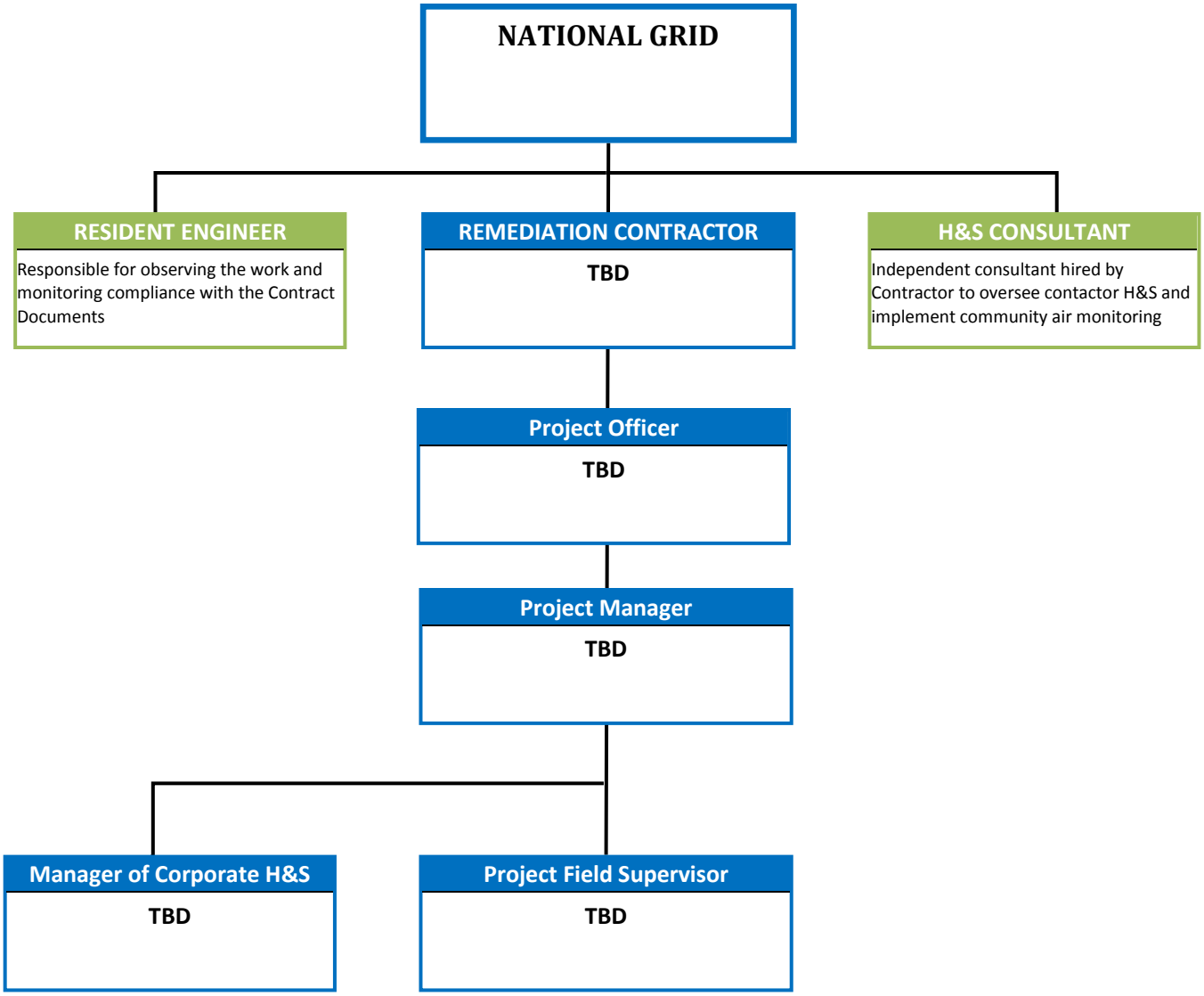
## 1.5. PROJECT PERSONNEL & ORGANIZATION

The following are key project personnel with respect to the Contractor's scope of work.

| | |
|---|---|
| **NATIONAL GRID** | |
| **Steven Stucker** | Project Manager |
| **O'BRIEN & GERE** | |
| **James R. Heckathorne, PE** | Project Officer |
| **Steve W. Anagnost, PE** | Project Manager |
| **Jeffrey R. Parsons, CIH** | Manager of Corporate H&S |
| **(To be determined)** | Resident Engineer |

## 1.6. PROJECT PERSONNEL & ORGANIZATION

The following organization chart outlines reporting relationships including Contractor's relationship with National Grid, the Resident Engineer, and the independent third-party health and safety consultant hired by the Contractor.




## 1.7. RESPONSIBILITIES

While implementation of and monitoring compliance with the HASP is the responsibility of the Contractor, all project personnel have authority to stop work if a life-threatening condition or behavior is observed.

### 1.7.1. Contractor Project Officer

The Project Officer is responsible for providing upper level management support for health and safety. He or she will provide sufficient authority and resources to the project team to fully implement health and safety requirements as outlined in this HASP, contract documents, and regulatory requirements.

### 1.7.2. Contractor Project Manager

The Project Manager is responsible for overseeing project safety requirements and making sufficient resources (training, time, and equipment) available to field personnel to implement project safety requirements. The Project Manager is also responsible for conducting periodic safety inspections and coordinating timely correction of observed deficiencies with respect to Contractor's scope of work.

### 1.7.3. Contractor Project Field Supervisor

The Project Field Supervisor is responsible implementation of this HASP into daily site activities, overseeing compliance with this HASP, and stopping work when necessary.

### 1.7.4. Resident Engineer

The Resident Engineer is responsible to help resolve project design issues as well as provide general site information that may be requested for health and safety purposes. The Resident Engineer is the main point of contact related to design support during construction activities. In particular, the Resident Engineer coordinates the development of the design documents including updates to design documents. The Resident Engineer also reviews and comments on the site HASP and observes compliance with the HASP on a daily basis with respect to field engineering tasks, making National Grid aware of non-compliance when observed.

### 1.7.5. Contractor's Manager of Corporate Health & Safety

The Contractor's Manager of Corporate Health & Safety will make safety-related recommendations regarding the work area and engage ongoing support from the Corporate Safety Department as necessary. Inspections will periodically be conducted to monitor worker health and safety and will address issues such as subcontractor pre-qualification, site safety orientation programs and documentation, implementation of permit programs (confined space, hot work, etc.) safety planning, accident investigations, meetings with client, adequacy of personal protective equipment (PPE), air monitoring needs, and general construction safety issues. The Contractor's Manager of Corporate Health & Safety will approve modifications to this HASP and will prepare a Monthly Safety Report.

### 1.7.6. Subcontractor Safety Competent Person

***NOTE – Subcontractors must provide a full-time Safety Competent Person when 15 or more field workers are on-site. Subcontractor's Safety Competent Person must be acceptable to O'Brien & Gere.***

All subcontractors under contract to the Contractor are covered by the Contractor's HASP and will be required to designate a Safety Competent Person. The Safety Competent Person must be the Superintendent/Foreman unless the project is sufficiently large to require a full-time Safety Competent Person. A Safety Competent Person must be on site at all times when the subcontractor has employees performing work for Contractor and will have the same responsibilities as the Contractor's Project Field Supervisor within the subcontractor's scope of work. This individual must possess a sound working knowledge of pertinent OSHA regulations, this HASP, and other applicable safety requirements related to scope of work. The competent person will ensure timely correction of identified safety deficiencies. An Alternate Safety Competent Person may also be designated as a backup.

# 2 SITE SAFETY & CONTROL PROCEDURES

This Health & Safety Plan (HASP) incorporates by reference the Occupational Safety and Health Administration (OSHA) requirements in 29 CFR Part 1910, 29 CFR Part 1926. Subcontractors must review the site HASP to ensure they meet or exceed the requirements as well as all regulations applicable to their scope of work. Minimum site safety procedures applicable to Contractor employees and subcontractors are described in more detail in this section. ***This HASP also incorporates National Grid safety specifications and policies by reference.***

## 2.1. SITE SECURITY & CONTROL

***NOTE – On this project, requirements in this section apply as a minimum standard of care to Contractor employees and subcontractors (if any).***

The elements of site control include restricting access to the site to persons who have the proper safety training and have received a site safety orientation that reviews the information in this HASP at a minimum. Contractor will oversee site security and control with specific site-entry requirements as follows:

### 2.1.1. Contractor Prequalification

National Grid may prequalify Contractors and subcontractors based on safety performance. A

### 2.1.2. Citizenship

All project personnel must be U.S. citizens or legally be authorized to work in the U.S. with the proper work visas.

### 2.1.3. Language

All project personnel must understand and speak English at a "conversational" level. The Contractor is responsible for all costs or delays incurred if non-English speaking employees are banned from the site. National Grid or its designated representative will make the final determination if a person is sufficiently fluent in English. Interpreters may be used if authorized by National Grid. When authorized, a minimum of one interpreter will be required for every 10 non-English speaking personnel at all times while work is on site.

### 2.1.4. Drug & Alcohol Testing

All project personnel are required to work in accordance with National Grid policy for a Drug Free Workplace, as appropriate. All site personnel are expected to work without being under the influence of drugs or alcohol. If any site worker is observed exhibiting symptoms or behaviors reasonably associated with drug or alcohol abuse, the individual will be requested by National Grid, the Resident Engineer, or H&S Consultant to take a drug and/or alcohol test at a designated medical facility qualified to perform such testing. Refusal to take drug or alcohol tests when requested will be treated as a “positive” test result and the individual removed from the site.

### 2.1.5. Safety Training & Competent Persons

Project personnel must be properly trained for the type of work being performed and consistent with OSHA Standards 29CFR1910 and 29CFR1926. Specialized training is required for (but not limited to) work with asbestos, lead, hazardous waste, confined space entry, fire prevention and control, lockout / tagout, hazard communication, fall protection, NFPA 70E (energized electrical), etc.

HAZWOPER TRAINING - Project personnel will be trained as required by the OSHA Hazwoper Standard 29CFR1926.65 and 1910.120 as outlined below:

- **Non-Contact Visitors & Workers** – No OSHA 24/40 Hour for Non-Contact Visitors, including delivery personnel, utility workers, vendor reps, inspectors, surveyors, site preparation personnel and others who will not enter exclusion or contamination reduction zones.
- **Contact/Remediation Workers** – OSHA 40 hour training with current 8-hour refresher. All site personnel who may contact contaminated soil, sediment, groundwater, or materials or must otherwise enter an Exclusion or Contamination Reduction Zone. Site personnel with limited potential for contact with contaminated soil, sediment, or water may enter Exclusion Zones with OSHA 24 hour training with a current 8-hour refresher. An example of a trade in this category is surveyors.
- **Hazwoper Supervisors, Superintendents, and Foreman** – Field management personnel who are overseeing work performed by "Contact/Remediation Workers" must have OSHA 8-hour Hazwoper Supervisor training.

HEAVY EQUIPMENT QUALIFICATIONS - In addition to having appropriate Hazwoper training, only qualified persons may operate heavy equipment including (but not limited to) the following:

- **Forklift License** – Required for operation of forklifts and lulls but NOT required for frontend loaders equipped with forks
- **Crane Operation** – Crane operator license (state-issued) or Certified Crane Operator (CCO) designation
- **General Heavy Equipment** – Contractor and subcontractors will designate in writing to Resident Engineer their employees who are trained and authorized to operate heavy equipment including manlifts, excavators, front loader, dozers, demolition hammers, shears, grapples, dump trucks, pulverizers, skid steer, and drill rigs

COMPETENT PERSONS - Although Contractor and subcontractors must designate a general Safety Competent Person, other competent persons must also be designated in Contractor and subcontractor safety plans or JSAs for the following activities and be on site as necessary to support activities performed under their oversight. In addition to written designation, the Contractor and subcontractor must submit evidence of competency when requested by the Resident Engineer. The general Safety Competent Person may also assume responsibility for other competent person roles if qualified and authorized.

- **Excavation Competent Persons** – When excavations are being performed
- **Demolition Competent Persons** – Perform pre-demolition "engineering survey" in support of a demolition plan. During demolition, the competent person must perform regular inspections to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material
- **Scaffolding Competent Persons** – Supervise the erection and dismantling of scaffolds and perform daily inspections while scaffolds are in use
- **Fall Protection Competent Persons** – Oversee implementation of fall protection systems including anchoring personal arrest equipment
- **Welding & Cutting Competent Persons** – Must determine if coated surfaces are flammable. For this project, they must also assess combustibility of underlying surfaces and residual dust
- **Crane & Hoist Competent Persons** – Must inspect cranes and hoists prior to use
- **Rigging Equipment Competent Persons –** Must inspect rigging equipment prior to use
- **Ladder Competent Persons** – Periodically inspect ladders
- **Powder Actuated Tools** – Training certification to safely use Hilti Guns, Ramset Guns, and similar powder actuated tools

### 2.1.6. Project Safety Orientation

All project personnel must complete a Project Safety Orientation to ensure understanding of these ***and National Grid*** safety requirements. Upon completing a Project Safety Orientation, project personnel will sign a **Pre-Work Briefing form** ***(Attachment 1 or equivalent).*** The Project Safety Orientation will focus on hazards and the required hazard controls as outline in the HASP and/or Pre-Work JSA and will at a minimum include:

- Applicable Sections of the Project Safety Plan (HASP)
- Pre-Work JSAs (if any)
- Associated Exhibits, Permits, and Attachments identified on (and attached to) the Pre-Work JSA

### 2.1.7. Entry/ Exit Log

The Contractor shall require that all employees, subcontractors, and visitors to sign in and out on an **Entry / Exit Log** ***(Attachment 2 or equivalent).***

### 2.1.8. Authorized Project Personnel

At a minimum, authorized personnel who will be granted unescorted access to the project include National Grid and National Grid's designated representative, Resident Engineer, NYSDEC, employees from Contractor and appropriately prequalified subcontractors that have successfully completed the following:

- Submitted Safety Training and Competent Person documentation to the Resident Engineer
- Submitted medical surveillance documentation (for persons entering Exclusion and Decontamination Areas)
- Submitted respirator medical clearance (for persons who may use respirators)
- Attend a Contractor Project Safety Orientation (applicable sections of this HASP)

### 2.1.9. Visitors

Visitors must be escorted by an Authorized Project Person.

### 2.1.10. Pre-Work Safety Planning

The Contractor and subcontractors are required to complete the Pre-Work JSA Template ***(Appendix A)*** prior to mobilization and may complete additional Pre-Work JSAs as required for high-hazard tasks. The Pre-Work JSA should be completed in a collaborative effort between Contractor and subcontractors and will help identify appropriate permits and notifications based on the specific means, methods, tools, and equipment used by subcontractors.

The Contractor may also use the Pre-Work JSA Template to identify hazards and controls associated with changes to Contractor's scope of work. JSAs will supplement information in this HASP.

### 2.1.11. Site Layout & Work Zones

***NOTE – The Contractor is responsible for erecting barricades and signs in accordance with National Grid policies and specifications which may (or may not) be similar to requirements outlined in this section.***


The visible delineation of the Construction Area is required to prevent unauthorized persons from entering. Physical markings of the perimeter of the Construction Areas can be accomplished through the use of fencing, wood barricades, rope, barricade tape, etc.

Existing structures or land features may also be utilized where appropriate.

**The use of barricade tape for outdoor exclusion zones or work zones that will be setup for greater than 24 hours is not permitted.**

Warning signs will be posted on at the perimeter of site as well as any Exclusion and Contamination Reduction (Decontamination) Zones to alert site personnel and the public. Signs shall be approximately 10 inches by 14 inches in size and of aluminum or steel construction for outdoor use. The site perimeter must be posted but with a sign that is different from that used for any Exclusion Zones and states "DANGER – CONSTRUCTION AREA – UNAUTHORIZED PERSONNEL KEEP OUT" (Emedco # 42525) or acceptable alternate. Signs marking the perimeter of Exclusion Zones must state the following or an acceptable alternate (Emedco # 33989): "RESTRICTED AREA – AUTHORIZED PERSONNEL ONLY."


The following work zones will be established as required by the OSHA Hazwoper standard (29CFR1926.65 / 1910.120) where intrusive excavation activities may be required.

### 2.1.12. Contamination Control & Decontamination

***NOTE – The Contractor is responsible for contamination control in accordance with National Grid policies and specifications which may (or may not) be similar to requirements outlined in this section.***

Basic precautions that will be implemented to remove contaminated soils and manage contaminated groundwater without spreading contamination beyond the boundaries of the site.

- Exclusion zones and decontamination areas will be clearly marked and protected against unintentional entry by unauthorized persons as outlined above
- The Staging Area will be lined and equipped with a sump and water management equipment (pumps, piping/hose, frac tank, etc.) if saturated soils must be staged prior to disposal
- All heavy equipment will be cleaned using shovels and brooms to remove gross contamination prior to being moved between excavation areas to minimize cross contamination
- Wet soil or waste will be de-watered or will be blended with dry soil, cement, sawdust or equivalent material to prevent "dripping" during transportation
- Haul trucks will be kept on clean haul roads/surfaces to prevent contamination of tires
- Haul truck loading areas located adjacent to staged soil will be kept clean from spillage during loading operations. If necessary, plastic will be placed under haul vehicles while loading and periodically swept clean to prevent contamination of haul vehicle tires. Plastic will be replaced as necessary.
- Heavy equipment will be decontaminated with pressurized water at a decontamination pad prior to leaving the site and/or working in areas deemed "clean". The decontamination pad will consist of a plastic liner on grade and/or stone sub base with water management equipment (sump, pump, holding tanks, etc.)
- Hand washing facilities will be located on site for daily use by field personnel

### 2.1.13. Vapor & Odor Control

***NOTE – The Contractor is responsible for vapor and odor control in accordance with National Grid policies and specifications which may (or may not) be similar to requirements outlined in this section.***

Vapors released during site activities represent a potential health hazard and odor problem. The following controls will be implemented to mitigate these issues:

- Controlling the amount of soils/sediments disturbed concurrently.
- Open excavations and exposed stockpiled contaminated soil will be covered with polyethylene sheeting at the end of each work day
- If sheeting does not adequately control odors, Bio-Solve or a water-based foaming agent (or equivalent) will be applied as necessary for short-term (18-hour/overnight) control
- Water Spray or Piian Flexi-fog system (or equivalent)
- Commercial grade fans
- Air monitoring will be conducted per the Employee & Community Air Monitoring Program (ECAMP)

### 2.1.14. Dust Control

***NOTE – The Contractor is responsible for dust control in accordance with National Grid policies and specifications which may (or may not) be similar to requirements outlined in this section.***

Dust released during remedial activities represents a nuisance and a potential health hazard.

The following controls will be implemented to mitigate dust issues:

- Water will be used to suppress dust during demolition and excavation activities as required by dust monitoring and visual observations
- A water truck will be on site to support dust control activities if dry, dusty conditions are encountered
- A site speed limit of 10 mph (or as otherwise posted) will be enforced. Slower vehicle speeds reduce road dust and minimize the potential for accidents and spills. Dust monitoring will be conducted per the Employee & Community Air Monitoring Program (ECAMP).

## 2.2. DAILY SAFETY MEETINGS

Safety meetings must be held daily and documented using a **Daily Pre-Task Planner** (***Attachment 3***) or equivalent document approved by the Resident Engineer.

The use of Pre-Task Planners during daily safety meetings provides documentation about what "safety messages" site personnel are receiving on a daily basis. Pre-Task Planners also provide a checklist to monitor changes to site personnel, equipment, work methods, or conditions that may affect hazards and require different safety precautions. Pre-Tasks Planners are intended to supplement, but not replace, Pre-Work JSAs and safety plans. Pre-Task Planners will be retained on site for inspection during periodic safety audits.

The form will be completed as follows:

- Contractor or subcontractor crew foremen will prepare a Daily Pre-Task Planner for that day's activities or the next day's activities if the Daily Pre-Task Planner is prepared the prior afternoon
- The Supervisor/Superintendent/or Foreman will review the Pre-Task Planner with his respective crew
- Each site worker will then sign the Pre-Task Planner
- All Pre-Task Planners will be returned to Resident Engineer after the day's activities are complete

- Any significant changes to the scope of work or work methods during the work shift will require revising the Pre-Task Planner. Recognition of previously unidentified hazards will also require revising their safety plan or Pre-Work JSAs.

## 2.3. WEEKLY TOOLBOX SAFTEY MEETINGS

Toolbox Safety meetings are to be held at a minimum of once per week. The Contractor Field Supervisor on smaller projects with fewer site personnel may choose to assemble all site personnel during Daily Safety meetings and in so doing, may not hold separate Weekly Toolbox Safety Meeting. On projects where separate Daily Safety meetings are held for different field crews, the Contractor Field Supervisor will assemble all site personnel at a Weekly Toolbox Safety meeting ("All-Hands" Safety meeting). The intent of the weekly toolbox meeting is to provide additional field safety training and review relevant safety topics for approximately 15 minutes, and to deliver a consistent safety message to all site personnel on larger projects. Attendance will be documented on the **Safety Toolbox Meeting forms** ***(Attachment 4 or equivalent).***

## 2.4. SAFETY AUDITS & INSPECTIONS

Contractor will conduct formal weekly safety audits that are documented using a safety audit checklist. Subcontractors may also participate in safety audits. A variety of checklists are available with one being the **Safety Audit Checklist** (***Attachment 5***).

## 2.5. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Specific PPE requirements are outlined below but a general dress code for any work areas includes long pants that must cover top of ANSI-approved protective toe leather work shoe, hard hat, and safety glasses with rigid side shields. Shirts must have at least 4 inches of sleeve. Long-sleeve shirts may be required at specific locations or for certain tasks. **Gloves are required for all tasks unless glove use is exempted on an approved Job Safety Analysis (JSA) or Daily Pre-Task Planner.** Contractor and subcontractors must specify additional PPE as appropriate for specific work methods, tools, and equipment covered by their safety plans. Additional PPE that may be necessary is summarized in the following paragraphs.

### 2.5.1. High Visibility Clothing

All project personnel are required to wear high visibility clothing including a vest, shirt, or jacket. High visibility clothing must be predominantly safety yellow in color.

### 2.5.2. Head Protection

All project personnel are required to wear approved hard hats that meet ANSI Z89.1-2003. Hard hats must be in good condition and be worn with brim to the front unless the manufacturer certifies the hard hat to be worn reverse when the harness is oriented properly. Contractor and subcontractors will be required to submit manufacturer's certification upon request from Resident Engineer.

### 2.5.3. Eye & Face Protection

Project personnel are required to wear approved ANSI Z87.1-2003 safety glasses with rigid side shields. **Chemical goggles** are required during equipment decontamination work or other activities with a potential for chemical splashes to the face. **Face shields** will be required when performing certain tasks (*e.g.* chipping, sawing, and handling chemicals or corrosive liquids) **Face shield must be worn over safety glasses or chemical goggles.**

### 2.5.4. Hearing Protection

Approved hearing protection must be worn as specified in all posted areas and while working with or around high noise level producing tools, machines or equipment.

### 2.5.5. Fingers, Hand & Wrist

Cut resistant gloves suitable for the job being performed shall be worn unless the job cannot be done with gloves or wearing gloves increases the hazard. **Exceptions to mandatory glove use must be identified in approved safety plans or JSAs.** Tool holders should be used when driving stakes and wedges or when holding star drills, bull pins or similar tools.

Chemical resistant gloves should be worn when there is a potential for contact with contaminated soil or groundwater. "Standard" nitrile gloves are adequate for heavier exposures but nitrile surgical gloves are required for heavier exposure such as sampling, surveying, equipment operators, inspectors, etc. Cut resistant gloves used in the Exclusion Zone may be re-used and discarded when worn out or work is completed as long as they remain in the Exclusion Zone.

### 2.5.6. Foot Protection

All project personnel are required to wear safety footwear that is in accordance with ANSI Z41-1991. Rubber boots with safety toe protection are required on jobs subject to chemically hazardous conditions. Metatarsal protection should be worn when using jack hammers, tamps and similar equipment which has the potential for foot injury above the toes.

### 2.5.7. Respiratory Protection

***NOTE – Respiratory hazards may exist if vapors or dust exceed site air monitoring action levels.***

Respirators (including SCBAs and airlines) used by project personnel must meet NIOSH/MSHA standards. Respirators must be inspected regularly and stored in a dust-free container. Employees required to wear a respirator must have a physician's approval and be fit tested within the last year. Employees must be clean shaven in the facial area to obtain an acceptable seal. Contractor and subcontractor personnel must keep respirator training, fit testing, and medical clearance documentation on site for the duration of the project and available for Resident Engineer inspection. The following table summarizes common respiratory hazards that may be encountered during remediation and demolition activities. Those that are present or are potentially present are marked (✓). Additional (usually less common) respiratory hazards that may be present will be added to the table and also marked (✓).

| Respiratory Protection by Contaminant | | | |
|---|---|---|---|
| **Present (✓)** | **Contaminant** | **Minimum Respirator Type*** | **Source of Exposure** |
| ✓ | Polynuclear Aromatic Hydrocarbons (PAHs) | Respirator with any filter (N95, N100, P95, or P100) | During excavation, handling, and sampling of soil, water, and debris |
| | PCBs | Respirator with N95 or P95 filters combined with an Organic Vapor Cartridge | During excavation, handling, and sampling of PCB-contaminated soil, water, drums, and debris |
| ✓ | Silica | Respirator with N100 or P100 filter | During cutting or pulverizing concrete |
| | Lead dust or fume | Respirator with N100 or P100 filter | During hand scraping, chipping, wire brushing, torch cutting, and grinding surfaces with lead paint |

| Respiratory Protection by Contaminant | | | |
|---|---|---|---|
| Present (✓) | Contaminant | Minimum Respirator Type* | Source of Exposure |
| | Asbestos | Respirator with N100 or P100 filter | Friable asbestos-containing materials (ACM) |
| ✓ | Carbon monoxide | Supplied Air (SCBA or Airline) | Engine combustion byproduct in enclosed or confined spaces |
| ✓ | Volatile Organic Compounds (VOCs) | Respirator with activated carbon cartridges | BTEX Vapors from subsurface soil or groundwater released during intrusive activities |
| | Metal dust | Respirator with N95 or P95 filters | Settled dusts getting airborne, grinding metals or painted surfaces, Welding, or torch cutting |
| | Metal fumes | Respirator with N100 or P100 filters | Welding or torch cutting |

* Respirator types have Assigned Protection Factors (APFs) that limit the maximum airborne concentration in which they may be used. Also, the APF for a full-face air purifying respirator is limited to 10x the exposure limit when qualitative (smoke) fit testing is used. Subcontractors must select respiratory protection requirements in accordance APFs and fit testing methods.

### 2.5.8. Skin

If the possibility of skin contact with chemicals, lead, asbestos or other hazardous material exists, then protective clothing will be worn.

- **Tyvek®** (or equivalent) – PAH, silica, chromium, or other dry dust exposures
- **Tychem QC®** (poly-coated Tyvek®) or **Tychem SL®** (Saranex®) or equivalent – for liquid chemical exposures including contact with groundwater or saturated/dripping soils
- **Tychem SL®** (Saranex®) **with hood and boots** (or equivalent) – for use with SCBAs during emergency response involving chemical releases

### 2.5.9. PPE Summary

In general, PPE is divided into four broad categories as outlined below.

- **Level D PPE** – Minimum PPE for Level D includes hard Hat, safety glasses with side shield, safety shoes/boots, cut-resistant gloves, and high visibility vest. Additional PPE that may be required includes hearing protection, face shield, fall protection harness and lanyard, and Kevlar Chaps and Jacket (if using a chainsaw).
- **Modified Level D PPE** – Level D PPE plus protective clothing to prevent skin contact or contamination of support zone areas. Additional information on chemical protective clothing, chemical resistant gloves, and face shields is described in previous paragraphs of the PPE section of this HASP.

- **Full Modified Level D PPE** consists of Level D PPE plus coveralls, nitrile gloves (or equivalent), and boots or shoe covers. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. Full Modified Level D PPE is also required when handling corrosive chemicals.
- **Lightweight Modified Level D PPE** consists of nitrile gloves (or equivalent) and boots or boot covers. Lightweight Modified level D is necessary when minimal contact with contaminated materials in anticipated and contamination control must be maintained. Appropriate tasks for Lightweight Modified Level D PPE include equipment operators with minimal direct contact, surveyors, sampling technicians, inspectors, etc. The SSHC shall determine which is appropriate based on site conditions.

- **Level C PPE** – Modified Level D PPE plus air purifying respiratory protection. Additional information on respiratory protection is described in previous paragraphs of the PPE section of this HASP.
- **Level B PPE** – Modified Level D PPE plus supplied air respiratory protection. Level B PPE is not anticipated for this project.

The following table provides more specific initial PPE requirements for different tasks anticipated on this project based on HASP requirements. **When work assignments involved mixed tasks, choose the most conservative PPE or change PPE as required between different tasks.**

**Table 2.1 – PPE by Task**

| PPE level | Level D | | | | | | Mod Level D | | C |
|---|---|---|---|---|---|---|---|---|---|
| TASK | High Vis[1] | Head | Eye & Face | Foot | Hearing | Hand[2] | Hand[2] | Skin[3] | Resp |
| **Non-intrusive** | X | X | Glasses | X | When standing near heavy equipment | CR | | | |
| **Intrusive** | | X | Glasses | X | When standing near heavy equipment | | nDex & CR | Tyvek | Half Face with OV/N95 (optional or as needed based on air monitoring) |

**NOTES**

1. High visibility vests will not be required where persons are wearing Tyvek or Poly-Coated Tyvek
2. **CR** = cut resistant gloves, **HR** = heat resistant, **nitrile** = 3-5 mil nitrile gloves, **nDex®** = surgical nitrile
3. Tyvek and Poly Coat Tyvek include the use of boot covers or a boot wash to prevent the spread of contaminated materials to support zone areas and includes the use of nitrile surgical gloves (usually underneath cut-resistant gloves)
4. Energized electrical work required all PPE as required by NFPA 70E

## 2.6. HOUSEKEEPING

The Site shall be maintained in a clean and orderly condition at all times. Work areas shall be free of waste materials, debris, and rubbish to the extent that is feasible. Materials and equipment shall not obstruct traffic or emergency response activities. Waste materials, debris, and rubbish shall be removed **daily** from the Site and properly disposed off-site as required by Site conditions and activities. **All dumpsters must be covered to prevent stormwater intrusion.** Each subcontractor will have a **designated lay-down area** for the storage of their project materials. Unused tools and materials shall be **returned to laydown areas on a daily basis**. The

Contractor must approve all areas. It is the responsibility of the sub-contractor to maintain cleanliness of their area.

## 2.7. EXCAVATIONS

All excavations greater than five feet deep require completion of a *Soil Analysis Checklist* and *Daily Excavation Checklist* (ATTACHMENTS 5 AND 6) as outlined below. The Contractor and subcontractors will identify in safety plans or JSAs specific shoring systems or sloping/benching that will be used in specific areas. Excavations greater than four feet in depth are classified as a non-permit confined space unless contamination is encountered. Refer to the "Confined Space" section of this HASP for more guidance on how excavations will be handled with respect to confined space entry requirements.

- Assume soil is Type C unless soil testing indicates otherwise and such testing is documented on a Soil Analysis Checklist ***(Attachment 6)*** or approved alternate. Standard sloping and benching (per OSHA) will follow a 1:1.5 (V:H) cut-back associated with Type C soil.
- Shore excavations greater than five feet depth where personnel must enter and sloping is not feasible. Equipment used to shore excavations MUST follow OSHA shoring tables, or the subcontractor must have **tabulated data from the manufacturer on site.**
- If sections of trench are less than five feet and no cave-in hazard exists, then shoring is not required
- No workers may enter excavations until the designated Excavation Competent Person has inspected the excavations using the Daily Excavation Checklist ***(Attachment 7).*** Excavation inspections must be documented with documentation remaining on site for the full project duration and made available for Resident Engineer review.
- Qualified engineers will evaluate excavations that could affect the stability of adjacent structures
- A ladder or egress ramp will be provided within 25 feet of workers who must enter excavations
- Water will not be allowed to accumulate in trenches in a manner that will affect the integrity of excavation walls and shoring systems
- All spoils will be kept a minimum of two feet from the edge of the excavation
- Aluminum hydraulic (or equivalent) shoring or trench boxes will be used when necessary in lieu of sloping or benching. ***Manufacturer's tabulated data must be maintained on site by the Contractor and be made available for Resident Engineer review.***
- Fall Protection will be provided around excavations left open during off-hours. Fall protection will consist of solid barricades (saw horses or portable chain link) or soft barricades (safety fence) off-set 6' from the edge.
- Pedestrian Barricades

  Portable chain link fence (48 inches) or equivalent will be used to protect pedestrians. If pedestrian traffic is re-routed to avoid excavations, pedestrian detours must be accessible to bicyclists, handicapped persons, and other pedestrian in the area who may have special needs.

- Traffic Barricades
  - Any excavation activities that affect public or plant roads must be equipped with traffic safety devices as required by the Manual on Uniform Traffic Control Devices. If flaggers are used on public roads, they must receive DOT Flagger Training.
  - Any full or partial road closures will be coordinated with National Grid.
- Locate underground utilities and hand dig when within 3 feet of utility locations to make the final determination where the utility is located. Do not attempt to uncover utilities using excavator buckets or other heavy equipment.

***NOTE - The New York "Dig Safe" system must be notified by the Contractor 2 to14 days prior to excavation, boring, or drilling work. New York "Dig Safe" contact numbers are 811 or 800-962-7962.***

- Maintain clearance to overhead power lines in accordance with National Grid policies and specifications

## 2.8. CONFINED SPACE ENTRY

A **Confined Space Entry Permit** ***(Attachment 8)*** must be fully completed prior to entry of all permit-required confined spaces, if any. Confined spaces may be classified as non permit spaces if serious hazards have been eliminated and the classification process is documented. Documentation must remain on site for the full project duration and available for review.

Excavations (which are accessed by roads or ramps of sufficient grade to allow vehicles and personnel unrestricted access) are **not confined spaces** and are therefore not covered by confined space requirements. Excavations that lack access ramps or stairs and are accessed by ladder will be considered **non-permit** confined spaces unless there is a chemical spill or a potential for vapors to be released from contaminated soil or groundwater. If there is a chemical spill or contaminated soil or groundwater is encountered then the excavation will be treated as a **permit-required** confined space until air monitoring supports reclassifying to a non-permit confined space.

### 2.8.1. General Permit-Required Confined Space Entry Precautions

All persons entering manholes, tanks or similar permit-required confined spaces must have a body harness and lifeline attached. When vertical entry /exit is required at greater than four feet, a tripod and man-winch (or equivalent means of rescue) must be setup prior to entry. The standby person must be familiar with its operation. Rescue services (i.e., fire department) MUST also be available and notified of the entry. Standby persons shall NOT enter permit-required confined spaces to conduct rescue or first aid activities.

Respiratory protection and/or mechanical ventilation must be provided where hazardous atmospheres are identified or may develop during work activities. Action levels for oxygen, combustible vapors, hydrogen sulfide and carbon monoxide are outlined below and on the Confined Space Entry Permit.

- Oxygen – 19.5% to 23.5%
- LEL – 10%
- Carbon Monoxide – 35 ppm
- Hydrogen Sulfide – 10 ppm

### 2.8.2. Removal of Permit-Required Confined Space Entry Requirements

If confined spaces are reconfigured so that they are no longer confined, then **permit-required confined space entry procedure does not apply.** Examples include installing stairs or a ramp into pits and excavations and installing a man-door size opening in tanks.

### 2.8.3. Downgrade to a Non-Permit Confined Space

If all serious hazards can be eliminated, then a permit-required confined space can be reclassified as a non-permit confined space. As long as hazards are eliminated, a non-permit space is essentially treated like a normal work area subject to all other safety requirements. This must be done in accordance with the Confined Space Entry Program and requires at least initial air tests, documented on a permit before a confined space can be considered a non-permit space. The Contractor will propose reclassifying permit-required confined spaces and perform the necessary air testing and documentation.

### 2.8.4. Alternate Entry Approach

If the only actual or potential hazards in a confined space are atmospheric (oxygen, flammable vapors, toxic vapors, etc.) and a mechanical blower is sufficient to control them, then entry may be conducted under an **Alternate Entry** approach. Under this approach, no permit is required, no rescue equipment is necessary, no standby person is needed, and a rescue team is not required. However, the following confined space requirements remain in effect: Entrants must be trained; initial air tests must be taken; and the blower must remain operating throughout entry.

## 2.9. HOT WORK

***NOTE – Hot work is not anticipated at this time. However, the Contractor is expected to implement fire prevention and protection programs (including Hot Work Permits) in accordance with National Grid policies and specifications if necessary.***

Hot work includes any activities that generate an open flame, arc, **or sparks** and includes the use of **temporary heaters (salamanders).** Hot work is anticipated and will typically include welding, cutting, soldering, and grinding.

Specific hot work requirements will be identified on the Hot Work Permit but will generally include the following:

- Print the names of all persons performing hot work on the permit. Only persons listed may perform hot work as authorized by the permit.
- Print the name of the fire watch on the permit. Changes in fire watch persons must immediately be noted on the permit. Fire watches are responsible for inspecting the site for evidence of fire or fire hazards associated with hot work activities.
- Continue fire watch activities for **30 minutes** after hot work activities have stopped if required on the **Hot Work Permit** ***(Attachment 9)***
- All combustible material must be removed from the hot work area when possible or protected from sparks and slag when located within **35 feet** of hot work
- At least one **20lb Type ABC fire extinguisher** must be in possession of each individual identified as a fire watch
- All heavy equipment must be equipped with at least a **5 lb fire extinguisher** that is secured to prevent movement while equipment is in operation
- All hot work areas shall be specified on the Hot Work Permit. Hot work shall NOT be conducted in additional areas without first notifying Resident Engineer and the Hot Work Permit is modified or a new permit is issued
- Additional fire safety precautions may be specified on the permit and must also be implemented by site personnel

## 2.10. FIRE PROTECTION & PREVENTION

Hot Work Permits, Contractor and subcontractor safety plans, and JSAs may supplement basic fire safety requirements outlined below by establishing specific requirements throughout the course of the project as needed to ensure that personnel and property are adequately protected from potential fires. Emergency response associated with fires is covered in the Emergency Response section of this HASP.

Basic fire protection requirements include:

- Construction heaters or other forms of heat generating equipment may only be used by the Contractor and subcontractors with prior approval from Resident Engineer and a Hot Work Permit is obtained
- Fire protection water, pull stations, alarms, and strobes should be the last utilities and services to be shut down when complete isolation from utilities is necessary to support demolition, construction, or remediation activities
- Where applicable, fire protection systems must not be obstructed, shut-off nor left inactive at the end of a working day or shift without notification of and authorization from National Grid and the site owner
- Where applicable, sprinkler systems must be kept at **41˚F** or higher
- Fire hydrants and standpipes may only be used for firefighting purposes unless other use is authorized by National Grid and the site owner
- Fire hydrants and valves must not be obstructed or blocked. At least a **6-foot** clearance must be maintained on all sides for emergency access
- Contractor and subcontractors **must inspect extinguishers monthly** in addition to annual service provided by an extinguisher service company. Inspections and testing must be documented on **weather-resistant tags or labels** attached to each fire extinguisher.

## 2.11. LOCK OUT/TAG OUT

All persons exposed to potential injury from the unexpected energizing of system components must perform work under a lockout/tagout (LOTO) program with his or her own lock(s) in place. **No individuals may work under another individual's lock.** Lockout/Tagout must be conducted in accordance with the Contractor LOTO Procedure.

General LOTO requirements include the following:

- The Contractor will identify lockout boundaries and operate necessary valves, breakers, etc.
- The Contractor will ensure pumps, fans, and other equipment are in a safe condition and piping is purged and blanked when necessary
- The Contractor (or designated subcontractor) shall keep a list of locks and tags placed on each equipment or system that is locked out. An **Equipment-Specific LOTO form** ***(Attachment 10)*** or equivalent
- Contractor LOTO tags must show diagonal red and white stripes unless the site owner requires a different tag
- Keys to all locks will be placed in a lock box
- **Each person working on a system or equipment that is locked out must place his or her lock and tag on the lock box**
- Locks and tags must be removed from lock boxes at the end of each shift

## 2.12. ELECTRICAL SAFETY AND ENERGIZED WORK

***NOTE – Qualified Electrical Workers who are performing authorized energized electrical work are prohibited from opening equipment enclosures that may expose Contractor and oversight personnel and other unqualified personnel to potentially energized and exposed conductors > 50 volts or allowing unqualified personnel to approach closer than 4' to such conductors.***

This section outlines basic electrical safety requirements related to cords and power tools, utilities, and energized electrical work.

### 2.12.1. Cords and Electrically-Powered Tools

All extension cords and power tool cords must be in good condition with no cuts through the outer insulation and the ground plug (if equipped) installed. Double-insulated tools do not require a ground plug. All tools must have safety guards installed. Users must inspect tools daily. Defective tools shall not be used and the Contractor shall be solely responsible for associated project delays and costs if a tool is not allowed to be used. All equipment stored in gang and toolboxes are subject to inspection.

Cords may not be run through doors or windows without being protected. Cords must not be run across walkways and stairs. Cords will either be taped to the floor, run at least 7.5' overhead or equivalent measures implemented to minimize tripping hazards, cord damage, and maintain housekeeping. Cords may not be run through standing water. GFIs are required on all extension cords and 120v hand tools and equipment.

### 2.12.2. Buried Utilities & Overhead Power Lines

***NOTE –Contractors will comply with National Grid policies and specifications at a minimum.***

All subsurface work including site grading, excavating, and drilling requires notification of the local dig-safe organization. Hand-dig when within 3' of the anticipated location of underground utilities.

Assume all overhead power lines are energized. A 20' clearance policy to overhead power lines is required on this site. If work must be conducted at less than 20' but NOT less than the OSHA minimum clearance of 10', then additional safety requirements apply and will be identified in the Pre-Work JSA for that work. Additional precautions will include one or more of the following:

- Call the local utility to get the voltage and ask if lines can be de-energized or insulated/sleeved.
- Dedicated spotter
- Don-conductive distance markers or devices to delineate the 10' and/or 20' clearances

### 2.12.3. Energized Electrical Work

***NOTE –Individuals not specifically trained for energized electrical work are not authorized to approach closer than 4' to any open energized electrical cabinet or other exposed energized conductors less than or equal to 600 volts. The distance is extended to 10' for higher voltages unless a different distance has been specified by a Qualified Electrical Worker.***

All work that can be conducted in a de-energized electrically safe condition must be performed under LOTO. Electrical work that cannot be performed in a de-energized state and involves exposure to unprotected conductors >50 volts, must be performed in accordance with NFPA 70E standard on arc flash using an **"Energized Electrical Work Permit"** ***(Attachment 11 or equivalent)*** and program. The Contractor and Subcontractors will complete permits and keep expired permits on site for review by Resident Engineer at any time during the project. Energized electrical work must be identified in Contractor and subcontractor safety plans or JSAs, and Resident Engineer must be notified prior to all energized electrical work. **Energized electrical work may only be conducted by qualified persons who have submitted evidence of NFPA 70E training and FA/CPR training to Resident Engineer.**

## 2.13. FALL PROTECTION

OSHA-approved methods of fall protection are required under the following conditions:

- An employee is working **6 six feet** or more above the ground
- An employee is working on scaffolding without a **42-inch** railing protection

- An employee is working in a manlift or scissors lift more than **six feet** above the ground
- An employee is involved in assembly/disassembly of scaffolds, work platforms or temporary surfaces working **6 feet** or more above the ground
- An employee is working over dangerous equipment/conditions (at any height)
- An employee is working on a walking/working surface or roof and is **within 15 feet unprotected edge or floor opening/hole** that will expose the employee to a fall greater than six feet

Fall protection that uses a harness and lanyard must be a Class III safety harness and be secured to an anchor point that can withstand 5,000 lbs of force. Other methods to prevent falls include temporary guardrails, installation of hole covers, warning lines (15' from the edge), fall restraint lines, safe use of ladders, and safe use of manlifts.

## 2.14. SCAFFOLDS

***NOTE –If the Contractor or subcontractors build and use scaffolds, then requirements in this section apply.***

All scaffolding used on this project will meet the requirements established in OSHA 29 CFR 1926.451. Each contractor using scaffolds must designate a scaffolding competent person to direct and supervise the erection and dismantling of all scaffolding on this project. The competent person will sign and attach one of the following color-coded scaffold tags to each scaffold:

- **Green Tag:** Scaffolding complete and ready for use
- **Red Tag:** Scaffolding incomplete and not for use
- **Yellow Tag:** Scaffolding usable but personal fall protection or other restrictions will be required

Scaffolding will be inspected daily by the Scaffolding Competent Person designated in writing by the subcontractor prior to use and sign the tag at the time of inspection. When scaffolds are removed from service (i.e., not being used) the scaffold competent person shall remove old/expired green tags. Users shall not use any red-tagged scaffold or any scaffold without a green or yellow inspection tag.

## 2.15. HEAVY EQUIPMENT & TEMPORARY FUEL AREAS

***NOTE –Personnel working near heavy equipment will be exposed to "struck-by" injuries and "crush" injuries if caught between heavy equipment (or counterweights) and a fixed object. Personnel must make eye contact and receive and "OK" signal from equipment operators prior to passing through vehicle blind spots (rear) or across anticipated travel route. Do not linger in vehicle blind spots. The requirements in this section apply to all heavy equipment mobilized to the site. Contractor and subcontractors are responsible for complying with similar National Grid requirements.***

**All equipment must be secured after hours.** Keys must be removed from equipment and secured away from the equipment. Mobile equipment that does not require an ignition key shall be disabled. All vehicles and heavy equipment must be turned off when left unattended.

**The Contractor and Subcontractors shall submit a letter on company letterhead that designates which of their employees is competent and authorized to operate each type of equipment** present on this project. Forklift and lull operators must have a license or certificate that indicates they have passed a written test and "road" test for the type of forklift they will be operating.

Operators will use seatbelts if so equipped. Heavy equipment will be equipped with **overhead and rollover protection** whenever feasible. Operators will **inspect equipment daily** for leaks, damage, and other necessary repairs.

Heavy equipment must be equipped with **backup alarms, horns, and other safety devices** installed by the manufacturer. Vehicles operated at night must have headlights, tail lamps, and reflectors. Safety devices must not be disabled.

Temporary fuel storage tanks will be labeled as to their content and be protected from collision by site vehicles using solid barricades including balusters, chain link fence, or equivalent. **Spill kit** (55 gallon sorbent capacity contained in an overpack) and one **20lb Type ABC fire extinguisher** will be located within **45 feet** of fueling areas. Tanks will be rated for above ground use and provided with secondary containment. Tanks and dispensing hose will be bonded and grounded. **Temporary secondary containment must be provided in the refueling area that includes the storage tank and dispensing hoses.**

## 2.16. CRANES & RIGGING

***NOTE –Crane use by the Contractor is anticipated for this project including placement of excavation support systems. The Contactor must comply with similar National Grid policies and specifications.***

Mobile cranes will be operated in strict accordance with OSHA 29 CFR 1926.550 and ANSI B 30.5.

### 2.16.1. Crane Inspections

No cranes will be brought onto the project without a current annual inspection by a qualified third party and applicable load charts. A copy of the current annual inspection will remain in the crane at all times. Crane operators will perform daily and monthly crane safety inspections. Inspections must be documented on the daily and monthly crane inspection checklists. Crane operators are to turn the crane inspection checklists into their supervisor daily.

### 2.16.2. Operator Qualifications

Operators must have a valid Crane Operator and Hoisting License.

### 2.16.3. Rigger Qualifications

Qualified riggers will rig material or equipment lifted by a crane and will be designated as "Qualified Riggers" by their employer on company letter submitted to Contractor with copy provided to the Resident Engineer.

### 2.16.4. Rigging Practices

Hooks will be equipped with safety latches. Moused and/or cargo/shakeout hooks will not be allowed. All cranes will be equipped with anti-two block devices on both the load and whip lines. All rigging equipment and spreader bars shall have a manufacturer's tag or otherwise marked noting its safe working load. Rigging equipment and spreader bars not tagged or marked will be immediately removed from the project. All rigging will be inspected daily before each shift by the qualified rigger. Qualified Rigger(s) responsible for rigging inspections will be identified in writing the JSA and/or O'Brien & Gere *Lifting & Rigging Plan* (Appendix B). Subcontractors that will be required to lift any material or equipment by crane or other lifting equipment will designate a qualified person(s) to monitor all rigging.

The following equipment is covered by requirements in this section of the HASP: cranes, hoists, lulls, and forklifts. Lulls and forklifts are only covered when they are used to lift materials using rigging equipment (chains, slings, wire rope, etc.) as opposed to lifting materials that are properly placed on the forks.

All rigging must meet the following requirements:

- Be inspected prior to each use by a competent, qualified, and designated employee.
- All rigging must have tags that are legible with the allowable load ratings listed.
- Rigging must be of the proper type and size for the load being moved.

Straps etc. may not be attached directly to forks of a loader/forklift/ or Lull.

### 2.16.5. Critical Lifts

All critical lifts require a **Lifting & Rigging Plan** ***(Appendix B)***. Critical lifts include the following:

- Any lift that exceeds (or potentially exceed) 80% of the rated capacity of the equipment
- Any lifts near overhead power lines
- Any lifts over production/process equipment that could result in chemical spills, product contamination, or other major loss
- Any lifts over buildings that will be occupied or partially occupied
- Any lifts of custom or long-lead time equipment

## 2.17. DEMOLITION SAFETY REQUIREMENTS

### 2.17.1. Utilities

When working under or adjacent to overhead utility lines or equipment, the Contractor will notify the proper utility companies (power, telephone, etc.,) at least 72-hours in advance of starting work. The utilities shall be protected in the manner prescribed by the utility company. The date and the name of the utility contact person shall be provided in writing to National Grid and Resident Engineer.

Use the following minimum clearances from utility lines when operating cranes, derricks and other construction equipment: 1) Line voltage below 50 kV – 10 feet. 2) 50 kV and higher – 10 feet plus 0.4 inches for each 1 kV above 50 kV. If possible, have the overhead utility line companies tag overhead lines for better visibility. In addition to these requirements, a spotter shall be utilized to assist the equipment operator in maintaining safe distances and heavy equipment working near or under overhead lines will be properly grounded

When working in the vicinity of underground utilities, all underground utilities in the area will be located and marked prior to any excavation operation. Prior to the start of intrusive activities, DigSafe New York shall be contacted and the date of the call and ticket number shall be provided in writing to National Grid and Resident Engineer.

### 2.17.2. Pre-weakening of Structures or Temporary Supporting Structures

Installation of any temporary supporting structures or pre-weakening prior to actual demolition is not anticipated.

### 2.17.3. Demolition Safeguards to Site Personnel and the Public

- **Barricades** – All structures to be demolished will be surrounded by a barricade or other markings that encompasses sufficient "buffer zone" to prevent site personnel from being struck by collapsing structures or flying debris. If necessary, solid barriers (such as plywood or tarps) will be used to contain flying debris. Barricades will be sufficiently sturdy and meet at least the stanchion requirements specified by OSHA for warning lines used in fall protection. These requirements include withstanding 16 pounds of lateral force and spaced so that warning lines are between 34" and 39" in height. Barricades that are left in vehicle or pedestrian traffic areas overnight must be equipped with flashers or reflective surfaces.

- **Signs** – Warning signs will be posted on all sides of the demolition to alert site personnel and the public of the demolition hazards. Signs shall be OSHA-type "danger" signs of steel or aluminum and approximately 10"x14" in size. Demolition area signs shall state the following or an acceptable alternate:
- **Restricted access** – Only essential personnel necessary to operate heavy equipment remove debris, and other necessary demolition activities will be allowed to enter demolition areas during demolition activities. Other ("non-essential") personnel will be required to observe from outside barricaded areas. If inspections or other activities are required by "non-essential" personnel during demolition, then demolition activities will temporarily cease and such personnel may enter demolition areas ONLY when the subcontractor Demolition Competent Person has determined that there is no danger of an unplanned collapse.
- **Heavy equipment safety** – All operators will be competent in the operation of heavy equipment. The operator's employer will identify heavy equipment operators who are authorized to operate heavy equipment on this project in writing on company letterhead and submit to Resident Engineer prior to work. All heavy equipment shall be equipped with overhead protection, backup alarms, seatbelts and an enclosed cab.

### 2.17.4. Traffic Control

Contractor will be responsible for coordinating with local authorities and closing appropriate roads when necessary. Detour signs will be placed to direct traffic around the area. Notification to close roads will need to be made to Resident Engineer and National Grid with at least 3 days prior notice to coordinate with local authorities. Barricades with adequate flashers or reflective surfaces are required for normal pedestrian and road traffic areas that are barricaded overnight.

### 2.17.5. Debris/ Material Staging

Contractor and subcontractors will be responsible for storing their materials and debris in a safe and secure area. Resident Engineer and National Grid must approve all laydown areas prior to dumping debris or staging materials. Material that is classified as "contaminated" or is awaiting testing will be staged on poly sheeting or other impervious surface to prevent contamination of the underlying ground surface.

### 2.17.6. Hauler Loading

Contractor and subcontractors will be responsible for loading and unloading of their heavy equipment in a safe and secure area. Resident Engineer must approve the location to load/unload heavy equipment.

## 2.18. DRILLING/BORING

The primary hazards associated with drilling/boring activities are associated with the use of the rig and supporting vehicles.

### 2.18.1. Crew Qualifications

All personnel performing drilling/boring work must possess required state or local licenses to perform such work. The drilling/boring foreman, superintendent, or crew leader (hereafter referred to as "drilling foreman") shall have experience with the drilling/boring equipment used on site and is designated as the "competent person" for drilling/boring activities. The drilling foreman is responsible for the safe operation of the rig as well as the crew's adherence to safe drilling/boring practice.

### 2.18.2. Rig Inspection

Daily rig inspections are required prior to performing boring/drilling activities. The inspection shall include the following items as a minimum.

- Vehicle condition
- Proper storage of equipment
- Condition of all wire rope
- Condition and location of all safety equipment (fire extinguisher, first aid kit, spill supplies, etc.)
- Leaks (fuel, oil, hydraulic fluid)

### 2.18.3. Rig Setup

The drilling foreman must inspect all drilling/boring locations prior to moving the rig in place to ensure a stable surface exists. Special attention must be paid to soft, unstable terrain. The rig shall be properly blocked and leveled prior to operations. Blocking provides a more stable drilling surface by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur that may ultimately result in rig collapse/turnover. At a minimum, proper blocking shall consist of wooden blocks at least 24" by 24" and 4" to 8" thick (or equivalent) that are placed between the jack swivels and the ground. Sufficient clearance to overhead power lines shall be maintained as outlined in the electrical safety sections of this HASP.

### 2.18.4. Preparation for Drilling/Boring Activities

Before drilling, the existence and location of underground utilities must be determined. The underground utilities will be located and identified by contacting the Underground Facilities Protection Organization (UFPO) when on public property, reviewing available drawings, and working with facility personnel familiar with site utilities. Utility locating services (ground penetrating radar or equivalent) may be necessary when little information is available on the location of utilities that may be present. "Soft dig" (e.g., vacuum) technologies may also be used to physically locate utilities prior to drilling/boring.

The Contractor will meet utility representatives and/or locators on site prior to marking out underground utilities. Contractor Project Field Supervisor will provide the utility representatives and/or locators with a drawing that shows the proposed drilling/boring locations. The Contractor Project Field Supervisor will then conduct a physical site walk-through with utility representatives and/or locators to visually identify each location where drilling/boring activities are to be conducted. The Contractor Project Site Supervisor will document the site walkthrough in a field log book or equivalent. Documentation that utilities have been located and marked shall be maintained on Site.

### 2.18.5. Drilling/Boring Safe Work Practices

No ignition sources (or hot work) are permitted if flammable vapors reach 10% of LEL in the immediate area (one foot radius) of the point of drilling. Combustible gas readings will be made in the general work area when flammable vapors at one foot from the point of drilling/boring reach 10% LEL.

Personnel shall NOT ride the travelling block or elevators nor will the catline be used to hoist personnel.

At the end of each work day, equipment will be moved to a location away from overhead power lines.

The rig shall not be moved while the mast is erected.

Workers should never stand near the borehole whenever any wire line device is being run.

### 2.18.6. Wire Rope

The drilling/boring foreman must remove wire rope from service when inspections reveal two wires are broken or corrosion is found adjacent to a socket or end fitting. Special attention shall be given to the inspection of end fittings on boom supports, pendants, and guy ropes.

Wire ropes removed from service must be clearly marked as being removed from service.

Wire rope clips attached with U-bolts shall have U-bolts on the dead or short end of the rope. Clip nuts shall be periodically checked for tightness.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip. The clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads shall consist of one continuous piece without knots or splices.

An eye splice in any wire rope shall have not less than five full tucks.

Wire rope shall not be secured by knots except on haul back lines on scrapers.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by clips or knots.

Wire rope clips shall not be used to splice wire rope.

### 2.18.7. Pipe/ Auger Handling

Pipe and auger sections exceeding 75 pounds shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

The drilling/boring foreman must instruct site personnel to never try to stop rolling pipe or casing. Site personnel should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift pipe and move slips. The drilling/boring crew should not be permitted to kick slips into position.

When pipe is being hoisted into position, site personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks, or on flatbed trucks should be chocked or otherwise secured to prevent rolling.

## 2.19. HAZARD COMMUNICATION & MSDS

***NOTE –It is anticipated that Contractor and subcontractors may mobilize limited quantities of "Bulk" chemicals that will primarily include oil, hydraulic fluid, lubricants and similar products necessary to maintain equipment. Bulk chemicals also include construction water treatment chemicals or fuels stored within heavy equipment and (potentially) within a temporary fuel tank. MSDS will be retained in Contractor's field office.***

Contractor and subcontractors must submit **MSDSs** to the Resident Engineer for all chemicals/materials that will be used on this project and **indicate the maximum quantity on site**. The types and quantities of chemicals brought on site (even for temporary use) may trigger various environmental regulations and reporting requirements. A copy of all MSDSs for materials brought on site will be filed in the Contractor office trailer.

**Project personnel must remove chemicals/materials that will not be used on this project from their vehicles, trucks, storage boxes, and tool boxes. All subcontractors are expected to avoid bringing ANY unnecessary chemicals on site.** All chemical containers require a label that meets Hazard Communication requirements. Manufacturer's labels are generally acceptable as long as they are legible. **Prior to storing any quantities (greater than 55 gallons) of liquid material in a single container on the site, subcontractors**

**shall provide secondary containment surrounding such containers equal to the volume of the largest single container plus six inch freeboard.**

MSDS sheets shall be obtained from all suppliers of paints, coatings, adhesives, grout, caulk, lubricants, welding products, solvents, insulation, and similar products. MSDS must be requested from vendors for materials procured for the current project or obtained by using an Internet search service (e.g., Google, Yahoo, etc.) and type "MSDS <chemical name>". ***Contractor and subcontractors must submit MSDS to the Contractor for all hazardous materials brought on site. The Contractor must submit MSDS to Resident Engineer and National Grid.***

## 2.20. SAFETY AUDITS

The Contractor will conduct written weekly safety audits that are documented using a safety audit checklist. The subcontractors, Resident Engineer, and National Grid representatives may also participate in safety audits. Additionally, **National Grid may audit the site at any time** and may require access to all Contractor and subcontractor EHS files. A variety of checklists are available with one ***Safety Audit Checklist*** (ATTACHMENT 11) attached to this HASP.

## 2.21. GENERAL WORKER SAFETY RULES

Workers follow the established safety practices for their respective tasks. The need to exercise caution in the performance of work is made more acute due to weather conditions and restrictions in mobility, peripheral vision, and communication caused by the personal protective equipment.

To enhance site safety, the following General Worker Safety procedures have been established:

- **Smoking is not permitted in work areas, smoking is allowed in designated areas only**
- **Eating, drinking, chewing gum, chewing tobacco and application of cosmetics in exclusion and contamination reduction zones are prohibited**
- **No firearms may be brought on site**
- Employ the buddy system when appropriate. Be alert.
- Minimize contact with contaminated materials
- Avoid breathing chemical odors
- Do not expose skin to water, chemicals, or soil. If one becomes dirty or wet with contaminated fluids, clean up immediately using plenty of water.
- Hands must be washed before eating or drinking and after using toilets
- Consumption of alcohol or intoxication (under the influence or impaired) during work hours or while on site is prohibited
- Working when ill is prohibited

# 3 CHEMICAL PARAMETERS OF CONCERN

The OSHA HAZWOPER standards (29CFR1910.120 and 1926.65) and OSHA Hazard Communication Standard require that site personnel, subcontractors, and visitors must be informed of chemical hazards associated with their work area. Health hazard information for site chemical hazards is summarized below and in ***Table 3.1*** of this HASP. Health and safety information in this HASP is intended to supplement Hazard Com training previously provided to site workers by his or her employers.

## 3.1. EXPOSURE PATHWAYS

Possible exposure pathways are:

- Inhalation of vapors released from contaminated soil and/or water
- Inhalation of contaminated dusts
- Accidental ingestion of contaminants
- Skin contact/absorption with contaminated soils and/or water
- Injection through punctures and lacerations

Based upon anticipated site activities and prudent safety and hygiene practices during site work, ingestion of site contaminants is unlikely. Hazardous skin contact or absorption by the various contaminants is also unlikely because of the low concentrations that are anticipated and/or the use of personal protective equipment (PPE). The primary route of exposure is inhalation of airborne contaminants and contaminated dusts. However, inhalation of airborne contaminants approaching the OSHA PELs is unlikely because of natural ventilation of the work area, safe work practices, PPE, and/or air monitoring.

Confined spaces, such as inside tanks and deep excavations (>4 feet), represent special exposure considerations because of the reduced natural ventilation and restricted means of egress. Special procedures will be used to prevent injury and overexposure in confined spaces.

## 3.2. CHEMICAL HAZARDS SUMMARY

***Previous site investigations indicate that soil and groundwater may contain volatile and semi-volatile organic compounds which could contribute to airborne Volatile Organic Compounds (VOCs) or odor.***

The following paragraphs summarize the health effects of site contaminants that are frequently of concern and other site chemicals (if any). Site chemicals are usually those chemicals used during water or wastewater treatment, petroleum products (fuel), and potentially lubricants such as hydraulic fluids. This HASP focuses on those which are believed to have the potential to pose a significant health hazard to site personnel based on their potential to become airborne, concentrations in soil and groundwater, and their toxicity and other hazardous characteristics. ***Table 3.1*** – "Summary of Potential Health Effects" also includes information on exposure limits and key physical characteristics such as flammability.

» **Nuisance Dust** – Nuisance Dust can be a problem at any construction or remediation site. Although not especially hazardous, dust should be controlled to the extent feasible to prevent the public from being unnecessarily concerned and to further reduce the nuisance dust hazard to site personnel. Nuisance dust can be controlled by utilizing dust suppression techniques discussed in this HASP. The primary effect of nuisance dust is irritation of the eyes, nose, and throat when concentrations approach the OSHA exposure limits of 5 mg/m3 (respirable). As always, visible dust leaving the site is not acceptable.

- **Silica** – Crystalline silica has been classified as a human lung carcinogen. Additionally, breathing crystalline silica dust can cause silicosis, which in severe cases can be disabling, or even fatal. The respirable silica dust enters the lungs and causes the formation of scar tissue, thus reducing the lungs' ability to take in oxygen. There is no cure for silicosis. Since silicosis affects lung function, it makes one more susceptible to lung infections like tuberculosis. In addition, smoking causes lung damage and adds to the damage caused by breathing silica dust. Exposure occurs during many different construction activities. The most severe exposures generally occur during abrasive blasting with sand to remove paint and rust from bridges, tanks, concrete structures, and other surfaces. Other construction activities that may result in severe exposure include: jack hammering, rock/well drilling, concrete mixing, concrete drilling, brick and concrete block cutting and sawing, tuck pointing, and tunneling operations.

- **Volatile Organic Compounds** (VOCs) – VOCs of concern that were identified during previous studies include BTEX compounds (benzene, toluene, ethylbenzene, and xylene). Toxicological effects for selected VOCs are summarized below. Additional information on selected compounds that were detected is presented in Table 3.1 along with their Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs).

  Most VOCs have distinctive odors and cause irritation of eyes and upper respiratory tract. These symptoms will probably be the first indication by workers that they may be exposed to potentially unsafe contaminant concentrations. Most VOCs also cause skin irritation that is another common symptom of exposure. Prolonged exposure to high concentrations above OSHA PELs may affect the nervous system causing symptoms similar to alcohol intoxication. Although the duration of this project is comparatively short, chronic effects of long-term VOC exposure may include kidney and liver damage. Benzene is a known human carcinogen.

- **Polycyclic Aromatic Hydrocarbons** (PAHs) –PAHs were detected during previous studies and may be present. PAHs are semi-volatile organic compounds that do not readily evaporate. As a result of their low volatility, exposure to these compounds will result from airborne dusts contaminated with PAHs. Short-term (acute) effects of exposure to these compounds are the same as those associated with exposure to dusts in general and may include eye and upper respiratory tract irritation at high dust levels. High dust levels are characterized by dust levels where visible dust emissions are observed that typically obscure vision. The primary health effect associated with PAHs is cancer as a result of long-term (chronic) exposure. Several PAHs are suspected as being potential human carcinogens. Additional information on PAHs is presented on Table 3.1 including information on Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs).

- **Cyanide (Salts/Compounds other than Hydrogen Cyanide)** – Cyanide salts and compounds other than hydrogen cyanide can damage the tissues of the eyes, skin, respiratory tract and the oral and gastrointestinal tract. Cyanides poison the vital organs of the body (for example the lungs and heart) including areas of the brain that regulate proper functioning of those organs. Exposure may result in convulsions, unconsciousness and in death.

## Table 3.1 – Summary of Potential Health Effects

| Chemical | Location | PEL | IDLH | Characteristics | Routes of Exposure | Symptoms of Exposure & Health Effects |
|---|---|---|---|---|---|---|
| **SEMI-VOLATILES – may include a mixture of the following** | | | | | | |
| **Polycyclic Aromatic Hydrocarbons (PAH)**<br><br>**Also known as:** PNAH Polynuclear aromatic hydrocarbons | Excavations | 0.2 $mg/m^3$ (Coal tar pitch volatiles - benzene soluble fraction)<br><br>0.15 $mg/m^3$ (Coke Oven Emissions - benzene soluble fraction) | Not determined | PAHs do not readily evaporate.<br>Exposure from contaminated soil/dust created during remediation activities<br>Pure material is a brown/black tar-like substance | Inhalation<br>Contact | High exposures (>PEL) may cause irritation of the respiratory system<br>The skin and eyes are especially prone to irritation from contact with PAHs<br>May cause photosensitization of the skin and eyes increasing the potential for sunburn and irritation<br>Long-term exposure may cause skin, lung, and kidney cancer |
| **METALS & MINERALS** | | | | | | |
| **Silica** | Cutting or pulverizing concrete | 0.05 $mg/m^3$ (NIOSH) | 50 $mg/m^3$ (quartz) | Colorless, odorless solid<br>A component of sand, concrete and other masonry materials | Inhalation | Cough, dyspnea (breathing difficulty), wheezing<br>Decreased pulmonary function, progressive resp symptoms (silicosis)<br>Irritation to the eyes<br>Potential occupational carcinogen |
| **VOLATILE ORGANIC COMPOUNDS (VOCs) – may include a mixture of the following** | | | | | | |
| **Benzene** | Soils, groundwater | 1 ppm TWA<br>5 ppm STEL | 500 ppm | Colorless vapor released from contaminated soil or water that may have a strong, irritating, or otherwise characteristic odor generally detectable at 4-5 ppm<br>Ionization Potential = 9.24 eV | Inhalation<br>Absorption<br>Contact | Irritation to the eyes, nose, and throat<br>Dizziness<br>Dermatitis<br>Prolonged exposure to hazardous levels may damage blood-forming systems<br>Benzene is also a suspected human carcinogen (ACGIH 1996 Class A2) |
| **Toluene** | Soils, groundwater | 200 ppm<br>300 ppm Ceiling | 500 ppm | Colorless liquid with a sweet benzene-like odor<br>UEL=7.1% and LEL=1.1%<br>Class IB Flammable Liquid<br>Ionization Potential=8.82 eV | Inhalation<br>Contact (dermatitis) | Irritation to eyes and nose<br>May cause skin irritation/dermatitis and headaches<br>Exposures at or above the OSHA PEL may cause fatigue, confusion, dizziness and overall depression of central nervous system<br>Chronic exposure or high exposures approaching IDLH levels may cause liver and kidney damage |
| **Xylene (o,m,p)** | Soils, groundwater | 100 ppm | 900 ppm | Colorless liquid with an aromatic odor<br>UEL=6.7%-7.0% and LEL=0.9%-1.1%<br>Class IC Flammable Liquid<br>Ionization Potential = 8.56 eV | Inhalation<br>Contact (dermatitis) | Irritation to eyes, nose, and throat<br>May cause skin irritation/dermatitis and headaches<br>Exposures at or above the OSHA PEL may cause fatigue, confusion, dizziness, nausea, vomiting, cornea (eye) damage, and overall depression of central nervous system<br>Chronic exposure or high exposures approaching IDLH levels may cause liver |

## Table 3.1 – Summary of Potential Health Effects

| Chemical | Location | PEL | IDLH | Characteristics | Routes of Exposure | Symptoms of Exposure & Health Effects |
|---|---|---|---|---|---|---|
| | | | | | | and kidney damage |
| **Ethylbenzene** | Soils, groundwater | 100 ppm Ceiling (Max) [skin] | 700 ppm | Colorless to yellow, oily liquid with a sweet, floral odor<br>UEL=6.8% and LEL=0.9%<br>Class IC Flammable Liquid<br>Ionization Potential = 8.40 eV | Inhalation<br>Contact (dermatitis)<br>Absorption | Irritation to eyes, nose, and throat<br>May cause skin irritation/dermatitis and headaches<br>Exposures at or above the OSHA PEL may cause lassitude (weakness, exhaustion), dizziness, confusion, malaise (vague feeling of discomfort), drowsiness, unsteady gait; narcosis<br>Chronic exposure or high exposures approaching IDLH levels may cause damage to the liver or reproductive system. |
| **OTHER** | | | | | | |
| **Nuisance Dust** | soil | 5 mg/m$^3$ (respirable)<br>15 mg/m$^3$ (total) | NA | General airborne dust generated from vehicle traffic on site roads, excavation work, and other site activities | Inhalation | Potential irritation to the eyes and upper respiratory system |
| **Cyanide (Salts and compounds other than hydrogen cyanide gas)** | soil or groundwater | 5 mg/m$^3$ [skin] | 25 mg/m$^3$ | White, granular or crystalline solid with a faint, almond-like odor | Inhalation<br>Contact<br>Absorption | Irritation to the respiratory system<br>Exposures at or above the OSHA PEL may cause lassitude (weakness, exhaustion), headache, confusion; nausea, vomiting; increased resp rate<br>Chronic exposures may lead to thyroid, blood, or central nervous system disorders.<br>High exposures approaching IDLH levels may cause central nervous system damage and asphyxiation by inhibiting cellular respiration. |
| **Footnotes** | All values are 8-hour time-weighted averages (TWAs) unless otherwise indicated<br>**PEL**: Permissible Exposure Limit, the concentration an employee may be exposed to for an 8-hour work day for a 40 hour work week for which nearly all employees may be repeatedly exposed without adverse health effects<br>**REL**: NIOSH recommended exposure limit for full-shift exposures<br>**STEL**: Short-Term Exposure Limit as a 15 minute average<br>**CEILING:** maximum concentration<br>**IDLH**: IMMEDIATELY Dangerous to Life and Health, contaminant concentration which present the possibility for severe health consequences if exposed to the IDLH concentration without the appropriate personal protective equipment (PPE)<br>**LEL**: Lower Explosive Limit<br>**Units: mg / m$^3$** = milligrams per cubic meter of air \| **f / cc** = fibers per cubic centimeter of air | | | | | |

## 4 HAZARD EVALUATION

The OSHA safety regulations (29CFR1910 and 29CFR1926) require that site personnel, subcontractors, and visitors must be informed of the hazards associated with their work activities. Hazard Identification and control begins during safety planning. Safety planning is required for work on this project and occurs at different times during the project. Each "level" of safety planning typically has differing degrees of detail and focus. However, the ultimate objective is that site management and crafts methodically evaluate hazards and implement safety controls to prevent the occurrence of an injury, fire, explosion, spill, or property damage incident and are able to manage changes as they occur. The following flow chart provides an overview of safety planning requirements and tools outlined in previous sections of this HASP.

Safety Plans, JSAs, and Safe Work Permits developed subsequent to this HASP by Contractor or subcontractors (if any) will identify hazard controls that are consistent with this Health & Safety Plan. The Contractor and subcontractors may use the Pre-Work JSA template ***(Appendix A)*** or request approval from Resident Engineer to use an alternate JSA template. **Submitting standard company policies or programs is not acceptable.** Preliminary identification of hazards and their respective controls for major work tasks or phases are outlined in ***Table 4.1.***

**Table 4.1 – Hazard Identification & Control**

| Activities & Tasks | Affected Personnel | Safety Hazards | Safety Hazard Controls |
|---|---|---|---|
| **All site tasks**<br><br>**Mandatory PPE (minimum):**<br>Level D PPE<br>(Refer to PPE section of HASP for specific components of Level D PPE based on the task being performed)<br><br>**As needed PPE:**<br>Hear protection when near heavy equipment<br><br>Upgrade to Level C PPE (as applicable) when necessary based on air monitoring and action levels | All on-site personnel | **Slip, trips, and falls** | **Safety controls for slips, trips, and falls include:**<br>■ Daily cleanup<br>■ Unused materials must be stored in a designated area<br>■ Unused tools must be picked up daily<br>■ All trash, scrap metal, and construction debris must be placed in the appropriate dumpsters<br>■ Icy walkways, stairs, work platforms, and scaffolding must be salted prior to use. Slip-on traction devices (YakTrax®) should also be considered. |
| | | **Manual lifting** | **Follow proper manual lifting technique.**<br>**Review primary precautions below:**<br>■ Keep load in close to the body<br>■ Keep hips and shoulders aligned (no twisting)<br>■ Maintain stability (keep a balanced position)<br>■ Think and plan difficult lifts (use two people when weight is >55-75 lbs) |
| | | **Noise- during operation of heavy equipment and power tools or working adjacent to such equipment** | **Safety controls to prevent hearing loss associated with excessive noise exposure include:**<br>■ Wear hearing protection while operating heavy equipment (unless with enclosed cab) or noisy power tools.<br>■ Wear hearing protection if you have to raise your voice talking to someone five feet away. |
| | | **Ladder hazards (to reach elevated work areas for inspection)**<br>■ Ladders kicking out or tipping over during use<br>■ Users fall from a ladder<br>■ Falling objects strike | **Ladders must be used in accordance with OSHA guidelines or fall protection must be implemented above six feet.**<br>**Ladder safe guidelines include, but are not limited to:**<br>■ Ensure all ladders are inspected and properly labeled<br>■ Maintain 3-point contact while working on step ladders and extension ladders (work requiring the use of both hands when on a ladder will require the worker to tie-off) |

## Table 4.1 – Hazard Identification & Control

| Activities & Tasks | Affected Personnel | Safety Hazards | Safety Hazard Controls |
|---|---|---|---|
| | | workers or pedestrians on lower work surfaces | ■ Keep your torso between the rails of the ladder<br>■ Do not use a step ladder as a straight ladder<br>■ Do not stand on the top two steps of a step ladder<br>■ Extend extension ladders three feet above the upper level<br>■ Secure the top and base of extension ladders<br>■ Extension ladders should have a 4:1 height to base ratio<br>■ Do not use metal ladders within 20 feet of exposed conductors or overhead power lines<br>■ **Ladders must be inspected prior to each use** |
| | | **Heat Stress during summer construction season**<br>■ All construction and remediation work performed at a HSI >80.<br>■ Work in Tyvek.<br>■ Work in Respirators. | **Implement basic heat stress precautions for all summer work, especially work performed with a Heat Stress Index (HSI) > 80.**<br>■ All workers must start the work day rested and well-hydrated. Lack of sleep, excessive alcohol consumption, and heavy exercise (without adequate hydration) the evening or morning before work can contribute to dehydration and heat stress and should be avoided.<br>■ Take regular drink breaks which are more frequent with higher HSI. Workers should not wait until they feel thirsty. Drinks may be provided in Exclusion Zones as long as coolers are sealed and single-use cups are used.<br>■ Highly laborious tasks or tasks performed in Tyvek or respirators should be monitored closely and rotated between employees so one worker can recover while the other is working.<br>■ Employees must know symptoms of heat stress and be instructed to notify site management when symptoms are observed in themselves or others. |
| | | **Heavy equipment hazards – Working near heavy equipment requires that general safety precautions be considered. When tasks require the use of certain types of heavy equipment (e.g., manlifts, forklifts, and cranes), they will be covered in more detail with respect to those tasks.**<br>■ Turnover due to the slope angle and/or stability<br>■ Struck by injuries (counterweight swing or run-over) | **Heavy equipment safety precautions include:**<br>■ Keep out of areas in which heavy equipment will be operating unless inspection activities require entry.<br>■ Contractor must provide operators are qualified and familiar with the **manufacturer's safe operating guidelines** for the equipment they are operating.<br>» Forklift – Operators license<br>» Manlift – Training certificate. Letter of Authorization and Training on company letterhead, or equivalent.<br>» Crane – State License and/or CCO<br>■ Equipment operators must ensure workers are kept clear from **crush points** created by counterweight swings and for boom movement.<br>■ Field Engineers must make sure they are seen by operators and given approval to pass near heavy equipment.<br>■ Field Engineers must not linger in blind spots.<br>■ Never lift or suspend a load over people<br>■ High visibility vests are required. |
| | | **Biological Hazards for inspections in overgrown areas or in staging areas where pests may have nested.**<br>■ Ticks (Lyme)<br>■ Poison Ivy<br>■ Bee/Wasp Stings | **Biological hazard safety controls include:**<br>■ Ticks and mosquitos:<br>» Use ***25% or more DEET*** on skin. Walking in overgrown areas where ticks may be present requires ***Permethrin*** applied to clothes ***in addition*** to DEET on skin.<br>» Check for ticks daily.<br>» Remove ticks only by using tweezers or tick removal |

| Table 4.1 – Hazard Identification & Control | | | |
|---|---|---|---|
| **Activities & Tasks** | **Affected Personnel** | **Safety Hazards** | **Safety Hazard Controls** |
| | | | tool. Report embedded ticks.<br>» Apply topical ointment (Neosporin®) and monitor bite for infection.<br>■ Bees/Wasps :<br>» Eliminate nest sites that interfere with office or field operations. Contact a pest control contractor as necessary.<br>» Persons with allergies must have an epi-pen on site.<br>■ Poison Ivy:<br>» Know how to recognize poison ivy plants and avoid them.<br>» Keep alcohol wipes in the first aid kit to wipe down skin that may have come in contact with poison ivy.<br>» Do not tools or equipment that may have come in contact with poison ivy. |

# 5 EMPLOYEE AND COMMUNITY AIR MONITORING (ECAMP)

Community air monitoring shall be performed in accordance with the New York State Department of Health Generic Community Air Monitoring Plan. The monitoring program shall include sampling and analyses for particulates (PM-10) and VOCs using sample equipment staged upwind and downwind of the work area while intrusive construction tasks are being conducted by the Contractor. A total of four community air monitoring stations, each containing monitors for PM-10 and VOCs, will be established around the perimeter of the site as needed. The samplers will run continuously during ground intrusive activities.

Actions to control the generation or release of site contaminants will be required if the difference between the downwind and upwind/background concentrations exceed the following action levels:

- 5 ppm for VOCs
- 100 µg/$m^3$ for PM-10 for a 15-minute average

The Contractor shall also monitor the work zone for the protection of individuals on site. The Contractor and subcontractors will comply with respiratory protection requirements that may be established by federal or state regulations. The Contractor and subcontractors are responsible for respiratory protection, as required, when atmospheric hazards have been identified until the condition mitigated and need for respiratory protection has subsided.

## 5.1 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FT OF POTENTIALLY EXPOSED INDIVIDUALS OR STRUCTURES

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negativepressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

# 6 MEDICAL MONITORING

Medical surveillance requirements are required by OSHA for persons who are exposed to lead (above OSHA action levels), perform asbestos abatement, wear respirators, perform hazardous waste work, and other activities. Subcontractors are required to have medical surveillance that complies with OSHA regulations.

## 6.1. FITNESS FOR RESPIRATOR USE

Persons who may wear respiratory protection must be provided respirators as regulated by 29 CFR 1926.103 and 29 CFR 1910.134. This Standard requires that an individual's ability to wear respiratory protection be medically certified before he / she performs designated duties. Where medical requirements of 29 CFR 1926.65 overlap those of 29 CFR 1910.134, the more stringent of the two will be enforced.

## 6.2. MEDICAL EXAMINATIONS

Medical examinations for persons conducting hazardous waste work, asbestos abatement, and lead work are administered on a pre-employment and annual basis and as warranted by symptoms of exposure or specialized activities. Medical exams must be administered by a board-certified (or one who is eligible for board certification) physician in Occupational Medicine. The examining physician is required to make a report to the employer of any medical condition which would place employees at risk when wearing a respirator, wearing other personnel protective equipment, or working with hazardous materials. The Contractor and subcontractors must maintain medical records in accordance with OSHA regulations.

## 6.3. HEAT & COLD STRESS

The timing and location of this project may be such that heat / cold stress could pose a threat to the health and safety of site personnel. Work / rest regimens will be employed as deemed necessary by the Contractor Project Field Supervisor. However, subcontractor Safety Competent Persons may initiate heat/cold stress monitoring at any time as necessary to protect their employees. Special clothing and an appropriate diet and fluid intake will be recommended to all on-site personnel to further reduce these temperature-related hazards. Site workers should stop work, and notify the Project Field Supervisor when they observe symptoms of heat / cold stress in themselves or co-workers.

### 6.3.1. Heat Stress Monitoring

Heat stress monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70°F or above. To monitor the worker, one of the following methods should be employed:

- Heat Stress Index

**Heat Index Chart**
**Temperature (°F) vs. Relative Humidity**

| | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | 55% | 60% | 65% | 70% | 75% | 80% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **115** | 111 | 115 | 120 | 127 | 135 | 143 | 151 | | | | | | | | |
| **110** | 105 | 108 | 112 | 117 | 123 | 130 | 137 | 143 | 151 | | | | | | |
| **105** | 100 | 102 | 105 | 109 | 113 | 118 | 123 | 129 | 135 | 142 | 149 | | | | |
| **100** | 95 | 97 | 99 | 101 | 104 | 107 | 110 | 115 | 120 | 126 | 132 | 136 | 144 | | |
| **95** | 90 | 91 | 93 | 94 | 96 | 98 | 101 | 104 | 107 | 110 | 114 | 119 | 124 | 130 | 136 |
| **90** | 85 | 86 | 87 | 88 | 90 | 91 | 93 | 95 | 96 | 98 | 100 | 102 | 106 | 109 | 113 |
| **85** | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 93 | 95 | 97 |
| **80** | 75 | 76 | 77 | 77 | 78 | 79 | 79 | 80 | 81 | 81 | 82 | 83 | 85 | 86 | 86 |
| **75** | 70 | 71 | 72 | 72 | 73 | 73 | 74 | 74 | 75 | 75 | 76 | 76 | 77 | 77 | 78 |

| Heat Index Chart<br>Temperature (°F) vs. Relative Humidity<br>10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80% | |
|---|---|
| **Heat Index/Heat Disorders** | |
| **Heat Index** | **Possible heat disorders for people in higher risk groups** |
| **DANGER<br>130 or higher** | Heatstroke/sunstroke highly likely with continued exposure.<br>• **Moderate and strenous outdoor activity prohibited** |
| **WARNING<br>105-130** | Sunstroke, heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.<br>• **Strenuous outdoor activity while wearing Tyvek is prohibited without the use of personal cooling devices.**<br>• **Workers must drink every 15 minutes or more frequently at their discretion**<br>• **Air conditioned break areas must be available.** |
| **CAUTION<br>90-105** | Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.<br>• **Strenuous outdoor activity while wearing Tyvek is prohibited above a HSI of 99 without the use of personal cooling devices and is recommended for lower HSI.**<br>• **SSHC to monitor employees for symptoms of heat stress.**<br>• **Workers must drink every 30 minutes or more frequently at their discretion.**<br>• **Air conditioned break areas must be made available for morning, lunch, and afternoon breaks.** |
| **CONCERN<br>75-90** | Fatigue possible with prolonged exposure and/or physical activity.<br>• **SSHC to monitor employees for symptoms of heat stress.**<br>• **Workers must drink every 60 minutes or more frequently at their discretion.**<br>• **Shaded break areas must be made available for morning, lunch, and afternoon breaks. Air conditioning is recommended.** |
| **Source: National Weather Service [Modified – The initial HSI for the lowest ("CONCERN") heat stress category was reduced from 80 to 75 because of the potential for increased heat stress when wearing Tyvek.]** | |

- Heart rate should be measured by the radial pulse for a 30 second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following cycle by one-third.
- Oral temperature should be measured at the end of the work period (before drinking). If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period. If the oral temperature still exceeds 99.6°F at the beginning of the next rest period, shorten the next work cycle by one-third. Do not permit a worker to wear a semi-permeable or impermeable garment when his / her oral temperature exceeds 100.6°F.

### 6.3.2. Cold Stress Monitoring

Work / rest schedules must be altered to minimize the potential for cold stress. Cold stress is defined as a decrease in core body temperature to 96.8°F and / or cold injury to body extremities. Decreases in core body temperature are associated with reduced mental alertness, reduction in rational decision making, or loss of consciousness in severe cases. Symptoms of cold stress include pain in extremities (i.e. hands and feet) and severe shivering. If workers experience these symptoms, then stop work and implement the following controls.

- Workers must don adequate dry insulating clothing; and
- Adjust the work / rest schedule to increase the amount of rest / re-warming time.

- Toolbox safety meetings discussing symptoms of cold stress, clothing requirements, and work breaks must be held when the wind chill temperature (see Appendix A) drops below 0°F and EACH DAY the wind chill temperature is below 25°F.

The wind chill index provided below shows the effective cooling on exposed skin. When the wind blows across the skin, it removes the insulating layer of warm air adjacent to the skin. When all factors are the same, the faster the wind blows, the greater the heat loss, which results in a colder feeling. Wind chill temperatures that are **25°F** below zero or are extremely dangerous. Workers must protect any exposed skin, especially the face, ears, and fingers.

**Wind Chill Chart (Temperature vs Wind Speed)**

| Wind Speed-mph | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Calm** | **5** | **10** | **15** | **20** | **25** | **30** | **35** |
| **Temperature (Degrees F)** | **Wind Chill** | | | | | | |
| **45** | 43 | 34 | 29 | 26 | 23 | 21 | 20 |
| **40** | 37 | 28 | 23 | 19 | 16 | 13 | 12 |
| **35** | 32 | 22 | 16 | 12 | 8 | 6 | 4 |
| **30** | 27 | 16 | 9 | 4 | 1 | -2 | -4 |
| **25** | 22 | 10 | 2 | -3 | -7 | -10 | -12 |
| **20** | 16 | 3 | -5 | -10 | -15 | -18 | -20 |
| **15** | 11 | -3 | -11 | -17 | -22 | -25 | -27 |
| **10** | 6 | -9 | -18 | -24 | -29 | -33 | -35 |
| **5** | 0 | -15 | -25 | -31 | -36 | -41 | -43 |
| **0** | -5 | -22 | -31 | -39 | -44 | -49 | -52 |
| **-5** | -10 | -27 | -38 | -46 | -51 | -59 | -64 |
| **-10** | -15 | -34 | -45 | -51 | -59 | -64 | -67 |
| **-15** | -21 | -40 | -51 | -60 | -66 | -71 | -74 |
| **-20** | -26 | -46 | -58 | -67 | -74 | -79 | -82 |
| **-25** | -31 | -52 | -65 | -74 | -81 | -86 | -89 |

If you would like to calculate the wind chill index for combinations of temperature and wind other than those given in the table above, you can use the formula:

**WC = 91.4 - (0.474677 - 0.020425 * V + 0.303107 * SQRT(V)) * (91.4 - T)**

where: WC = wind chill index; V = wind speed (mph); T = temperature (° F)

# 7 EMERGENCY RESPONSE PLAN

This emergency response section details actions to be taken in the event of site emergencies. The SSHC is responsible for implementation of emergency response procedures and will ensure that a **First Aid/CPR trained person is on site at all times when work activities are in progress.**

## 7.1. EMERGENCY PHONE NUMBERS

To be posted or provided on site. Emergencies encountered on this site will be responded to by a combination of off-site emergency services and site personnel.

| EMERGENCY NUMBER<br>Fire, Explosion, Emergency Medical, and Spills that may reach surface waters | |
|---|---|
| **Site Address** | **Phone Number** |
| **Smith Street<br>Herkimer, NY** | 911 |

| NOTIFICATIONS and CONTACT INFORMATION<br>Fire, Explosion, Emergency Medical, OSHA-Recordable Injuries, Petroleum Spills | | |
|---|---|---|
| **NATIONALGRID** | | |
| **Project Manager** | Steven P. Stucker | **Phone:** 315-428-5652 |
| **O'BRIEN & GERE** | | |
| **Project Officer** | James R. Heckathorne, PE | **Office:** 315-956-6277<br>**Cell:** 315-200-5209 |
| **Project Manager** | Stephen W. Anagnost, PE | **Office:** 315-956-6259<br>**Cell:** 315-480-0094 |
| **Resident Engineer** | TBD | **Office:**<br>**Cell:** |
| **Manager of Corporate Health & Safety** | Jeffrey R. Parsons, CIH | **Office:** 315-956-6871<br>**Cell:** 315-391-0638 |
| **MUNICIPAL (non-emergency)** | | |
| **Police** | Herkimer | (315) 866-4330 |
| Fire Department | Herkimer | (315) 866-2242 |
| **Hospital** | St. Luke's – Memorial Hospital Center, Utica, NY | (315) 624-5170 |
| **STATE AND FEDERAL (non-emergency)** | | |
| **NYSDOH** | Scarlett E. Messier | (518) 402-7860 |
| **NYSDEC** | Bernard Franklin | (518) 402-9662 (Env Remediation)<br>800-457-7362 (Spill Hotline) |
| **National Response Center (NRC) for Oil/Chemical Spills** | | 800-424-8802 |

| NOTIFICATIONS and CONTACT INFORMATION<br>Fire, Explosion, Emergency Medical, OSHA-Recordable Injuries, Petroleum Spills | | |
|---|---|---|
| **OSHA** | Syracuse Area Office<br>3300 Vickery Road<br>North Syracuse, NY | (315) 451-0808 |

## 7.2. EMERGENCY ROUTE

Refer to attached ***Figure 1*** for Hospital Route Map.

## 7.3. EMERGENCY INVENTORY

In addition to those items specified elsewhere, the Contractor will maintain the following equipment:

- First aid / Bloodborne pathogens kit – The **minimum size is a 25-person first aid kit** (Radnor RAD64058004 or larger available from Airgas)
- Fire extinguishers – located within 25' of hot work
- Spill Control Kit(s) – Provide all applicable spill control supplies to contain spills of at least 55 gallons including overpacks for 55 gallon drums

## 7.4. GENERAL EMERGENCY RESPONSE PLAN

### 7.4.1. Evacuation Signal

In addition to the site specific alarms, verbal/radio communications directing project personnel to evacuate or a building fire alarm will also be used. Do NOT leave site vehicles or equipment on access roads and emergency exits such that emergency response vehicles or personnel may be obstructed.

### 7.4.2. Muster Point

The muster point in event of an emergency that requires evacuation of the work area is the Resident Engineer's field office. The muster point will be reviewed with all personnel. The Project Field Supervisor or designee will account for all personnel.

## 7.5. CALL FOR EMERGENCY SUPPORT

In the event of a site emergency, the Project Field Supervisor or designee will call 911. When necessary, the Project Field Supervisor will coordinate the arrival of on-site emergency personnel with the Contractor's security, safety, and/or emergency response employees.

The Project Field Supervisor or designee will briefly explain the nature of the emergency and site conditions as follows:

- Indicate his/her name
- Location of emergency (site address, support zone or exclusion zone)
- Description of emergency conditions that may require special rescue equipment, such as confined spaces; excavations, and elevated work platforms
- Potential chemical hazards and recommended PPE
- Emergency decontamination procedures

- Incident Command System (ICS)

### 7.5.1. Incident Command System (ICS)

The Project Field Supervisor or designated alternate shall function as the initial Incident Commander when the emergency plan is initiated by calling 911. The Project Field Supervisor will decide whether site personnel will evacuate to the Muster Point or divert site resources (personnel and equipment) to provide initial response actions in accordance with this HASP until emergency responders arrive on site. When emergency responders arrive, the Project Field Supervisor will identify himself or herself as "in charge" and transfer authority to the arriving Incident Commander.

## 7.6. FIRE & EXPLOSION RESPONSE PLAN

***NOTE – Site personnel will respond to incipient stage fires using 20 lb Type ABC dry chemical fire extinquishers.***

All fires or explosions must be reported to the Resident Engineer and National Grid. A fire that CANNOT be readily extinguished with a fire extinguisher will be considered major and will require evacuation of the work area personnel to *Muster Point* areas per this HASP. However, the Project Field Supervisor or designee may only approach fires/explosions to the extent that fire safety considerations allow. If personal injuries result from any fire or explosion, the procedures outlined in the *Personal Injury Response Plan* will also be followed.

## 7.7. PERSONAL INJURY RESPONSE PLAN

Treatment for minor injuries will be provided on site using available first aid supplies and personnel trained in first aid. For **minor injuries** that are not life-threatening but require further medical attention, the Contractor and subcontractors should utilize a nearby occupational clinic during normal business hours, if available. Emergency rooms should be used, if necessary, to treat minor injuries that require further medical treatment after normal business hours.

**Emergency or life-threatening injuries,** including puncture wounds to the head, chest, and abdomen, serious head and spinal cord injuries, and loss of consciousness must be treated at the hospital emergency room.

Route maps to the hospital (***Figure 1***) must be posted in the Contractor's on-site office trailer and all subcontractor office trailers (if any).

## 7.8. SPILL RESPONSE

Site personnel should expect and be properly trained and equipped to handle small spills since the project may involve handling drums which may leak or rupture. Although overpacks and spill sorbents will be staged to support drum handling, equipment dedicated for emergencies must be stored separately in a readily visible location(s). The minimum size spill kit should have the capacity to cleanup and containerize spills of **55 gallons**. In addition to drums, other potential spills include leaking gasoline, diesel, antifreeze, hydraulic fluid, or oil from heavy equipment. If a spill of any type should occur, the SSHC or designee should report the spill immediately to a site owner representative and implement procedures in this Spill Response Plan. Site personnel will generally respond to spills as follows:

- **Stop the leak immediately** if it can be done without directly contacting the leaking material. Generally, this will consist of turning heavy equipment off to remove pressure on various fluid systems.
- Remove or stop all **ignition sources** (hot work, generators, etc.) that are within 25' of any part of the spill.
- On-site personnel should immediately secure the area to **prevent unauthorized entry** into the spill area.
- Although not likely given the anticipated types of spills, the SSHC or designee should initiate the *General Emergency Response Plan* in this HASP if a spill may cause an explosion, death, or serious injury.

- Site personnel may only respond to **incipient stage fires** regardless if such fires are associated with a spill.
- **Confined Space Issue** – If the leak occurs in an excavation where natural ventilation is limited, air monitoring will be required prior to entering the spill area. This is primarily an issue for fuel (gasoline, diesel, and kerosene) spills. The SSHC will determine if a fuel spill requires air monitoring.
- **PPE for Spills ≤55 gallons** to open areas generally requires Modified Level D PPE (poly-coat Tyvek, nitrile gloves, and boot covers or boot decontamination). Over-boots or boot covers may also be used if persons cleaning the spill would have to walk on spilled materials. Latex gloves are not acceptable and will degrade with exposure to petroleum products. Spills into confined spaces will require PPE and other safety procedures specified on Confined Space Entry Permit.

## 7.9. EMERGENCY REPORTING

**Any emergency or accident will be reported to the Resident Engineer and National Grid.** The Resident Engineer and National Grid will review all emergency or accident reports and may further investigate any such report if necessary. The Contractor will see that the area officer of OSHA is notified within 8 hours should the emergency cause three (3) or more personnel to be injured and transported to the hospital, or if there is a fatality.

An **Incident Investigation Form** (***Attachment 12***) must be completed for all injuries, illnesses, spills, fire, explosion, or property damage greater than $1,000. The absence of an injury does not preclude the need to complete an Accident Investigation Form as such incidents will be classified as "near miss" or "other." The form must be completed or reviewed by the Project Field Supervisor or designee. It will include, but is not limited to, the nature of the problem, time, location, and corrective actions taken to prevent recurrence. This **report must be completed and sent to the Resident Engineer and National Grid's representative within 24 hours**. If all the "facts" cannot be determined in that period of time, then draft report will be submitted and a final report will be submitted immediately upon completing the investigation.

# *Figures*

## FIGURE 1 – HOSPITAL ROUTE MAP

mapquest

Notes

Trip to:

## St Lukes Memorial Hospital Center Med Lib
## 1656 Champlin Ave

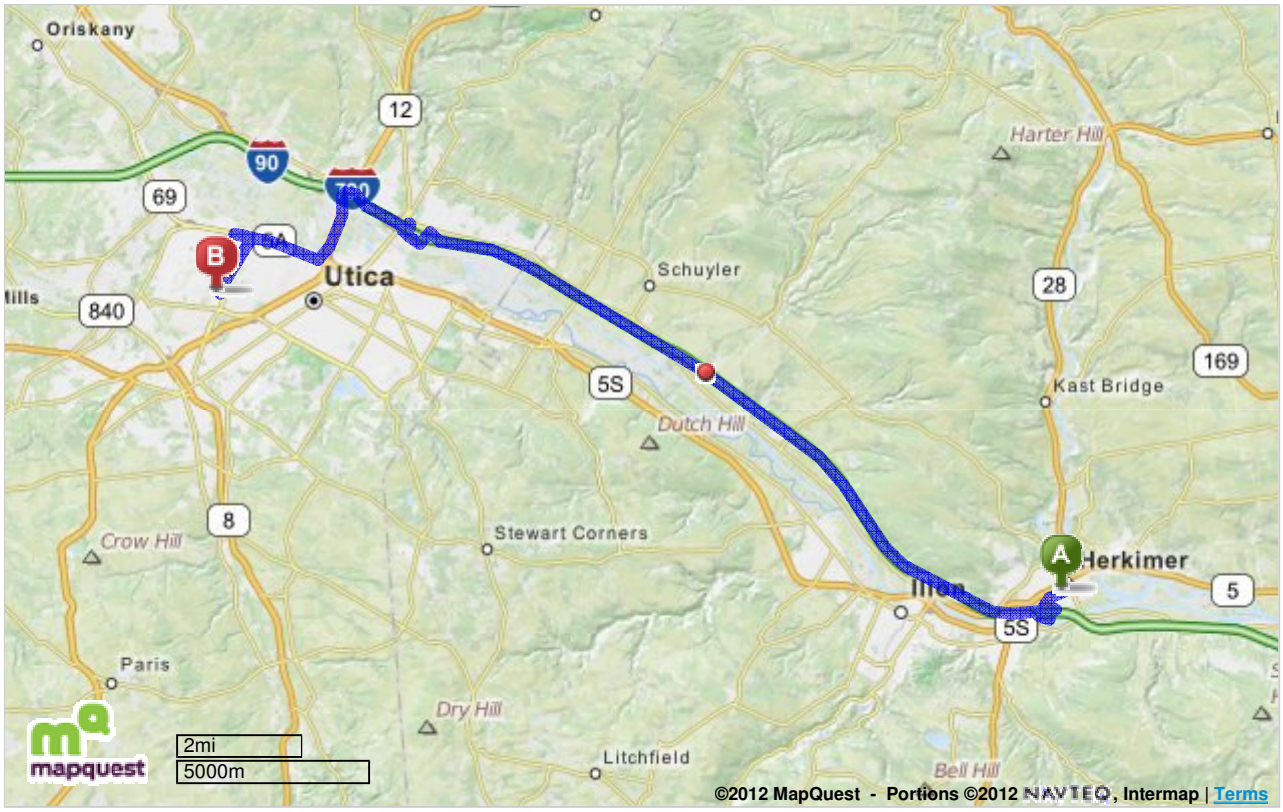
Utica, NY 13502
(315) 798-6059
20.94 miles / 30 minutes

### W Smith St & William St, Herkimer, NY 13350

| | | |
|---|---|---|
| 1. Start out going **southwest** on **W Smith St** toward **Dewey Ave**. Map | **0.3 Mi** *0.3 Mi Total* |
| 2. Turn **left** onto **Mohawk St**. Map<br>*Mohawk St is just past Central Ave*<br>*If you are on 2nd Ave and reach W State St you've gone about 0.1 miles too far* | **0.4 Mi** *0.6 Mi Total* |
| 3. Merge onto **I-90 W** / **New York State Thruway W** via the ramp on the **left** toward **Buffalo** (Portions toll). Map<br>*If you are on RT-28 S and reach RT-28 N you've gone a little too far* | **13.5 Mi** *14.2 Mi Total* |
| 4. Take **EXIT 31** toward **I-790** / **Utica** / **RT-8** / **RT-12**. Map | **0.8 Mi** *15.0 Mi Total* |
| 5. Keep **right** to take the **Genesee St North** ramp toward **I-790 W** / **Rome** / **RT-5** / **Watertown** / **RT-8** / **RT-12** / **RT-49**. Map | **0.2 Mi** *15.1 Mi Total* |
| 6. Turn **slight right** onto **N Genesee St**. Map | **0.1 Mi** *15.2 Mi Total* |
| 7. Turn **right** onto **Auert Ave**. Map<br>*If you reach Riverside Dr you've gone a little too far* | **0.05 Mi** *15.3 Mi Total* |
| 8. Merge onto **I-790 W** / **RT-5 W** toward **RT-12** / **RT-8**. Map | **2.4 Mi** *17.7 Mi Total* |
| 9. Take the **RT-5A W** ramp toward **Whitesboro**. Map | **0.3 Mi** *18.1 Mi Total* |
| 10. Merge onto **Oriskany St W**. Map | **1.4 Mi** *19.4 Mi Total* |
| 11. **Oriskany St W** becomes **Oriskany Blvd** / **RT-5A W**. Map | **0.2 Mi** *19.6 Mi Total* |
| 12. Make a **U-turn** at **Myers Ave** onto **Oriskany Blvd** / **RT-5A E**. Map<br>*If you are on RT-5A W and reach Edward St you've gone a little too far* | **0.2 Mi** *19.8 Mi Total* |
| 13. Turn **slight right** onto **Whitesboro St**. Map<br>*If you are on Oriskany St W and reach Platt St you've gone about 0.8 miles too far* | **0.1 Mi** *19.9 Mi Total* |
| 14. Take the 1st **right** onto **Champlin Ave**. Map<br>*If you reach Inman Pl you've gone a little too far* | **1.1 Mi** *20.9 Mi Total* |
| 15. **1656 CHAMPLIN AVE** is on the **right**. Map<br>*Your destination is 0.5 miles past Douglas Ave*<br>*If you reach Burrstone Rd you've gone about 0.3 miles too far* | |

### St Lukes Memorial Hospital Center Med Lib

Total Travel Estimate: **20.94 miles - about 30 minutes**



# *Attachments*

**ATTACHMENT 1**

Pre-Work Briefing

O'BRIEN & GERE

ATTACHMENT 1

# Pre-Work Briefing

File Name: 01_PREWORK_BRIEFING.doc

Revised: January 29, 2002

| | | | |
|---|---|---|---|
| **Client:** | | | |
| **Project Name:** | | **Project No.** | |
| **Project Location:** | | | |
| **SSHC:** | | | |
| **Main Points of Briefing:** | ☐ O'Brien & Gere Safety Requirements<br>☐ Site-Specific Safety Pan or JSA<br>☐ Site Owner Safety Requirements | Other: | |

The purpose of the Pre-Work Briefing is to provide **site-specific safety orientation** to employees and subcontractors. This certifies that undersigned individuals have read, understand, and agree to comply with applicable **site-specific safety requirements** that can be obtained from site safety plans, site Job Safety Analyses (JSAs), site owner requirements, and/or other site safety documents furnished to me by O'Brien & Gere. I understand that these safety requirements are not "all-inclusive" and that I will be expected to follow any additional safe work practices applicable to my specific scope of work.

| Print Name | Signature | Company | Date |
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**-- Have EACH employee sign this form before they begin work on site --**

**ATTACHMENT 2**

Entry/Exit Log

O'BRIEN & GERE

ATTACHMENT 2

# Entry/Exit Log

File Name: 02_ENTRY_LOG.doc
Revised: June 1, 2001

| | | | |
|---|---|---|---|
| **Project Name** | | **Date** | |
| **Project Location** | | **Job & Phase #** | |

| | Name | Company | Time In | Time Out | Reason |
|---|---|---|---|---|---|
| 1 | | | | | |
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| 19 | | | | | |
| 20 | | | | | |

**ATTACHMENT 3**

Pre-Task Planner

ATTACHMENT 3

# Pre-Task Planner

File Name: 03_PRETASK_PLANNER.doc
Revised: September 8, 2006

| | | | |
|---|---|---|---|
| **Project Name:** | | **Date:** | |
| **Company Name:** | | **Project No.:** | |
| **Authorized Tasks**<br>**Scope of Work for the day (be specific):** | | | |

| YES | NO | Supervisor/Superintendent/Foreman Planning |
|---|---|---|
| | | **Project Safety Orientation** has been provided to all workers prior to work. **IF NO**, please explain below: |
| | | **Pre-Work Documentation** has been submitted for all workers. **IF NO**, identify the missing information:<br>☐ Drug Testing ☐ Training Certificates ☐ Other: |
| | | The **Health & Safety Plan (HASP)** or **Job Safety Analysis (JSA)** is applicable to the Authorized Tasks and safety requirements in the HASP or JSA have been implemented. **IF NO**, explain below: |
| | | ANY **unusual or changed site conditions** that may affect safety hazards. **IF YES**, explain in "*Key Safety Instructions*" and review appropriate changes to safety equipment or procedures.<br>☐ Heavy Rain ☐ Possible Lightening ☐ High Winds ☐ Heat ☐ Cold ☐ New Work Area<br>☐ Other: |
| | | ANY **new tools or equipment or changes to work methods** that may affect safety hazards. **IF YES**, explain in "*Key Safety Instructions*" and review appropriate changes to safety equipment or procedures. |
| | | **Permits & Inspections** needed for authorized tasks? (check all that apply)<br>☐ Permit-Required Confined Space Entry ☐ Hot Work ☐ Daily Excavation Checklist<br>☐ Non-Permit Confined Space Downgrade ☐ Line Break ☐ Daily Scaffolding Inspection<br>☐ Alternate Entry (Confined Space) ☐ Crane Pick ☐ Other: |

| YES | NA | Superintendent/Foreman Safety Message and Information to Field Crew(s) |
|---|---|---|
| | | **PPE** was reviewed with emphasis on any new PPE or changes to PPE from previous day: (check all that apply)<br>**Eye Protection:** ☐ Safety glasses ☐ Chemical Goggles ☐ Dust Goggles ☐ Face Shield<br>**Head Protection:** ☐ Hard Hats<br>**Foot Protection:** ☐ Safety Shoes ☐ Chemical Resistant Over-boots<br>**Ear Protection:** ☐ Ear Plugs/Muffs<br>**Hand Protection:** ☐ Cut-Resistant Gloves ☐ Chemical Resistant Gloves ☐ Other: _____<br>**Fall Protection:** ☐ Harness & Lanyard with shock absorber ☐ Harness & Lanyard without shock absorber ☐ Other Fall Protection:<br>**Live Electrical:** ☐ Electrical Face Shield ☐ Electrical Coveralls ☐ Electrical Gloves<br>**Clothing:** ☐ Tyvek ☐ Tychem QC ☐ Tychem SL ☐ Kevlar Chaps/Vest ☐ High Vis Vest<br>**Work Over Water:** ☐ Life Vest ☐ Ring Buoy ☐ Rescue Skiff/Boat<br>**Other (describe):** ☐ |
| | | **Permits** have been reviewed with field crew(s). |
| **Key Safety Instructions Or Message For The Day:** | | |

| | | |
|---|---|---|
| **O'Brien & Gere Representative (review):** | | |
| **Subcontractor Foreman/Supervisor Signature (authorize):** | | |
| **Crew Signatures (acknowledge):** | | |
| | | |
| | | |
| | | |

**ATTACHMENT 4**

Safety/Toolbox Meeting Form

O'BRIEN & GERE

ATTACHMENT 4

# Safety/Toolbox Meeting

File Name: 04_TOOLBOX.doc
Revised: June 22, 2007

| | | | |
|---|---|---|---|
| **Client:** | | **Project No.:** | |
| **Project Name:** | | **Today's Date:** | |
| **Project Location:** | | | |
| **Conducted By:** | | | |
| **Meeting Topic:** | | | |

| | Name | Signature | Company Name |
|---|---|---|---|
| 1 | | | |
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| 19 | | | |
| 20 | | | |

**Meeting Topics (be specific):**

**KEEP COPIES OF ALL TOOLBOX MEETING MINUTES WITH PROJECT RECORDS**

**ATTACHMENT 5**

Safety Audit Checklist

O'BRIEN & GERE
www.obg.com

ATTACHMENT 5

# Environmental Safety Audit Checklist

ile Name: 05_AUDIT_SHORT_Environmental.doc
Revised: April 23, 2010

| | | | |
|---|---|---|---|
| **Project Name:** | | **Project No.:** | |
| **Project Location:** | | **Auditor:** | |
| **Site Supervisor:** | | **Date of Audit:** | |

**Field Office** (place an X in one of the three categories for each item - specify deficiencies below)

| N/A | Y | N | Documentation & Permits |
|---|---|---|---|
| | | | **First aid supplies** and/or **Medical Service** is available. |
| | | | **Emergency numbers** posted. |
| | | | **OSHA** and Department Of Labor **Poster** conspicuously posted ("NA" if no field office) |
| | | | **Corporate Health and Safety Manual** is on site and located: ☐ field office ☐ vehicle ☐ intranet |
| | | | A project **safety plan or JSA** was developed and reviewed with site personnel who "sign-off". |
| | | | Subcontractors have current **Safety Prequalification** form on file with Corporate H&S. |
| | | | **Toolbox safety meetings** documented. ☐ Daily ☐ Weekly ☐ Other: |
| | | | Excavation Competent Person documents **excavation inspections** on *Daily Excavation Checklist* |
| | | | **Hot Work/Confined Space Entry Permits** documented and issued daily for hot work and confined space entry. |
| | | | **Air Monitoring instrument calibrations** have been conducted and records retained on site. |
| | | | **Respirator Fit Tests** are within the last 12 months for those who may use respirators. |
| | | | |

***NOTES(Identify Major Subs):***

**Project** (place an X in one of the three categories for each item - specify deficiencies below)

| N/A | Y | N | Field Observations of Conditions & Behavior |
|---|---|---|---|
| | | | **Safety glasses and Safety Shoes** used for all field work |
| | | | **Hard Hats** are worn in all areas with remediation, construction, drilling, demolition, and overhead activities |
| | | | **Face Shields** are on-site & used when handling all chemicals when there is a possibility of splashes to the face |
| | | | **Ear protection** used where noise requires you to raise your voice to be heard <5 feet away |
| | | | **Chemical Protective Clothing** is used to prevent contact with corrosives or hazardous materials (Mod Level D) |
| | | | **Tick Prevention** – DEET & Permethrin repellants used for work in ALL overgrown areas on projects in NY, NJ, PA, CT, and MA. (Use as necessary in other states.) Tick prevention is addressed in safety plan or JSA? |
| | | | **Fall protection** used by employees working above 6 feet, within 15' of a roof edge, and in manlifts |
| | | | **Kevlar Chaps & Jacket** used by anyone operating a chain saw during clearing & grubbing work |
| | | | **Ladders** used properly: stepladder fully open, extension ladder 3' past upper surface & tied off |
| | | | Good **housekeeping**, job-site looks neat, materials are staged in an orderly manner. |
| | | | **Decontamination Areas** are established and properly maintained |
| | | | All chemicals and **chemical containers** properly labeled and in **secondary containment**. |
| | | | **Barricades** are setup around any open holes, trenches, drilling, or other hazardous areas |
| | | | **GFIs** used on all extension cords and temporary 110/120 volt wiring. |
| | | | **Lockout/Tagout** is used - each employee has own lock – a tag is attached to all locks |
| | | | **Fire Extinguishers** are present for all hot work and weekly inspections are documented on tags |
| | | | **Emergency shower & eyewash** is provided when there is a potential for splashes by corrosives |
| | | | **Plumbed emergency showers and eyewashes** are inspected AND flushed weekly and documented on **tags** affixed to each unit. |
| | | | **Self-contained eyewashes** are inspected weekly and changed based on preservative specifications and documented on **tags** affixed to each unit. |
| | | | **Rescue services** notified prior to **confined space entry**. Specify Service: |
| | | | **Retrieval equipment** (harness, lifeline, and hoisting apparatus) setup during **confined space** entry |
| | | | **Air monitoring is conducted** as required by plan/JSA and action levels have been established |
| | | | **Respirators** used when air monitoring exceeds action levels (Level C PPE) |
| | | | Precautions are in place for **working over water** (☐ life vests, ☐ ring buoy, and ☐ rescue skiff) |
| | | | Drilling and other "high reach" work maintains **20' clearance to overhead power lines**. |
| | | | **Utilities** have been located and marked in ALL affected areas prior to excavating, drilling, and similar work |

***NOTES*: (Use reverse side as necessary.)**

**ATTACHMENT 6**

Soil Analysis Checklist

O'BRIEN & GERE

ATTACHMENT 6

# Soil Analysis Checklist

File Name: 06_EXCAVATION_SOIL_ANALYSIS.doc
Revised: February 19, 2003

| | | | |
|---|---|---|---|
| **Client:** | | **Today's Date:** | |
| **Project Name:** | | **Job No.:** | |
| **Project Location:** | | **Weather:** | |
| **Competent Person:** | | | |
| **Where was the sample taken:** | | | |
| **Excavation Length, Depth & Width** | **L:** | **D:** | **W:** |

**NOTE: IF soil is assumed to be Type C, then soil analysis is not necessary. Type C represents the most conservative classification.**

| **VISUAL TEST** | | | | | | |
|---|---|---|---|---|---|---|
| **Particle type** | ☐ Fine grained (cohesive) | | ☐ Granular (sand/silt or gravel) | | ☐ Other: | |
| **Water conditions** | ☐ Wet | ☐ Dry | ☐ Seeping Water | ☐ Surface Water Present | | ☐ Submerged |
| **NOTES:** | | | | | | |

| **Yes** | **No** | **N/A** | **Description** |
|---|---|---|---|
| | | | Layered soils dipping into excavation? If *Yes*, describe: |
| | | | Excavation exposed to vibrations? If *Yes*, from what: |
| | | | Previously disturbed soils? |
| | | | Crack like openings or sprawlings observed? |
| | | | Underground utilities? If *Yes*, what type: |
| | | | Layered soils? ***Note:*** *The least stable layer controls the soil type.* |

| **MANUAL TEST** | | | | | |
|---|---|---|---|---|---|
| **Plasticity** | ☐ Cohesive | ☐ Non-cohesive | **Dry Strength** | ☐ Cohesive (broken w/ difficulty) | ☐ Granular (crumbles easily) |
| **Wet shake** | ☐ Water comes to surface (granular material) | | | ☐ Surface remains dry (clay material) | |

| **THUMB TEST** *NOTE: Used to estimate unconfined compressive strength of cohesive soil. Performed on undisturbed soils.* | | | |
|---|---|---|---|
| **Test performed** | ☐ Yes | ☐ No | ☐ N/Ap, Explain: |
| **Soil indented by thumb with very great effort** | | | ☐ Type A |
| **Soil indented by thumb with some effort** | | | ☐ Type B |
| **Soil easily penetrated several inches by thumb with little or no effort. *NOTE: If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.*** | | | ☐ Type C |

| **PENETROMETER or SHEARVANE TEST** *NOTE: Used to estimate unconfined compressive strength of cohesive soils:* | | | |
|---|---|---|---|
| **Test performed** | ☐ Yes | ☐ No | Device Used/Serial #: |
| **Soil with unconfined compressive strength of 1.5 tsf or greater** | | | ☐ Type A |
| **Soil with unconfined compressive strength greater than 0.5 tsf and less than 1.5 tsf** | | | ☐ Type B |
| **Soil with unconfined compressive strength of 0.5 tsf or less. If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting** | | | ☐ Type C |

***NO soil is type A if fissured, subject to vibration, previously disturbed, layered dipping into excavation on a slope of 4h:1v***

| **SOIL CLASSIFICATION** | | | |
|---|---|---|---|
| ☐ Stable Rock | ☐ Type A | ☐ Type B | ☐ Type C |

| **SELECTION of PROTECTIVE SYSTEM (Refer to Appendix F of 29CFR1926)** | | | |
|---|---|---|---|
| ☐ Sloping (Appendix B)<br>specify angle: _____ | ☐ Timber shoring<br>(Appendix C) | ☐ Trench shield<br>Max depth in this soil: _____ | ☐ Hydraulic shoring<br>(Appendix D) |
| **Keep 1 copy of each competed Soil Analysis Checklist on site for the project duration.** | | | |

**-- Keep 1 copy of EACH Soil Analysis Checklist on site for the project duration --**

**ATTACHMENT 7**

Daily Excavation Checklist

O'BRIEN & GERE

ATTACHMENT 7

# Daily Excavation Checklist

File Name: 07_EXCAVATION_DAILY_CHECKLIST.doc
Revised: June 22, 2007

| | | | | |
|---|---|---|---|---|
| **Client:** | | | **Today's Date:** | |
| **Project Name:** | | | **Approx. Temp** | |
| **Project Location:** | | | **Approx. Wind Dir** | |
| **Job No.:** | | | **SSHC:** | |
| **Excavation Depth & Width:** | **D:** | **W:** | **Soil Class:** | |
| **Protective System Used:** | | | | |
| **Activities in Excavation:** | | | | |
| **Competent Person:** | | | | |

Excavation > 4' deep? ☐ Yes ☐ No If ***Yes***, - Evaluate if the excavation is a permit-required confined space or can be downgraded to a Non-Permit Space

***CAUTION****: Any excavation over 5 feet must be sloped or shored. Excavations >20 feet require review by a Professional Engineer. Any items marked* ***NO*** *on this form* ***MUST*** *be corrected prior to any employees entering the excavation. Review Excavation from the Corporate Health & Safety Manual for guidance.*

| YES | NO | N/A | INSPECTION ITEMS |
|---|---|---|---|
| | | | **GENERAL** |
| | | | Employees in, or near, excavations are protected from cave-ins or from being struck by loose rock/soil |
| | | | Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation |
| | | | Engineering designs for sheeting and/or manufacturers data on trench box capabilities on site |
| | | | Adequate signs posted, and barricades provided |
| | | | Training (i.e, Toolbox meeting) conducted with employees prior to employees entering excavation |
| | | | Proper sloping, shoring, and/or distance controls are in place to prevent damage to footings, foundations, sidewalks, roadways, and similar structures from cave-ins or excavation equipment. |
| | | | **UTILITIES** |
| | | | Utility company contacted and given 24 hrs notice and/or utilities already located and marked |
| | | | Overhead lines located, noted, and reviewed with operator |
| | | | Utility location reviewed with operator, and precautions taken to ensure contact does not occur |
| | | | Utilities crossing the excavation supported, and protected from falling materials |
| | | | Underground installations protected, supported or removed when excavation is open |
| | | | **WET CONDITIONS** |
| | | | Precautions taken to protect employees from water accumulation (i.e., continuous dewatering) |
| | | | Surface water or runoff diverted/controlled to prevent accumulation in the excavation |
| | | | Inspection made after every rainstorm or other hazard-increasing occurrence |
| | | | **HAZARDOUS ATMOSPHERE** |
| | | | Air in the excavation tested for oxygen deficiency, combustibles, or other contaminants |
| | | | Ventilation used in atmospheres that are $O_2$ rich or deficient and/or contains hazardous substances |
| | | | Ventilation provided to keep LEL below 10% |
| | | | Emergency equipment available where hazardous atmospheres could or do exist |
| | | | Safety harness and lifeline used |
| | | | Supplied Air necessary (if **Yes**, contact CHS prior to entry) |
| | | | **ENTRY & EXIT** |
| | | | Exit (i.e., ladder, sloped wall) no further than 25 feet from ANY employee |
| | | | Ladders secured, and extended 3 feet above the edge of the trench |
| | | | Wood ramps constructed of materials of uniform thickness, cleated together on the bottom. |
| | | | Employees protected from cave-ins when entering or exiting the excavation |

**Keep 1 copy of EACH Daily Checklist on site for the project duration**

*NOTE: Separate forms are required for each excavation.*

**ATTACHMENT 8**

Confined Space Entry Permit

O'BRIEN & GERE

ATTACHMENT 8

# Confined Space Entry Permit

File Name: 08_PERMIT_ConfinedSpace.doc
Revised: June 12, 2007

## GENERAL INFORMATION & HAZARD REVIEW

☐ **Permit-Required Confined Space Entry** ☐ **Alternate Entry Approach** ☐ **Non-Permit Space Designation**

| | | | |
|---|---|---|---|
| **Project Name:** | | **Project Number:** | |
| **Location of Work:** | | | |
| **Description of Confined Space:** | | | |
| **Description of Work to Be Performed:** | | | |
| **Special Safety Precautions to Be Observed:** | ☐ NONE or Specify: | | |

| **Potential Hazards - mark (☒) all that apply:** | ☐ **NO SERIOUS HAZARDS IDENTIFIED required for Non-Permit Space Designation** | ☐ **PHYSICAL HAZARDS ELIMINATED Identified by an * - required for Alternate Entry** |
|---|---|---|
| ☐ Decomposing organic matter - Low Oxygen | ☐ Sewer gas - Flammable from methane, toxic from hydrogen sulfide, Flammable & Toxic from illegally discharged chemicals. | ☐* Dangerous internal configuration |
| ☐ Rusting metal - Low Oxygen | ☐ Leaking underground fuel tanks infiltration into sewers, vaults, & pits - Flammable & Toxic | ☐* Falls >6' - Near unprotected edge or hole |
| ☐ Leaking nitrogen, carbon dioxide, helium, argon, & other inert gas lines - Low Oxygen | ☐ Welding/Torch Cutting - Toxic (carbon monoxide), Flammable (acetylene), & high or low Oxygen atmospheres | ☐* Loose materials such as sand, grain, & sawdust - Physical Hazard (engulfment) |
| ☐ Leaking natural gas, hydrogen, acetylene, propane, and other flammable gas lines - Flammable Atmosphere (high LEL) | ☐* Equipment energy sources - Physical hazards (shock, entanglement, moving parts) | ☐* Sudden changes to water flow or level - Physical Hazard (drowning) |
| ☐ Engine exhaust/burning - Carbon Monoxide (CO) | | ☐* Steam piping & hot surfaces - Physical hazards (thermal burns, obstruct vision) |
| ☐ Leaking process lines - Flammable and/or Toxic | | ☐ Other: |

## SAFETY CHECKLIST

| CHECK (✓) EACH QUESTION: YES or Not Applicable | YES | NA | CHECK (✓) EACH QUESTION: YES or Not Applicable | YES | NA |
|---|---|---|---|---|---|
| **1.** Has all equipment that could cause **electric shock** or injury from **moving parts** been **locked & tagged** by **each entrant**? | | | **7.** Are **cave-in**, **engulfment & drowning** hazards controlled? | | |
| **2.** Is **process piping** isolated and **locked & tagged** by each entrant per facility owner and/or O'Brien & Gere procedures? | | | **8.** Have precautions been taken to control **vehicle and pedestrian traffic** around the confined space entrance? | | |
| **3.** Has vessel/piping been **drained, cleaned or purged**? | | | **9. Rescue team** has been notified? | | |
| **4.** Has a **hot work permit** been issued and all fire prevention controls are in place? | | | **10. Emergency contact** number has been identified: ☐ **911** ☐ **Other:** | | |
| **5.** Can **sparks** ignite material in vicinity, sewers, lower floors? | | | **11. Communication** procedures between attendant & entrants have been reviewed: ☐ **Verbal** ☐ **Radio** ☐**Other:** | | |
| **6.** Has **fall protection** been provided for work above 6'? | | | **12.** | | |

## SAFETY EQUIPMENT

| CHECK (✓) ALL SAFETY EQUIPMENT NECESSARY | | | | | | (Minimum PPE - hard hat, safety glasses, and safety shoes) | |
|---|---|---|---|---|---|---|---|
| Goggles | | Rubber Boots | | Grounding Equipment | | Retrieval Equipment - tripod/winch | |
| Face Shield | | Half-face Respirator | | Non-sparking Tools | | Harness with Retrieval/Tether Line | |
| Un-coated Tyvek Suit | | Full-face Respirator | | Vapor/Explosion Proof Light | | **Ventilation Equip.-blower & duct (required for alternate entry)** | |
| Tychem QC Suit | | Air-line Respirator or SCBA | | Fire Extinguisher | | | |
| Tychem SL (Saranex) Suit | | Safety Belt/Harness | | Water hose | | | |
| Acid Suit | | Ladder/Scaffold | | Barricades & Signs | | | |
| Plastic Apron | | Lockout/tag out equipment | | Communication Equipment | | | |
| Nitrile or Vinyl Gloves | | GFCI | | Probing Staff (for water depth) | | | |

## AIR MONITORING

| Air Monitoring Equipment | Air Tests | Limits | Required? | Frequency | Results |
|---|---|---|---|---|---|
| | Oxygen | 19.5%-23% | ☐ **Y** ☐ **N** | ☐ initial only ☐ continuous | |
| | LEL | ≤10% | ☐ **Y** ☐ **N** | ☐ initial only ☐ continuous | |
| | CO | ≤35 ppm | ☐ **Y** ☐ **N** | ☐ initial only ☐ continuous | |
| | $H_2S$ | ≤10 ppm | ☐ **Y** ☐ **N** | ☐ initial only ☐ continuous | |
| | | | ☐ **Y** ☐ **N** | ☐ initial only ☐ continuous | |

**ENTRANT & ATTENDANT REVIEW & PRE-ENTRY BRIEFING for PERMIT-REQUIRED CONFINED SPACES**

**A pre-entry briefing is REQUIRED. Entrants and Attendants have been notified of hazards in the work area and have been instructed in the safety equipment and procedures necessary for safe entry by the Entry Supervisor. The briefing also includes a review of emergency evacuation procedures, communication procedures, this permit, and other safe work practices. Persons have been instructed to report any unsafe or unusual conditions.**

| | | | | | |
|---|---|---|---|---|---|
| **Entrant:** | print | sign | **Entrant:** | print | sign |
| **Entrant:** | print | sign | **Entrant:** | print | sign |
| **Entrant:** | print | sign | **Attendant:** | print | sign |
| **Entrant:** | print | sign | **Attendant:** | print | sign |

| **ENTRY SUPERVISOR / PERMIT AUTHORIZATION** | | | **PERMIT DURATION (1 shift maximum)** |
|---|---|---|---|
| **O'Brien & Gere:** | print | sign | **Entry Date:** _____/_____/_____ |
| **Subcontractor:** | print | sign | **Start Time:** _____:_____ |
| **Subcontractor:** | print | sign | **End Time:** _____:_____ **(permit expires)** |

**-- Keep 1 Copy On-Site For The Project Duration --**

**Upon completion of fieldwork, place expired permits into project files for record keeping and review during safety audits.**

**ATTACHMENT 9**

Hot Work Permit

O'BRIEN & GERE

ATTACHMENT 9

# Hot Work Permit

File Name: 09_PERMIT_HotWork.doc
Revised: June 11, 2007

| | | | |
|---|---|---|---|
| **Project Name** | | **Today's Date:** | |
| **Project Location:** | | **Project No.:** | |
| **Hot Work Location:** | | | |
| **Description of Hot Work Activities:** | | | |

**INSTRUCTIONS:**

1. Each hot work area will have a separate Hot Work Permit. Fire Watch is required unless in a designated "fabrication area."
2. O'Brien & Gere will review the permit with the subcontractor and sign if the permit is complete and precautions are identified.
3. Subcontractor will sign verifying that precautions on this permit are (or will be) in place prior to hot work.
4. Site personnel performing hot work covered by this permit will review the permit and print/sign in spaces designated for "Worker."
5. Fire Watch(s) for hot work covered by this permit will review the permit and print/sign in spaces designated for "Fire Watch."

| Yes | N/A | REQUIREMENTS WITHIN 35 FEET OF HOT WORK |
|---|---|---|
| ☐ | ☐ | Flammable liquids, dust, lint, and oily deposits are removed. |
| ☐ | ☐ | Explosive atmosphere in area is eliminated. |
| ☐ | ☐ | Combustible dust (wood, paper, grain, aluminum, magnesium, etc.) is removed from floors, beams, and other flat surfaces. |
| ☐ | ☐ | Combustible floors are wet down and/or covered with damp or fire-resistant tarps. |
| ☐ | ☐ | Combustibles are removed when possible or protected by fire-resistant tarps or non-combustible spark/slag shields. |
| ☐ | ☐ | All wall and floor openings are covered to prevent access by sparks and slag. |
| ☐ | ☐ | Fire-resistant tarps are suspended, or barriers installed, beneath work to catch falling sparks and slag |

| Yes | N/A | WORK ON WALLS OR CEILINGS |
|---|---|---|
| ☐ | ☐ | Wall or ceiling construction is noncombustible and without combustible covering or insulation. |
| ☐ | ☐ | Combustibles on the other side of walls are moved away or protected. |

| Yes | N/A | WORK ON ENCLOSED EQUIPMENT |
|---|---|---|
| ☐ | ☐ | Enclosed equipment is cleaned of all combustibles. |
| ☐ | ☐ | Containers have been purged of flammable liquids/vapors. |

| Yes | N/A | FIRE WATCH / HOT WORK AREA MONITORING |
|---|---|---|
| ☐ | ☐ | Fire Watch will be provided during hot work and for at least **30 minutes** after hot work, including any breaks. |
| ☐ | ☐ | **2-A:20-BC Type ABC dry chemical** fire extinguisher is provided or acceptable alternate - specify: _____ |
| ☐ | ☐ | Fire Watch understands how and when to call for **emergency support** and has a radio or cell phone to make the call. |
| ☐ | ☐ | Fire Watch understands the **P.A.S.S. approach** to using a fire extinguisher.<br>1. **PULL** Pull the pin. This will also break the tamper seal.<br>2. **AIM** Aim low, pointing the extinguisher nozzle (or its horn or hose) at the base of the fire. (Note: Do not touch the plastic discharge horn on $CO_2$ extinguishers, it gets very cold and may damage skin. )<br>3. **SQUEEZE** Squeeze the handle to release the extinguishing agent.<br>4. **SWEEP** Sweep from side to side at the base of the fire until it appears to be out. Watch the area. If the fire re-ignites, repeat steps 2 - 4. |

| HOT WORK PERMIT REVIEW | | | | | |
|---|---|---|---|---|---|
| **Worker:** | print | sign | **Worker:** | print | sign |
| **Worker:** | print | sign | **Worker:** | print | sign |
| **Worker:** | print | sign | **Fire Watch:** | print | sign |
| **Worker:** | print | sign | **Fire Watch:** | print | sign |

| HOT WORK PERMIT AUTHORIZATION | | | PERMIT DURATION (1 shift maximum) |
|---|---|---|---|
| **O'Brien & Gere:** | print | sign | Start: Date ____/____/____ Time _____:_____ |
| **Subcontractor:** | print | sign | |
| **Subcontractor:** | print | sign | Expires: Date ____/____/____ Time _____:_____ |

**ATTACHMENT 10**

Equipment-Specific Lockout/Tagout

O'BRIEN & GERE

ATTACHMENT 10

# Equipment-Specific Lockout/Tagout

File Name: 10_LOCKOUT.doc
Revised: June 22, 2007

| | | | |
|---|---|---|---|
| **Project Name:** | | **Date:** | |
| **Project Location:** | | **Job & Phase #** | |
| **Area/Process Name:** | | **Drawing Ref:** | |
| **Device Location:** | | | |
| **Device Description:** | | **I.D. or Label:** | |

| **PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR IMPLEMENTATION OF LOTO** **(Other PPE may be necessary based on work acitivities being performed)** | | | |
|---|---|---|---|
| □ Safety Glasses | □ Dust Goggles | □ Bib-style Splash Apron | □ Fall protection harness & Lanyard |
| □ Safety Shoes | □ Leather Gloves | □ Rain Suit (jacket & pants) | □ Slush Boots |
| □ Hard Hat | □ Surgical Gloves | □ Tyvek Coverall | □ Boot Covers |
| □ Face Shield | □ Chemical Gloves: | □ Polycoated Tyvek Coverall | □ Arc Flash PPE |
| □ Splash Goggles | | □ Saranax Coverall | □ Electrical Gloves |

| **LOTO INSTRUCTIONS** | | |
|---|---|---|
| | **Task Description** | **LOTO Equipment Needed** |
| **1** | | |
| **2** | | |
| **3** | | |
| **4** | | |
| **5** | | |
| **6** | | |
| **7** | | |
| **8** | | |
| **9** | | |
| **10** | | |

| **RE-START INSTRUCTIONS – Task Descriptions** | |
|---|---|
| **1** | |
| **2** | |
| **3** | |
| **4** | |
| **5** | |
| **6** | |
| **7** | |
| **8** | |
| **9** | |
| **10** | |

**ATTACHMENT 11**

Energized Electrical Work Permit

O'BRIEN & GERE

ATTACHMENT 11

# Energized Electrical Work Permit©

File Name: 11_PERMIT_EnergizedElectricalWork.doc
Revised: July 2, 2007

| ☐ Single Shift Only<br>☐ Extended Duration | Start Date: _____<br>Expiration Date: _____ | Permit # ____ | Work Area: |
|---|---|---|---|
| **Project Name:** | | | **Project Number:** |
| **Project Manager:** | | | |
| **Description of work to be done:** | | | |
| **Description of Circuit/Equipment:** | | | |
| **Justification for why equipment cannot be de-energized:** | | | |

## Results of Shock Hazard Analysis (NFPA-70E 2004 130.2) - See Table 1 on reverse side.

| Maximum Voltage: _____ | Limited Approach Boundary: __ ft __ in | Restricted Approach Boundary: __ ft __ in |
|---|---|---|
| | Prohibited Approach Boundary: __ ft __ in | |

## Results of Arc Flash Hazard Analysis (NFPA-70E 2004 130.3) - See Table 2 on reverse side.

Hazard Cat: __ | Flash Protection Boundary*: ☐ 4' ≤600v **OR** ☐ ____ ft for incident energy of _____ Cal/cm$^2$ at 18"

* For systems of 600 volts and less, the flash protection boundary is **4 feet**, based on an available bolted fault current of 50 kA (kiloamps) and a clearing time of 6 cycles (0.1 seconds) for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles. **For other fault currents and clearing times or voltages >600, see NFPA 70E.**

## PPE based on Shock and Arc Flash Hazard Analysis - See Table 2 on reverse side.

- ☐ **HAZ CAT 0** - All Natural Fiber Outerwear/Work Clothing
- ☐ **HAZ CAT 1** (ATPV ≥4) - Fire Retardant Clothing, Face Shield, Safety Glasses, Hard Hat
- ☐ **HAZ CAT 2** (ATPV ≥8) - Fire Retardant Clothing, Face Shield, Safety Glasses, Hard Hat
- ☐ **HAZ CAT 2*** (ATPV ≥8) - Fire Retardant Clothing, Balaclava (sock hood), Face Shield, Safety Glasses, Hard Hat
- ☐ **HAZ CAT 3** (ATPV ≥25) or **Haz Cat 4** (ATPV ≥40) - See attachment for specific PPE to be used.
- ☐ **ELECTRICAL GLOVES** - Class __ and Cut Resistant Outer Gloves
  **NOTE:** Inspect gloves and Check certification date. Refer to Table 2 to see which of the marked (☒) tasks specifically require "Gloves".

## Safety Checklist (Verify that proper controls are in place):

- ☐ Workers have **NFPA 70E training** and have full knowledge of equipment with which they are working.
- ☐ Remove all **jewelry and metal apparel**.
- ☐ **"Two-Person-Rule"** is required. Each person must be NFPA 70E-trained, have the same level of electrical PPE, have FA/CPR certification, be able to cut off all power sources, and be able to immediately notify emergency responders.
- ☐ **Electrical testing equipment** is required. ☐ 600 Volts / Category III (minimum) OR ☐ specify: Max Voltage _____ / Category _____ (III or IV)
- ☐ **Insulated tools** and equipment required. (Refer to Table 2 to see which of the marked (☒) tasks specifically require "Tools".)
- ☐ **Insulating barriers** are to be used to cover or shield exposed live parts.
- ☐ Use **barricades and warning signs** to prevent entry into the flash boundary by unauthorized persons.
- ☐ **Safety Attendant** is required to prevent entry by unauthorized persons. **Designated Attendant Name:** _____
- ☐ **Documented job briefing** including review of any job-specific hazards (Not required on extended duration permits after the initial briefing)
- ☐ See attachment for added information, special requirements, procedures, or written work plans.

## Approvals

| | |
|---|---|
| Electrical Supervisor: | Date: |
| Project Manager: | Date: |
| Division Officer or Safety Manager (extended duration permit only): | Date: |

## Authorized Workers that understand and agree to the above & have received a job briefing when required:

| Printed or typed name(s): | Signature(s) & Date(s): | Printed or typed name(s): | Signature(s) & Date(s): |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

O'BRIEN & GERE

ATTACHMENT 11

# Energized Electrical Work Permit©

File Name: 11_PERMIT_EnergizedElectricalWork.doc
Revised: July 2, 2007

## Table 1. Approach boundaries to live parts for shock prevention - Check (☒) the highest applicable voltage

| Nominal System Voltage Range (phase to phase) | Limited Approach Boundary | | Restricted Approach Boundary | Prohibited Approach Boundary |
|---|---|---|---|---|
| | Exposed Moveable Conductor | Exposed Fixed Circuit Part | | |
| ☐ **0 to 50 volts** | Not Specified | Not Specified | Not Specified | Not Specified |
| ☐ **51 to 300 volts** | 10 ft 0 in | 3 ft 6 in | Avoid Contact | Avoid Contact |
| ☐ **301 to 750 volts** | 10 ft 0 in | 3 ft 6 in | 1 ft 0 in | 0 ft 1 in |
| ☐ **751 to 15,000 volts** | 10 ft 0 in | 5 ft 0 in | 2 ft 2 in | 0 ft 7 in |

*Source:* From a portion of table 2-1.3.4, Approach Boundaries to Live Parts for Shock Protection (NFPA 70E *Standard for Electrical Safety Requirements for Employee Workplaces*). This reprinted material is not the complete and official position of the National Fire Protection Association on the referenced subject, which is represented only by the standard in its entirety. **See NFPA 70E for higher voltages.**

## Table 2. Hazard risk category classification (within flash protection boundary)- check (☒) all that apply

| Task Description | Haz Cat | Gloves | Tools |
|---|---|---|---|
| **Panelboards rated 240v & Below[1,3]** | | | |
| ☐ Circuit breaker (CB) or fused switch operation with covers on | 0 | N | N |
| ☐ CB or fused operation with covers off | 0 | N | N |
| ☐ Work on energized parts including voltage testing | 1 | Y | Y |
| ☐ Remove/Install CBs or fused switches | 1 | Y | Y |
| ☐ Removal of bolted covers to expose bare, energized parts | 1 | N | N |
| ☐ Removal of hinged covers to expose bare, energized parts | 0 | N | N |
| **Panelboards or Switchboards rated >240 V and up to 600 V with molded or insulated case circuit breakers[1,3]** | | | |
| ☐ CB or fused switch operation with covers on | 0 | N | N |
| ☐ CB or fused switch operation with covers off | 1 | N | N |
| ☐ Work on energized parts including voltage testing | 2* | Y | Y |
| **600 V Class Motor Control Centers (MCCs)[2 (except as Indicated),3]** | | | |
| ☐ CB or fused switch or starter operation with enclosure doors closed | 0 | N | N |
| ☐ Reading a panel meter while operating a meter switch | 0 | N | N |
| ☐ CB or fused switch starter operation with enclosure doors open | 1 | N | N |
| ☐ Work on energized parts including voltage testing | 2* | Y | Y |
| ☐ Work on control circuits with energized parts 120 V or below exposed | 0 | Y | Y |
| ☐ Work on control circuits with energized parts >120 V exposed | 2* | Y | Y |
| ☐ Insertion or removal of indiv. starter "buckets" from MCC[4] | 3 | Y | Y |
| ☐ Application of safety grounds after voltage test | 2* | Y | N |
| ☐ Removal of bolted covers to expose bare energized parts[4] | 2* | N | N |
| ☐ Opening hinged covers to expose bare energized parts | 1 | N | N |

| Task Description | Haz Cat | Gloves | Tools |
|---|---|---|---|
| **600V Class Switchgear w/ power circuit breakers or fused switches[5,6]** | | | |
| ☐ CB or fused switch or starter operation with enclosure doors closed | 0 | N | N |
| ☐ Reading a panel meter while operating a meter switch | 0 | N | N |
| ☐ CB or fused switch starter operation with enclosure doors open | 1 | N | N |
| ☐ Work on energized parts including voltage testing | 2* | Y | Y |
| ☐ Work on control circuits with energized parts 120 V or below exposed | 0 | Y | Y |
| ☐ Work on control circuits with energized parts >120 V exposed | 2* | Y | Y |
| ☐ Insertion or removal (racking) of CBs from cubicals, doors open | 3 | N | N |
| ☐ Insertion or removal (racking) of CBs from cubicals, doors closed | 2 | N | N |
| ☐ Application of safety grounds after voltage test | 2* | Y | N |
| ☐ Removal of bolted covers to expose bare energized parts | 3 | N | N |
| ☐ Opening hinged covers to expose bare energized parts | 2 | N | N |
| **Other 277 V - 600 V Class Equipment[3]** | | | |
| *Lighting or small power transformer* | --- | --- | --- |
| ☐ Removal of bolted covers to expose bare, energized parts | 2* | N | N |
| ☐ Opening hinged covers to expose bare, energized parts | 1 | N | N |
| ☐ Work on energized parts including voltage testing | 2* | Y | Y |
| ☐ Application of safety grounds after voltage test | 2* | Y | N |
| *Revenue Meters* | --- | --- | --- |
| ☐ Insertion/Removal | 2* | Y | N |
| ☐ Cable trough or tray cover removal or installation | 1 | N | N |
| ☐ Miscellaneous equipment cover removal or installation | 1 | N | N |
| ☐ Work on energized parts including voltage testing | 2* | Y | Y |
| ☐ Application of safety grounds after voltage test | 2* | Y | N |

1. Maximum of 25 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
2. Maximum of 65 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
3. For <10 kA short circuit current available, the hazard/risk category required may be reduced by one number.
4. Maximum of 42 kA short circuit current available, 0.33 second (20 cycle) fault clearing time.
5. Maximum of 35 kA short circuit current available, 0.5 second (30 cycle) fault clearing time.
6. For <25 kA short circuit current available, the hazard risk category may be reduced by one number.

**ATTACHMENT 12**

Accident Investigation Form

O'BRIEN & GERE

ATTACHMENT 12

# Incident Investigation Form

File Location: I:\Ogina\Admin\H&S\forms\INCIDENT_iNVESTIGATION.doc
Revised: January 15, 2008

| | | |
|---|---|---|
| *Corporate H&S to complete:* | ☐ **Restricted Workday ( __ days)** | ☐ **Near Miss** |
| ☐ **First Aid / Notification** | ☐ **Lost Workday ( __ days)** | ☐ **Property Damage >$1,000** |
| ☐ **Med. Treatment Only** | ☐ **Fatality** | ☐ **Other:** |

## PROJECT INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| **Client:** | | | | | |
| **Client Contact:** | | | | | |
| **Project Name:** | | | | | |
| **Project Address:** | | **State:** | | **Zip:** | |
| **Project Manager:** | | **Site Supervisor:** | | | |
| **Project Supervisor:** | | **Foreman:** | | | |
| **Project #:** | | **SSHC:** | | | |
| **Project Phone #:** | | **Today's Date:** | | | |

## INCIDENT INFORMATION

| | |
|---|---|
| **DATE and TIME (hrs) of Incident:** | |
| **Specific Location of Incident On-site:** | |
| **Supervisor at Time of Incident:** | |

☐ **NA** (✓ **if no injury**)

## INJURED PERSON INFORMATION

**(get written statement – bottom page 3)**

| | | | |
|---|---|---|---|
| **Name:** | | **Employment Status:** | |
| **Home Address:** | | ☐ Craft, Temporary, Contract ☐ *Other<br>☐ Regular Status Employee ☐ *Subcontractor<br>* Name of Company: | |
| **Home Phone #:** | | **O'Brien & Gere:** ☐ Eng ☐OGINA ☐OPS ☐ Limited<br>**Business Unit:** ☐ ENV ☐ CFS ☐ TWS ☐OPS ☐ Corp | |
| **Soc - Sec - Num:** | provide confidentially upon request | **Experience w/ OBG** | years months |
| **Gender:** | ☐M / ☐F **DOB:** | **Total Experience:** | years months |
| **Nature of Injury, and Part of Body:** | | | |
| **Treatment at Hospital or Clinic?** | ☐ No ☐ Yes – specify: | | |
| **Hospital/Clinic Street Address:** | | | |
| **Employee was Working:** | ☐ Alone ☐ With Crew or Fellow Worker (get witness names) | | |
| **Specific Task at Time of Incident:** | | | |
| **Occupation/Craft at Time of Incident:** | | | |

## WITNESS INFORMATION

**(get written statement – see page 4)**

| | | | |
|---|---|---|---|
| **Witness #1 Name:** | | **Contact Phone #** | |
| **Witness #2 Name:** | | **Contact Phone #** | |
| **Witness #3 Name:** | | **Contact Phone #** | |

**FULLY COMPLETE THIS FORM AND SEND TO THE MANAGER OF CORPORATE H&S (Jeff Parsons x2871) AND THE LEGAL/INSURANCE DEPARTMENT (Meg Hermann x2624) WITHIN 24 HOURS**
**Phone: (315) 437-6100 / Fax: (315) 463-7554**
**Attach All Applicable Medical Reports**

**cc:**

## DESCRIBE HOW THE INCIDENT OCCURRED

Describe in **detail**, and in chronological order, the events that lead to the accident, how the incident occurred, and any other facts you feel may be relevant to the investigation. Please avoid opinions or hearsay.

## CAUSAL FACTORS

Check all that apply and identify corrective actions for each factor. Beginning with the most apparent or most direct cause of the incident, **ask "WHY" five times** to identify the sequence of events or conditions that contributed to the incident.

**PROCEDURES**
- ☐ Not available
- ☐ Difficult to use / understand
- ☐ Use of procedure was not required but should be
- ☐ Followed Incorrectly
- ☐ Not followed
- ☐ Inadequate details
- ☐ Situation not covered
- ☐

**WORK ENVIRONMENT**
- ☐ Housekeeping poor
- ☐ Hot / Cold
- ☐ Poor lighting
- ☐ High Noise
- ☐ High Radiation/Contamination
- ☐ Cramped quarters
- ☐

**ENGINEERING/DESIGN**
- ☐ Inadequate technical design
- ☐ Inadequate specifications
- ☐ Inadequate change mgmt

**COMMUNICATION**
- ☐ Misunderstood verbal directions
- ☐ No communication or untimely
- ☐ Standard terminology or signals not used or are misunderstood
- ☐Interference from noisy environment
- ☐ Notifications late or not provided
- ☐ Job/task safety analysis not reviewed with personnel
- ☐

**EQUIPMENT & TOOLS**
- ☐ Wrong equipment/tool for the task
- ☐ Defective equipment/tools
- ☐ PM not done or inadequate
- ☐ Inadequate / removed guards
- ☐ Inadequate isolation (LOTO)
- ☐ No inspection of tools / equipment
- ☐
- ☐
- ☐
- ☐

**MANAGEMENT/ORGANIZATION**
- ☐ Inadequate work planning
- ☐ Unclear reporting relationship
- ☐ Unclear assignment of responsibility or authority
- ☐ Improper delegation
- ☐ Inadequate audits/inspections
- ☐ Inadequate incident reporting
- ☐ Inadequate incident investigation
- ☐ Corrective actions not complete
- ☐ Corrective actions inadequate
- ☐ Inadequate purchasing
- ☐ Wrong person assigned to job
- ☐ Lack of supervisor knowledge
- ☐ Inadequate/lack of safety mtgs
- ☐ Inadequate control of change
- ☐ Mgmt resources inadequate
- ☐ Excessive work hours (fatigue)
- ☐ No or Inadequate enforcement
- ☐ No pre-task safety analysis
- ☐
- ☐

**HUMAN FACTORS**
- ☐ Lack of experience or skill
- ☐ Infrequent performance
- ☐ Operating equipment without authority
- ☐ Operating equipment unsafely
- ☐ Taking unsafe position/posture
- ☐ Poor judgement or Inappropriate risk taking
- ☐ Physical impairment (explain)
- ☐ Drugs/alcohol (explain)
- ☐
- ☐

**TRAINING**
- ☐ Training not provided
- ☐ Training inadequate
- ☐ Did not attend training
- ☐ Training not appropriate for the job or task
- ☐
- ☐
- ☐

## CORRECTIVE ACTIONS

List the corrective actions taken to minimize the possibility of a similar incident from occurring in the future. Assign specific individuals and completion dates for each corrective action. The "Safety Audit Closeout" form can be used to help track completion of corrective actions or use the table below.

| # | Description | Responsible Person | Target Completion | Actual Completion |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Prepared by: (print)** | | **Sign:** | | **Date:** | |
| **CHS Review: (print)** | | **Sign:** | | **Date:** | |

## O'BRIEN & GERE EMPLOYEE INFORMATION RELEASE

**To be completed by O'Brien & Gere Employees requiring Hospital/Clinic Treatment or ANY Back Injury**

| | |
|---|---|
| **Employee Name:** | |
| **Date of Injury:** | |

**I hereby authorize O'Brien & Gere or any of its representatives to be furnished any information and facts regarding this injury, including reports and records, results and diagnosis, treatment and prognosis, estimates of disability, and recommendations for further treatment. This information is to be used for the purpose of evaluating and handling my claim for injury as a result of an incident occurring on or about the above-noted date of injury and for no other purpose, now or in the future.**

**O'Brien & Gere**
**Employee Signature:** _____ **Date:** _____

## EMPLOYEE & SUBCONTRACTOR INJURED PERSON STATEMENT

**To be completed by O'Brien & Gere Employees and Subcontractors for ALL Accident Reports**

**Please describe what happened with respect to the incident that occurred on _____ (date) at the following location, _____ .**

**Injured Person Signature:** _____ **Date:** _____

**Injured Person Name (print):** _____

## WITNESS STATEMENT

**Please describe what happened with respect to the incident that occurred on _____(date) at the following location, _____.**

**Company Name:** _____ **Phone #:** _____

**Witness Signature:** _____ **Date:** _____

**Witness Name (print):** _____

# *Appendices*

**APPENDIX A**

Pre-Work JSA Template

| | | | |
|---|---|---|---|
| **JSA Title:** | | **Client Name:** | |
| **Project Name:** | | **Client Project Manager:** | |
| **Project Number:** | | **OBG Project Manager** | |
| **Project Location:** | | | |
| **Project Phone No.:** | | **Prepared By:** | |
| **Project Fax No.:** | | **Revision Date:** | |
| **Scope of Work covered by this JSA (identify subcontractors covered by this JSA)** | | | |
| **Key Hazards (focus on highly hazardous tasks)** | | | |
| **Minimum Safety Equipment** | *(additional safety equipment may be required for specific hazards identified in the following sections)*<br>☐ Hard Hat ☐ Safety Glasses ☐ Safety Shoes ☐ Cut-Resistant Gloves ☐ Ear Protection<br>☐ Other (specify): | | |
| **Pre-Work Documentation & Certifications** | **Documentation and Certifications**<br>☐ Drug Testing ( ☐ alcohol testing is also required)<br>☐ Project Safety Plan or Job Safety Analysis (JSA)<br>☐ Client/Facility Contractor Safety Orientation<br>☐ Project/O'Brien & Gere Safety Orientation<br>☐ Other (describe below): | **To Be Submitted or Provided By…….** | |

## Individuals Must Sign a "Pre-Work Briefing Form" After Reviewing This JSA.

| HAZARD | | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| **ELEVATED WORK** | | |
| ☐ NA | FALLS > **6'** or within **15'** of a ROOF OR MEZZANINE EDGE where the fall is >6' | ☐ Existing Guardrails ☐ Hole Covers Marked "HOLE" ☐ Fall Restraint<br>☐ Temporary Guardrails ☐ Manlifts used for elevated work ☐ _____<br>☐ Warning Line 15' from Edge ☐ Fall Arrest w/ harness/lanyard (identify tie-off points)<br>**Fall Protection Comments (describe equipment used):** |
| ☐ NA | LADDERS / STAIRS<br>☐ Extension Ladders<br>☐ Step Ladders<br>☐ Fixed Ladders<br>☐ Stairs | ☐ Employees training in safe ladder use at toolbox safety meeting<br>☐ Extension ladders are properly footed, secured at top, and setup at proper angle<br>☐ Stepladders are set on level ground or properly shimmed with spreaders locked.<br>☐ Stairs have proper rise over run and stairs >4 steps or 4' have guardrails.<br>**LADDERS/STAIRS COMMENTS:** |
| ☐ NA | SCAFFOLD<br>Type: _____ | ☐ Scaffolds erected and inspected under supervision of competent person:<br>**Competent Person:** _____ **Company:** _____<br>☐ Toprail and midrail provided on scaffolds >10' (otherwise specify other fall protection)<br>☐ Work platforms are at least 18" wide & made of scaffold lumber or cleated aluminum planks.<br>☐ Scaffolds placed on mud sills, pavement, concrete or other solid surface |

| HAZARD | | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| | | **SCAFFOLD COMMENTS:** |
| ☐ NA | MANLIFT used to reach work<br>☐ Scissor Lift<br>☐ Extensible Boom<br>☐ Articulated Boom<br>☐ vertical Lift ("Genie") | ☐ Operators are sufficiently trained, experienced and qualified.<br>☐ Equipment is inspected after mobilization and is in good condition.<br>☐ Harness & Lanyard worn whenever operating the lift (scissor lifts may be excepted)<br>☐ Overhead and surface obstructions are reviewed with operators prior to use.<br>**MANLIFT COMMENTS:** |
| **EXCAVATIONS / TRENCHING** | | |
| ☐ NA | ☐ Max Depth ≥ 20'<br>☐ Max Depth ≥ 5'<br>☐ Max Depth <5' with potential cave-in hazard<br>☐ Potential permit-required confined space at depth ≥ 4'<br>☐ Underground utilities<br>☐ Structures/foundations<br>☐ Falls into excavations<br>☐ Other: | ☐ Sloping & shoring for excavations ≥20' are approved by a professional engineer<br>☐ Sloping & shoring for excavations ≥5' when persons are exposed to cave-in. (specify below)<br>☐ Sloping & shoring for shallow (<5') excavations with cave-in hazard (specify below)<br>☐ Excavations ≥ 4' are classified as a non-permit confined space<br>☐ Excavations ≥ 4' are classified as Alternate Entry or Permit-Required (see confined space)<br>☐ Underground utilities have been identified and marked.<br>☐ Local "dig safe" organization has been notified for utility locations in public areas or rights of way. Number: _____ Date: _____<br>☐ Hand digging within 3' of utility locations.<br>☐ Excavations are protected by perimeter fencing (not barricade tape):<br>(☐ rigid fence - chain link or wood ☐ safety fence 6' from edge.)<br>**EXCAVATION COMMENTS:** |
| **CONFINED SPACES** | | |
| ☐ NA | ☐ No Serious Hazards<br>☐ Toxic Atmosphere<br>☐ carbon monoxide<br>☐ hydrogen sulfide<br>☐<br>☐ Flammable Atmosphere<br>☐ Low Oxygen<br>☐ Combustible dust<br>☐ Other Serious Hazard: | ☐ Confined space is altered so that it is no longer a confined space. (describe below)<br>☐ Confined space is downgraded to a non-permit confined space. (identify which spaces below)<br>☐ Alternate Entry is used. (Identify which space qualify for confined space entry below)<br>☐ Full permit-required confined space entry is used due to presence of serious hazards.<br>☐ Rescue team has been notified (☐ Paid FD ☐ Volunteer FD ☐ Plant Rescue)<br>Rescue Team:_____Phone Number: _____<br>☐ All entrants and attendants for Alternate Entry and Permit-Required Entry have confined space entry training.<br>**CONFINED SPACE COMMENTS:** |
| **LOCKOUT-TAGOUT / ELECTRICAL** | | |
| ☐ NA | Maintenance, construction, or modification of processes and equipment with POTENTIAL UNEXPECTED RELEASE OF ENERGY. Identify energy types:<br>☐ Electrical | ☐ System owner (client) will lockout equipment following their procedures and O'Brien & Gere will "co-lock" equipment to prevent premature startup by owner or subcontractors.<br>☐ OBG to develop and implement lockout procedures for equipment under OBG control:<br>☐ equipment-specific de-energization and lockout procedure (required for O&M) OR<br>☐ de-energization and lockout devices are identified below<br>☐ Group lock box will be used with all persons working on equipment attaching their own lock(s) and tag(s). Location of lock box: _____ |

| HAZARD | | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| | ☐ Pressurized liquid piping<br>☐ Compressed gas / steam<br>☐ Moving Parts<br>☐ Hydraulic systems<br>☐ Chemical release<br>☐<br>Describe Equipment requiring lockout:_____<br>_____<br>_____ | ☐ Equipment or process components will be individually locked with all persons working on equipment attaching their locks and tags directly on equipment.<br>**LOCKOUT COMMENTS:** |
| ☐ NA | OVERHEAD POWER LINES<br>_____ KV<br>_____ ft above ground<br><br>_____ KV<br>_____ ft above ground | ☐ Request to de-energize lines will be submitted for work within 20' of power lines.<br>Request sent to: _____ Date: _____<br>☐ No one will be permitted to work <10' to power lines without lines being de-energized.<br>☐ Project persons are informed of 20' safety zone around energized power lines.<br>☐ Project persons are informed of additional restrictions required when working ≤20' but >10':<br>☐ Dedicated spotter for all elevated work or operation of equipment that can contact lines<br>☐ Barricades setup at 20' from base of power lines to establish a "restricted work area."<br>☐ "Power Line Safety Permit' required to work within 20' of power lines.<br>☐ Power lines are shielded and/or marked with high visibility material<br>**POWER LINE COMMENTS:** |
| ☐ NA | ARC FLASH<br>Location: _____<br>Voltage: _____ | ☐ Electrical equipment evaluated for arc flash potential by a qualified person.<br>☐ Persons with potential arc flash exposure are properly trained and equipped with electrically rated gloves, face shield, coveralls, etc.<br>☐ Non-essential personnel will be kept clear of all areas affected by arc flash<br>☐ Plant fire protection dept., safety dept, and emergency responders will be notified.<br>**ARC FLASH COMMENTS:** |
| **HEAVY EQUIPMENT (other than cranes)** | | |
| ☐ NA | Struck By, Run-Over, Caught In Between (pinch points), Roll Over, Fluid Leaks<br>☐ Bulldozer<br>☐ Excavator<br>☐ Front Loader<br>☐ mini Skid Steer (bobcat)<br>☐ mini Excavator<br>☐ Dump Truck<br>☐ Drill/Boring Rig<br>☐ Lull / Material Handler<br>☐ Forklift<br>☐<br>☐<br>☐ Manlift - specify type(s): | ☐ Qualified persons operate all heavy equipment. Qualifications were determined by:<br>☐ License or certificate (required for forklift and lull operators).<br>☐ "Good-Guy Letter" on company letterhead or email with company email address.<br>☐ Equipment will be inspected upon mobilization by:_____.<br>All leaks or defective safety equipment will be repaired before use.<br>☐ Operators will be reminded of seatbelt use by: _____<br>☐ High visibility vests are required for: _____<br>☐ Operators will review manufacturer's safety guidelines for all equipment operated on slopes. Max. safe slope for each vehicle: _____<br>☐ Counterweight swing radius will be barricaded.<br>☐ Operators and helpers will maintain a safe distance to moving parts. All those working near moving or rotating parts will secure loose hair, clothing, and equipment.<br>☐ Fall protection will be worn by all those in manlifts (scissor lifts are excepted: ☐ Yes ☐ NO)<br>☐ Drill rigs will only be moved with masts lowered. Masts will be erected with outriggers fully extended when equipped with outriggers.<br>☐ Rigging directly to the forks of a lull, forklift, or front loader equipped forks is prohibited. Crane hook attachments will be used |

| | HAZARD | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| | | (specify):_____<br>☐ Spill equipment is available for fuel and hydraulic fluid leaks. Location: _____<br>**HEAVY EQUIPMENT COMMENTS:** |
| **HOT WORK / WELDING / CUTTING** | | |
| ☐ NA | Fire, explosion, burns, UV flash, fume, gases<br>☐ Welding - Specify:<br>base metal:_____<br>electrode:_____<br>Shield gas:_____<br>☐ Oxy/Acetylene Cutting<br>base metal:_____<br>☐ Soldering/Brazing<br>☐ Grinding<br>☐ | ☐ O'Brien & Gere will issue hot work permit. Name:_____<br>☐ The site owner will issue hot work permits. Name: _____<br>☐ Hot work permits are visibly posted. Location(s):_____<br>☐ Fire watches are identified by name and remain _____ minutes after hot work (min of 30).<br>☐ A 20 lb ABC fire extinguisher will be placed within 25' of hot work or as directed on permit.<br>☐ Painted surfaces have been evaluated for lead content by: ☐NA _____<br>☐ Insulation has been evaluated for asbestos content by: ☐NA _____<br>☐ Pedestrians and adjacent workers will be protected from UV Flash by _____<br>☐ Sparks and slag will be prevented from falling through floor and wall openings.<br>☐ Air monitoring will be conducted in hazardous areas. Haz Material:_____<br>Areas to be Tested:_____<br>☐ Oxygen and acetylene cylinders will be separated by 20' when not used within 24 hours.<br>☐ All compressed gas cylinders in storage will be secured upright and capped.<br>☐ Face shields will be used for all grinding, cutting, and welding work.<br>**HOT WORK COMMENTS: (Identify areas or tasks requiring hot work permits.)** |
| **POWER TOOLS, HAND TOOLS, and EXTENSION CORDS** | | |
| ☐ NA | eye injury, hand/arm cuts, electrical shock, strains, foot injuries, dust<br>☐ Grinders<br>☐ Jackhammer/Chip hammer<br>☐ Needle Gun<br>☐ Explosive Actuated (Hilti)<br>☐ Chop saw<br>☐ Chain saw<br>☐ concrete/asphalt saw<br>☐<br>☐<br>☐ | ☐ All tools and electrical cords will be inspected upon mobilization by:_____<br>☐ All tools and electrical cords in-use will be inspected daily by:_____<br>☐ GFCIs will be used on all extension cords and 120v power tools.<br>☐ Grinder speeds will not exceed grinding wheel ratings.<br>☐ Jackhammers will not be used in a horizontal position without mechanical support.<br>☐ Only properly trained users will operate explosive-actuated tools. Identify user names and training dates: ___ _____<br>☐ Water or wet cutting performed to control dust<br>☐ Respirators used to prevent exposure to dust (respirator type:_____)<br>☐ Face shield and safety glasses used (required for all grinders, jackhammers, chain saws, etc)<br>☐ Kevlar chaps and jacket (required for all chainsaw work)<br>☐ Hearing protection required for which tools or areas: _____<br>_____<br>☐ All extension are in good condition with no cuts through outer insulation, ground plugs are present, and no "vinyl tape" repairs. (Only 12 gauge extension cords may be repaired.)<br>**TOOL & CORD COMMENTS:** |
| **MANUAL MATERIAL HANDLING / MATERIAL STORAGE / HOUSEKEEPING** | | |
| ☐ NA | back or shoulder strain, struck by falling objects, trips and falls, incompatible materials | ☐ Mechanical lifting equipment used to reduce manual material handling:<br>(☐ Forklift/Lull ☐ Heavy Equipment ☐ Chain-fall ☐_____)<br>☐ Manual lifting more than 75 lbs by a single person will be avoided. |

| HAZARD | | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| | (fire or explosion)<br>☐ hvy manual lifting (>50 lbs)<br>☐ chemical storage<br>☐ compressed gas storage<br>☐ Tall storage greater than 2 pallets stacked.<br>☐ Material & equipment laydown areas<br>☐ Trash & debris removal<br>☐ Temporary cords & hoses placed across walkways<br>☐<br>☐<br>☐ | ☐ Good manual lifting techniques will be reviewed with the following trades/persons prior to site work: _____<br>☐ Incompatible chemicals will be separated by 20' or a concrete block wall.<br>☐ Secondary containment will be provided for the following chemicals: _____<br>_____<br>☐ Safety equipment will be located near chemical storage.<br>☐ Spill Kit ☐ Emergency Shower ☐ Eyewash ☐ Drench Hose ☐ Splash PPE<br>☐ Flammable gases and oxygen will be separated by 20'.<br>☐ All compressed gas cylinders will be transported vertically and secured upright.<br>☐ Equipment and materials will be stacked in laydown areas with aisles as necessary for safe access. All un-used equipment & materials will be returned to laydown areas daily. Designated laydown areas:_____<br>☐ Materials will not be stacked greater than 2 pallets high without being secured.<br>☐ Trash and debris will be removed daily and placed in designated containers. Specify debris segregation and location of disposal containers below.<br>☐ Hoses & Cords will be run out of walkways (e.g., within 6" of walls or 7.5' overhead) whenever possible or will be clearly marked by cones or barricades.<br>**MATERIAL HANDLING & HOUSEKEEPING COMMENTS:** |
| **TRAFFIC & SIDEWALK OBSTRUCTION** | | |
| ☐ NA | ☐ Vehicle accidents<br>☐ Pedestrians struck by vehicles or heavy equipment<br>☐ Pedestrians falls<br>☐ Pedestrian struck-by falling objects | ☐ DOT signal devices will be used to re-route vehicles around excavations or busy site entrances/exits that affect road traffic.<br>☐ Flaggers will be used and have DOT Flagger Training<br>☐ Pedestrian traffic will be safely routed around or over excavations.<br>☐ Pedestrian traffic will be safely routed around or under overhead work.<br>**TRAFFIC & SIDEWALK COMMENTS:** |
| **CRANES & RIGGING** | | |
| ☐ NA | tip-over, struck-by dropped loads,<br>Crane Make:_____<br>Crane Model:_____ | ☐ Operator is qualified: ☐ CCO ☐ State License ☐ "Good-Guy" Letter<br>☐ Lifting & Rigging Plan will be prepared by: Company Name:_____<br>☐ No Lifting & Rigging Plan is required - crane work is not critical and not in a hazardous area.<br>☐ Annual crane maintenance certification within last 12 months. Date:_____<br>☐ Periodic crane inspection within 30 days. Date:_____<br>☐ Site owner notified by: Name:_____ Date: _____<br>**CRANES & RIGGING COMMENTS:** |
| **STEEL ERECTION** | | |
| ☐ NA | structural collapse<br>(falls, hot work, cranes, and rigging are covered elsewhere in this JSA) | ☐ Written "notice to proceed" will be sent to the steel erection sub. Date:_____<br>☐ Written notice of any bolting or rod modifications made by after drawings were "issued for bid" to the steel erection sub. Date(s):_____<br>**STEEL ERECTION COMMENTS:** |

| HAZARD | | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|---|
| **CONCRETE / MASONRY** | | |
| ☐ NA | struck by injury, trips & falls, cuts from rebar, skin burns from contact with concrete<br><br>(concrete saw, jackhammers, fall protection, heavy equipment are covered elsewhere in this JSA) | ☐ All rebar ends <6' must be protected by rebar caps<br>☐ Only authorized persons will be allowed to walk on rebar pads to minimize the number of persons at risk of tripping or falling.<br>☐ Concrete truck operator will be instructed to take direction only from the concrete worker who is handling the discharge chute/hose when related to moving the discharge chute/hose.<br>☐ Finishers, masonry workers, & others who must kneel extensively will be provided kneepads.<br>☐ Temporary steps will be provided for all elevation changes ≥18".<br>**CONCRETE MASONRY COMMENTS:** |
| **BIOLOGICAL HAZARDS (Pre-Work Site Surveys and Inspections, Clearing and Grubbing, Caretaking Services)** | | |
| ☐ NA | Infection, Lyme Disease, West Nile Virus, Eastern Equine Encephalitis (EEE), Severe Rash, Allergic Reaction, Venom effects<br><br>☐ Ticks<br>☐ Mosquitoes (EEE, WNV, etc)<br>☐ Venomous Snakes<br>☐ Venomous Spiders<br>☐ Poison Ivy, Oak, or Sumac<br>☐ Bees & Wasps<br>☐ Fire Ants<br>☐ Other (identify below): | ☐ Use **DEET** (25%-98%) repellent on skin for protection against mosquitoes, ticks, and similar insects. Use higher concentrations for heavily infested areas.<br>☐ Use **Permethrin** repellent on clothing in areas heavily infested with ticks, chiggers, etc.<br>☐ All site personnel will be instructed on how to **identify poison ivy, sumac, and oak**. (O'Brien & Gere Field Identification Guide or equiv. has been posted? ☐ YES ☐ NO)<br>☐ Poison ivy **barrier creams** (e.g., Ivy Block) will be used on exposed skin prior to the workday.<br>☐ Poison ivy **neutralizing wipes or rubbing alcohol** will be used on hands and exposed skin following work activities or incidents where contact with poison ivy/oak/sumac is suspected.<br>☐ **Protective coveralls** (such as Tyvek™) will be used to prevent contact with ticks or poison ivy.<br>☐ All site personnel will be instructed on how to **identify venomous snakes** indigenous to the area. List venomous snakes of concern in the "Comments" section below. (O'Brien & Gere Field Identification Guide or equiv. has been posted? ☐ YES ☐ NO)<br>☐ All field personnel with a potential to **encounter venomous snakes** will wear:<br>☐ Snake Chaps AND/OR ☐ High Leather Safety Boots (NOT ankle-high boots/shoes)<br>☐ All site personnel will be instructed on how to identify **venomous spiders** indigenous to the area. List venomous spiders of concern in the "Comments" section below. (O'Brien & Gere Field Identification Guide or equiv. has been posted? ☐ YES ☐ NO)<br>☐ Site personnel with known **allergies** to bee/wasp stings, fire ant bites, or other insect bites carry an "EpiPen" or equivalent medication prescribed for treating allergic reaction.<br>**BIOLOGICAL HAZARDS COMMENTS:** |
| **ENVIRONMENTAL HAZARDS / HAZARDOUS WASTE SITE WORK** | | |
| ☐ NA | Exposure to hazardous vapors or dust, contact with contaminated materials, fire, explosion.<br><br>Contaminants of Concern and hazardous chemicals include:<br>☐ volatile organic compounds<br>(describe:_____ | ☐ Site workers with a potential for contact with contaminated materials and work in Level C PPE will have OSHA 40-hour training, current 8-hour refresher, and medical exam.<br>☐ Site workers with minimal contact with contaminated materials and no work in Level C PPE will have OSHA 40-hour or 24-hour training, current 8-hour refresher, and medical exam.<br>☐ Foremen or Supervisors overseeing field crews will have 8-hour OSHA Supervisor training.<br>☐ No intrusive work activities or areas are anticipated with current scope of work.<br>☐ Intrusive work activities include: _____<br>_____<br>_____ |

| HAZARD | HAZARD CONTROLS (check all that apply and comment as required) |
|---|---|
| _____)<br>☐ semivolatile organic cmpds<br>(describe:_____<br>_____)<br>☐ metal dusts<br>(describe:_____<br>_____)<br>☐ PCBs<br>☐ Caustic (NaOH)<br>☐ Acid (H2SO4, HCL)<br>☐<br>☐<br><br>(many other hazardous waste site hazards are covered elsewhere in this JSA) | ☐ The perimeter of intrusive work areas are identified by:_____<br>☐ Decontamination of personnel or equipment is <u>not</u> anticipated with the current scope of work.<br>☐ Decontamination of personnel and small tools will be conducted as follows: _____<br>_____<br>_____<br>☐ Decontamination of heavy equipment will be conducted as follows: _____<br>_____<br>_____<br>☐ Heavy equipment leaving the site will be inspected by: _____<br>☐ Work area monitoring is not anticipated with the current scope of work.<br>☐ Work area air monitoring will be conducted per attached air monitoring plan & action levels.<br>☐ Work Area Air Monitoring as follows for: ☐ Dust, ☐VOCs, ☐Other:_____ |

| Action Levels | Description & Response Actions |
|---|---|
| | 1. <u>Level C PPE</u> - Tyvek, boot covers, nitrile gloves, half or full face w/ respirator with _____ cartridges changed (☐ daily, ☐ _____) OR<br>2. Reduce contaminant concentrations below action level(s). |
| | 1. <u>Level B PPE</u> - Same as above except with a supplied air respirator OR<br>2. Reduce contaminant(s) below Level B action level(s). |
| | 1. STOP work |
| | |

☐ Community Air Monitoring is not anticipated with the current scope of work.
☐ Community Air Monitoring is required per the attached air monitoring plan & action levels.
☐ **Community Area Air Monitoring** as follows for: ☐ Dust, ☐ VOCs, ☐ Other:_____
(**NOTE** - Insert additional or revise existing response actions as appropriate)

| Action Levels | Description & Response Actions |
|---|---|
| | 1. If dust or odors are observed leaving the site perimeter, then dust/odor controls must be implemented.<br>2. If dust/odor controls fail to prevent dust/odor emissions from leaving the site, then **STOP** work and notify the client contact. |
| | 1. Use dust/odor suppression techniques outlined in the "Comments" section.<br>2. Evaluate additional techniques or controls if necessary.<br>3. Notify the client contact. |
| | 1. STOP work |
| | |

**ENVIRONMENTAL & CHEMICAL HAZARD COMMENTS:**

| |
|---|
| **EMERGENCY RESPONSE** |
| **(911 Service is Available** ☐ Yes ☐ No **Cell Phone Required** ☐ Yes ☐ No) |
| **Alternate Emergency Number (if not "911"):** |
| **Site Address:** |
| **Muster Point** in case of site evacuation: |

| HAZARD | HAZARD CONTROLS (check all that apply and comment as required) | | |
|---|---|---|---|
| **Emergency Medical** Treatment - Hospital Name:<br>Hospital Address: | | **Number:** | |
| **Non-Emergency Med**. Treatment - Clinic Name:<br>Occupational Clinic Address: | | **Number:** | |
| **Fire Department** Name | | **Number:** | |
| **Spill** Response: | | **Number:** | |
| **Client** Representative Name:: | | **Office Number:**<br>**Cell Number:** | |
| O'Brien & Gere **Project Manager** Name: | | **Office Number:**<br>**Cell Number:** | |
| O'Brien & Gere **Corporate H&S** Name: | | **Office Number:**<br>**Cell Number:** | |
| Contact Name: | | **Office Number:**<br>**Cell Number:** | |
| Contact Name: | | **Office Number:**<br>**Cell Number:** | |

**EMERGENCY RESPONSE COMMENTS:**

1. Upon occurrence of any injury, fire, explosion, major spill (beyond incidental), property damage >$1,000, or near-miss that could have resulted in a fatality or disabling injury, **IMMEDIATELY NOTIFY** the O'Brien & Gere Project Manager, O'Brien & Gere Manager of Corporate H&S, and the Client Representative.
2. Complete an *Incident Report* within **24 hours** and submit to the O'Brien & Gere Manager of Corporate H&S for review.
3. First Aid and CPR supplies are located: _____
4. Spill Supplies are located: _____.
5. Emergency numbers and Hospital Route Map are posted: _____.

**< Insert Hospital Map and Directions Here >**

Individuals who are performing work covered by this JSA have received a **project-specific safety orientation** that includes a review of the safety requirements outlined in this JSA. The undersigned individuals acknowledge that have read this JSA and/or reviewed this JSA with the Project Supervisor, Superintendent, or Foreman and agree to comply with safety requirements outlined herein. The undersigned individuals understand that these safety requirements are not "all-inclusive" and that I will be expected to follow any additional safe work practices applicable or customary to my specific scope of work or trade.

| Print Name | Signature | Company | Date |
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